

**Is Breastfeeding Truly Free?**  
**The Economic Consequences of Breastfeeding for Women**

**by**

**Phyllis L. F. Rippeyoung<sup>\*</sup>, Ph.D.**

**Acadia University**

**&**

**Mary C. Noonan, Ph.D.**

**The University of Iowa**

---

<sup>\*</sup> Send comments to Dr. Phyllis Rippeyoung, Department of Sociology, Acadia University, 10 Highland Ave., Wolfville, NS, B4P 2R6, Canada or [phyllis.rippesyoung@acadiu.ca](mailto:phyllis.rippesyoung@acadiu.ca)

## Abstract

Research has clearly demonstrated that income and work status are two strong predictors of whether or not a mother breastfeeds her child: income has a positive effect and work status has a negative effect on the odds of a woman breastfeeding versus formula feeding her child. However, the effect of breastfeeding on women's employment outcomes is largely unknown. Since breastfeeding is currently less compatible with work than formula feeding, women who breastfeed their children may be more likely to take an extended maternity leave, reduce their work hours after childbirth, or quit work entirely. These strategies will potentially lead to lower earnings in the short-term and may also affect long-term economic prospects by reducing mothers' prospects for promotions or raises. Using both random-effects and fixed-effects regression techniques, we use the National Longitudinal Survey of Youth to see if breastfeeding has an impact on mothers' work outcomes after childbirth.

## Introduction

Breastfeeding has been promoted as “best” for babies and mothers by the American Academy of Pediatrics (AAP 2005), the World Health Organization (2003), the U.S. Department of Health and Human Services (2000), and in most parenting manuals, magazines, and guides (Kukla 2006; Law 2000; Wall 2001; Wolf 2007). Overall, compared with formula-feeding, breastfeeding is argued to be simpler, safer, healthier, and, for the most part, cost free (Barber-Madden, Petschek, and Pakter 1987; US DHHS 2000). Based on results of hundreds of studies, numerous organizations, agencies, and parenting experts argue that breastfeeding provides, among other things, benefits for infant health, infant intelligence, and mother-child bonding. And so, health experts encourage mothers to exclusively breastfeed their babies for at least the first six months of their infants’ lives<sup>1</sup>.

On the whole, previous research on breastfeeding has focused on two main areas: (1) identifying the barriers to breastfeeding (e.g., Barber-Madden, Petschek, and Pakter 1987; Cohen and Mrtek 1994; Van Esterik and Greiner 1981) and (2) identifying the benefits of breastfeeding for children and their mothers (for a review, see AAP 1997). In the research which examines the relationship between women’s work behaviors and breastfeeding, the causal relationship between women’s work-related characteristics and breastfeeding has been examined almost exclusively by assessing the effect of women’s work characteristics (i.e., work status, hours, and earnings) on the likelihood of breastfeeding (e.g. Gielen et al. 1991; Visness and Kennedy 1997).

However, it is plausible that the relationship between breastfeeding and women’s work status also operates in the opposite direction. Particularly considering that, temporally, the act of breastfeeding a newborn precedes a mother’s return to work after childbirth, it seems plausible that, compared to a mother who formula feeds her child, a mother who breastfeeds her child may be more likely to leave paid employment, either partially or fully, or be more likely to switch to a “family-friendly” job in order to accommodate breastfeeding (Reynolds 2005). These modifications in work behavior may, in turn, lower the breastfeeding mother’s current and future earnings. Furthermore, a mother who combines breastfeeding and paid work may be viewed by her employer as less committed and productive than

---

<sup>1</sup> The new breastfeeding policy statement of the American Academy of Pediatrics encourages women to breastfeed for at least a year (AAP 1997, 2005) and The World Health Organization (2003) promotes breast-feeding until age 2 and beyond.

another, similar employee who formula feeds her child. Poor annual evaluations and blocked mobility could follow for the breastfeeding mother. Although these scenarios seem plausible, no research has empirically examined how breastfeeding influences the short or long-term work outcomes of women.

In this paper, we address this gap in the literature using the National Longitudinal Survey of Youth (NLSY) to address the following questions: (1) Compared to mothers who formula feed, are mothers who breastfeed more likely to quit work or take longer maternity leaves following childbirth? (2) Among mothers who return to work following childbirth, do those who breastfeed reduce their work hours post-birth more than those who formula feed? (3) Compared to formula feeders, are breastfeeders more likely to switch to “family friendly” employers following childbirth? (4) Among mothers who return to their pre-birth jobs and pre-birth hours following childbirth, do breastfeeders have a “flatter” earnings trajectory compared to formula feeders over time?

Because of the massive push in the public health community to get mothers to breastfeed, understanding the economic consequences of breastfeeding on women’s lives is essential. Should breastfeeding be shown to have a non-negative impact on women’s work outcomes, our study will provide further evidence for why breastfeeding should be encouraged and supported. Should breastfeeding be shown to have a negative impact on work outcomes, our study will provide evidence that breastfeeding promotion needs to be coupled with protections for women’s work and earnings. Additionally, this research will provide further fuel for feminist debates regarding the implications of breastfeeding for women’s liberation.

## Review of the Literature

The majority of prior research in this area has been based on the assumption that breastfeeding is a positive in the lives of infants, women, and communities (AAP 1997; AAP 2005; Law 2000; Wolf 2007; US DHHS 2000). For the most part, breastfeeding is treated as a dependent variable to pinpoint who needs to be targeted with appeals to breastfeed or as an independent variable, with health of the child, and occasionally health of the mother, as the primary dependent variables. In terms of the economics of breastfeeding, most of the research examines either differences in the class and occupational locations of breastfeeders and non-breastfeeders or the potential cost savings in breastfeeding for parents and for society; almost no research examines potential negative economic consequences of breastfeeding for working women.

### *Economic Predictors of Breastfeeding*

In an effort to try to understand the barriers to breastfeeding, a large body of research has identified the economic characteristics of mothers related to the initiation and duration of breastfeeding. Research has found that poor, less educated non-professional working women are less likely to breastfeed compared to non-poor, more educated and professional or unemployed women (Arlotti, Cottrell, Lee, Curtin 1998; Auerbach and Guss 1984; Berger, Hill and Waldfogel 2005; Blum 1999; Chatterji and Frick 2005; Chuang et al. 2007; Chen, Yi Chun, Wu, and Chie 2006; Fein and Roe 1998; Gielen et al. 1991; Haider, Jacknowitz and Schoeni 2003; Hawkins et al. 2007; Khoury, et al. 2005; Kimbro 2006; Kurinij et al. 1988; Kurinij et al. 1989; Lindberg 1996; Ong 2005; Roe, Whittington, Beck Fein, and Teisl 1999; Ryan et al. 2006; Simard, et al. 2005; Van Esterik and Greiner 1981; Visness and Kennedy 1997; Wagner, Wagner, and Hulsey 2000). Overall, professional women or stay-at-home mothers in households with higher incomes are far more likely to breastfeed than lower income, working women (i.e., higher income professional women are “selected” into breastfeeding).

### *Economic Benefits of Breastfeeding*

To support the call for breastfeeding promotion, a number of studies have assessed the cost savings from breast rather than formula feeding. For instance, the U.S. “HHS Blueprint for Action on Breastfeeding” (2000) cites Montgomery and Splett (1997) to argue that “Families can save several hundred dollars over the cost of feeding breast milk substitutes, even after accounting for the costs of

breast pump equipment and additional food required by the nursing mother” (11). Relatedly, Ball and Bennett (2001), Ball and Wright (1999) and Hoey and Ware (1997) have extrapolated from their results, showing better health for breastfed infants can translate into a potential for cost containment for a variety of groups including women, families, employers, Health Maintenance Organizations (HMOs), and governments.

Most importantly, the only studies we have found that actually assess potential benefits of breastfeeding for women’s careers have argued that because observational studies have shown a correlational relationship between breastfeeding and better health for infants, employed breastfeeding mothers would likely miss fewer days of work to care for sick children compared to employed non-breastfeeding mothers (Ball and Bennett 2001; Cohen and Mrtek 1994; Cohen, Mrtek, and Mrtek 1995)<sup>2</sup>. Thus, breastfeeding could have a positive impact on women’s earnings, for women who are paid on an hourly basis and are not provided with sick-time or for those who might lose out on promotions if they are viewed to be unreliable or uncommitted employees.

#### *Economic Costs of Breastfeeding*

Although there is substantial evidence that a woman’s employment status and earnings predicts the initiation and duration of breastfeeding, there remains the question of what happens to a woman’s employment status and earnings once she begins to breastfeed. In fact, there is very little research that examines how breastfeeding impacts women’s economic status (Kukla 2006; Law 2000; Wolf 2007), aside from the saved expense of formula and the potential of fewer missed work days as a result of “healthier” children. This is an important omission, since it seems likely that employed mothers may reduce their work hours, take longer maternity leaves, switch to more family-friendly work, or quit work altogether in order to breastfeed (Law 2000). There is a large body of research documenting the effects of motherhood on women’s wages, particularly as a result of these kinds of changes in women’s work lives

---

<sup>2</sup> The argument that formula feeding mothers will miss work due to less healthy children are typically based on extrapolations between the types of illnesses formula fed children are more likely to contract and an estimation of how much sick time a woman would lose in order to care for these sick children. The only study we found *directly* assessing the relationship between feeding type and number of mothers’ sick days was based on a small non-random sample (Cohen, Mrtek, and Mrtek 1995). Cohen et al. (1995) found a statistically significant difference in the number of sick days reported between formula-feeding mothers and breastfeeding mothers. However, the modal categories of sick days were one and zero, with formula feeding mothers missing one day of work and breastfeeding mothers missing no work. It seems unlikely that one additional sick day would have much of an impact on a woman’s wages, especially compared to the additional cost that breastfeeding woman may incur as a result of extending their maternity leave by a month or two. Research is needed to assess this conjecture.

after having children (Budig and England 2001). However, none of this “motherhood wage penalty” research distinguishes mothers into groups based on *type* of infant-feeding.

There are a number of theories to suggest that a women’s decision to breastfeed versus formula feed her child affects her work behavior, as opposed to the other way around. Literature in the area of work-family conflict has shown that for many women family comes “before” work (Hochschild 1989; Gerson 1985; Stone 2007). Thus it seems plausible, and more accurate theoretically, that an employed mother - with the means to do so - would make a decision about whether or not to breastfeed and then adjust her work life accordingly. Also, as public health pressures for women to breastfeed have been on the rise, some have pointed to the potential for such messages to increase the guilt that working women feel for not nursing (Wolf 2007). If women find it difficult to balance the demands of breastfeeding and work, they may feel greater pressure to sacrifice work for breastfeeding in order to be “good mothers” (Eyer 1996; Hays 1998). New mothers may deal with the conflict between breastfeeding and work responsibilities by withdrawing from the workplace entirely, reducing or changing their work schedule, or by changing employers for a job that would better accommodate breastfeeding (Percheski 2008; Reynolds 2005; Roe et al. 1999).

The most significant way that breastfeeding could impact women’s work lives is by causing women to leave their jobs either temporarily through an extended maternity leave or more permanently through quitting their job in order to breastfeed their infant. For example, Canada has implemented policies to encourage breastfeeding, among other parenting activities, by providing non-self-employed parents in the labor force with a minimum of 50 weeks of paid leave through employment insurance. As Baker and Milligan (2007) find, these longer maternity leaves have led to “a substantial increase in the number of months mothers were away from work post-birth; more than three months for those eligible for leave” (29), and the new policy has also led to significant increases in the duration of time women breastfeed. However, the increased breastfeeding duration has had no effect on overall physical or psychological health outcomes of either children or mothers. Thus, evidence suggests that public policies enacted to increase breastfeeding for the purposes of improving overall child health, have not improved child health but have increased the length of time women take out of the labor market. In their small,

non-nationally representative study in the U.S., Cohen and Mrtek (1994) also found that breastfeeding mothers averaged one extra month of maternity leave compared to non-breastfeeding mothers.

If women who breastfeed their children decide to quit work entirely in order to have extended breastfeeding with their babies, they lose earnings that they would have made if they had not quit. This decision to leave the labor force may also negatively impact them in the future if they decide to work again (Arun, Arun, and Borooah 2004). During their time out of work, these women may have lost important promotions that come with increased experience, they may have become deskilled, or they may find it difficult to reenter the labor market (Mincer and Polachek 1974), although this may depend on the occupational sector within which they work (Gupta, Smith, and Verner 2008).

A second way that breastfeeding may negatively affect working women's earnings is by causing mothers to reduce their work hours (if they are able to negotiate this with their employer) in order to breastfeed at home or to pump milk while at work. Slusser et al. (2004) found in their study of one large corporation, that the women who pumped their milk did so in under an hour total, typically in two 30-minute blocks. Were one to multiply the one hour per day, times five days per week, times the approximately 24 recommended weeks of breastfeeding, this would equal 120 hours of lost work time due to breastfeeding. Assuming an 8 hour workday, that translates into 15 missed workdays. Even compensating breastfeeding women with one less sick day that their non-breastfeeding counterparts are faced with on average (Cushing et al. 1998), breastfeeding women would lose the equivalent of 14 workdays during their child's first 6 months of life (Slusser et al. 2004). Theoretically, the activity of pumping milk while at work has the potential to reduce women's earnings, if their work hours are strictly monitored/reported (i.e., they are forced to "clock out") and they are paid on an hourly basis. It is also possible, however, that women who pump breast milk while at work simply make up for lost work time by working during lunch or coffee breaks, or by staying later at work.

A third way that breastfeeding could impact women's earnings is through a switch to a job that offers more "family-friendly" policies, such as flextime or telecommuting. A number of recent studies have shown that women who partake in family friendly policies have "flatter" earnings trajectories than women who do not (Glass 2004; Weeden 2005). For instance, Glass (2004) found that for professionals and managers, usage of part-time work and telecommuting had a negative impact on wage growth.

Relatedly, Gupta et al. (2008), found that the gender wage gap has been stagnating in Nordic countries since the 1980s despite, or perhaps because of, their “family friendly” policies. The policies have increased the female labor supply which has benefited those at the lower end of the economic spectrum. However, they have also created a “boomerang effect” on women's position in the labor market (especially for more educated women), and seem to have created a “system-based glass ceiling” in which women in middle and top ranking positions have blocked upward mobility. Also, the policies have increased the likelihood of statistical discrimination from employers because more women are taking extended maternity leaves, all women are assumed to be less work committed than their male peers.

A final way that breastfeeding may impact a mother's work life is through an actual drop in her productivity (due to taking breaks to express milk) or an employer's perception that her productivity has dropped. For instance, if an employer perceives that an employee who is breastfeeding her child is less productive or committed to her work than a colleague who is formula-feeding, the employer may be less likely to promote the breastfeeding mother or to give her smaller raises. According to Martin (2007), “in America, no federal legislation directly protects working women who want to breastfeed” (5), which means that employers are not bound by federal law to accommodate or not discriminate against breastfeeding mothers. However, according to the National Conference of State Legislatures (2008), 21 states have laws related to breastfeeding and employment and may include protections for breastfeeding mothers from employer discrimination and/or requirements for employers to make reasonable efforts to provide a location other than a bathroom stall for women to express breast milk and/or to provide women with (typically unpaid) breaks needed to express milk.

Only one study has directly examined the impact of breastfeeding on women's work lives. Roe, Whittington, Fein, and Teisl (1999) assessed whether there is competition between breast-feeding and maternal employment using 1993-1994 data from the U.S. Food and Drug Administration's Infant Feeding Practices Study. This longitudinal study surveyed mothers with eleven questionnaires at various times beginning in late pregnancy through 12 months postpartum. A strength of this study is that the data were collected concurrently with the behavior, and so minimized recall bias. Additionally, this research is innovative by not simply treating employment as an exogenous determinant of breastfeeding, but by acknowledging the possibility that breastfeeding could also impact work behavior.

The authors estimate a simultaneous equation model to determine the impact of breastfeeding duration on work-leave duration concurrently with the impact of work-leave duration on breastfeeding duration. Results show that “at both times [3 and 6 months postpartum], the duration of work leave significantly affects the intensity of breast-feeding, but the reverse is generally not found” (Roe et al. 1999:157). Despite the importance of their findings, their study does not tell us (1) if there are *long-term* impacts of breastfeeding on work outcomes among those who do breastfeed (because they only follow their sample for 12 months postpartum); (2) if there is a unique “breastfeeding effect” apart from a “motherhood effect” since they only examine breastfeeding mothers in their research, and (3) if breastfeeding impacts other work outcomes beyond work-leave, such as likelihood of quitting work, reducing work hours, or earnings growth over time..

#### *Current Investigation*

Research has clearly demonstrated that income and work status are two good predictors of whether or not a mother breastfeeds her child: income has a positive effect and work status has a negative effect on the odds of breastfeeding versus formula feeding. However, the effect of breastfeeding on women’s employment outcomes is largely unknown. Since breastfeeding is less compatible with work than formula feeding, women who breastfeed their children may be more likely to quit work, more likely to take an extended maternity leave, reduce their work hours, and/or switch to a more “family friendly” job after childbirth. These strategies will likely lead to lower earnings in the short-term and may also affect long-term prospects in the labor market. Furthermore, employers may be more likely to discriminate against breastfeeding mothers compared to formula feeding mothers, and thus breastfeeders may be less likely to get promotions or equitable raises, leading to lower earnings growth. In this paper, we use the NLSY to determine whether breastfeeding mothers and formula feeding mothers have similar employment profiles (i.e. employment status, work hours, earnings trajectory) after childbirth, conditioning on their pre-employment characteristics.

#### Data, Measures, and Method

We use the National Longitudinal Survey of Youth (NLSY) (USDOL 2006) data to address our research questions. Compared to cross-sectional data, longitudinal data gives better insight into the potential causal relationship between breastfeeding status and work. This is because longitudinal data

allow us to document women's pre *and* post-birth work characteristics, to identify any change in work outcomes among mothers, and then to see whether the magnitude and direction of such changes are related to a mother's breastfeeding status. If the magnitude and/or direction of change in work outcomes is associated with breastfeeding status, this will provide strong empirical evidence that breastfeeding has a causal effect on work<sup>3</sup>.

The NLSY data are a representative sample of 12,686 American men and women age 14-22 in 1979 (born 1957-1964). Respondents were interviewed annually from 1979-1994, and biannually from 1994 to 2006. These data are particularly useful for our study because they provide detailed information on breastfeeding initiation and duration, as well as a host of labor market outcomes.

In order to create our analytic sample, we exclude women who have not given birth to at least one child between 1979 and 2000. We focus on these years because we want to observe at least one pre-birth year and five post-birth years of data for each woman (our definition of "long-term"). Because our interest is in the conflict between breastfeeding and work, we exclude those mothers who were not employed in the year prior to the first birth. Respondents with missing data on key measures are also excluded. See Appendix 1 for a full outline of the sample restrictions.

We transform the data from "wide" to "long" so that each record represents a person-year observation. The person-year observation prior to the first birth is included in the sample, as is the person-year observation during which the first birth occurred, and the five person-year observations following the first birth. By following the women's labor market outcomes for five years after the first birth we are able to see whether there are any short-term or long-term differences in the work outcomes of breastfeeders and non-breastfeeders.

### *Measures*

---

<sup>3</sup> Since longitudinal data are collected for the same individuals at many points in time, they provide information on the timing of events that we would be unable to discern with cross-sectional data collected at one point in time. Nevertheless, one could argue that knowing the temporal order of these events (e.g., childbirth → breastfeeding → quit job) does not allow us to say much about their causal relation. For instance, both events (breastfeeding and quitting job) *may* be a result of anticipations and decisions (such as placing priority on family over career) taken long before the occurrence of either event. It is also possible that mothers make both decisions – say to breastfeed and to quit work – simultaneously, either before or after childbirth. And so although the *act* of breastfeeding may occur temporally before quitting work, we may not be able to claim (unequivocally) that breastfeeding *causes* a woman to quit work because she may have planned to quit her job before she gave birth and began breastfeeding her newborn. Further, even if a causal relationship is found, this does not mean that the relationship is inevitable. It is plausible that within our current social context breastfeeding would have an impact on labor market outcomes but in another context it would not.

We run a separate set of analyses for each of our five dependent variables tapping different aspects of paid work: *employment status* (coded as 1 if working, and 0 if not working), *parental leave* (months not working due to parental leave), *employment hours* (measured continuously for those employed), *family-friendly job switch* (coded as 1 if switch to a new job post-birth that is “family-friendly”<sup>4</sup>, and 0 if else), and *annual earnings* (measured continuously in 1,000 dollar units for those currently employed).

Our main independent variables are *parental status* and *breastfeeding status*. Parental status is a dummy variable, which is equal to 0 during childless observations and 1 after the respondent gives birth to her first child. Breastfeeding status is also a dummy variable and indicates whether or not the respondent initiated breastfeeding with her first child (coded as 1 if yes, and 0 if no)<sup>5</sup>. We do not distinguish between exclusive breastfeeding (i.e. breastfeeding with no supplements of formula, cow’s milk, or other foods) versus supplemented breastfeeding. Since exclusive breastfeeding is a rarity throughout most cultures in the world (Raphael and Davis 1985; Semenic, Loiseel, and Gottlieb 2008), our more general measure of breastfeeding reflects how breastfeeding is carried out by most new mothers. We also measure the *duration of breastfeeding* in weeks. In our analysis, we explore whether mothers who breastfeed for a long duration show different labor force outcomes following birth compared to those who breastfeed for a short duration. We test for this by including a variable which is an *interaction of breastfeeding status and breastfeeding duration*.

Our control variables include a set of variables that have been shown to be correlated with both the decision to breastfeed and employment outcomes. These include *number of children* (measured as a continuous variable), *marital status* (measured as a set of dummy variables indicating never married, married, divorced/widowed), *education* (measured as a set of dummy variables indicating less than a high school diploma, high school diploma, some college education, college degree or higher), *years of work experience* and *tenure* (measured in years), *managerial/professional occupation* (measured as a dummy variable), *other family income* (a continuous level variable created by subtracting women’s income from

---

<sup>4</sup> We define family-friendly employers based on a series of responses to questions concerning what types of benefits the respondent’s employer offers: parental leave, company provided childcare, flexible hours, and the number of vacation and sick days provided. Unfortunately, this series of questions were not asked of respondents in the years 1979-1984, and so for this set of analyses, our sample is restricted to those women who gave birth in 1985 or later.

<sup>5</sup> Research suggests that breastfeeding of the second child is related to breastfeeding experience with the first child (Nagy 2001). In future work, we plan to include higher-order births in our analyses.

total family income), *race/ethnicity*<sup>6</sup> (measured as a set of dummy variables indicating white, black, Hispanic) and *age* (measured in years).

### *Methods*

In order to address our research questions, we use two types of models: a fixed-effects model and a random-effects model. Fixed-effects models examine within person variation across time and in doing so control for any time-invariant unobserved individual factors that may be correlated with the dependent variable. This method tells us how much of an impact breastfeeding has on individual women's work outcomes over time while controlling for unmeasured fixed characteristics of the women that might be associated with work behavior and propensity to breastfeed (such as motivation to work, race, childhood socialization, etc.) (Allison 2005). For example, (1) as a woman changes from the "childless state" to the "breastfeeding mother state" how does her employment status change (*parent* coefficient plus *breastfeeding* coefficient)? and (2) as a woman changes from the "breastfeeding mother state" to the "non-breastfeeding mother state" (see *breastfeeding* coefficient) how does her employment status change? Because this method derives its estimates off of individual change, only women who breastfeed will contribute to the *breastfeeding* coefficient. If the breastfeeding coefficient is not significantly different than zero, this will be evidence that breastfeeding (versus formula-feeding) has no influence on post-birth work outcomes (Hardy and Bryman 2004).

Random-effects models assume that any unobserved characteristics are not correlated with the dependent variable, and this stronger assumption allows for more precise estimates than the fixed-effects model (i.e. a fixed-effects model is a special case of random effects model). But if this assumption is not valid, the results from a random-effects model will be biased. Random-effects models are preferable to simple cross-sectional models, however, because they utilize both the variation across and within individuals in estimating the model. The random-effects model answers questions that are more tilted toward differences between childless women, breastfeeding mothers and formula feeding mothers: (1) how does the employment status of childless women compare to breastfeeding mothers (*parent* coefficient plus *breastfeeding* coefficient)? (2) how does the employment status of formula-feeding

---

<sup>6</sup> African American mothers have been shown to be far less likely to breastfeed than White mothers (Blum 1999; Kurinij et al. 1988).

mothers compare to breastfeeding mothers (see *breastfeeding* coefficient)? With this model, we are estimating the *total* effect of breastfeeding on labor market outcomes without controlling for other unobserved individual-level variables that are constant over time; that is, the random-effects estimate of breastfeeding may partially reflect the operation of these excluded variables (Hardy and Bryman 2004).

## Results

### *Descriptive Statistics*

[TABLE 1 ABOUT HERE]

There are a number of differences in the demographic profiles of breastfeeders and formula-feeders (see Table 1). On average, breastfeeders are two years older than formula-feeders and they are primarily White (81% of Breastfeeders are White, 13% are Black, and 5% are other, compared to 59% of formula-feeders are White, 35% are Black, and 5% are other). Those living in the South are more likely to formula feed than breastfeed, as 31% of Breastfeeders live in the South compared with 44% of formula-feeders. Breastfeeders are more often married (78%) than never married (15%) or divorced/widowed (7%). Formula-feeders are also more likely to be married (56%) than never married (34%) or divorced/widowed (10%) although they are less likely to be married than breastfeeders. Breastfeeders have, on average, higher rates of educational attainment, as 45% of breastfeeders have a high school diploma or less, compared with 65% of formula feeders. Three percent more breastfeeders than formula-feeders are currently working, which is a small but statistically significant difference. Of those working, breastfeeders have remained with the same employer (tenure) longer (3.39 years compared with 3.09 years), are more often in professional/managerial occupations (33% vs. 20%), and earn more income annually (\$22,979 vs. \$17,732) and hourly (\$14 vs. \$10) (both in 2000 dollars) than formula feeding working mothers. Breastfeeders breastfeed for 5.06 months, on average. Although, a general picture of the differences between breastfeeders and formula-feeders can be seen from these descriptive statistics, further analyses will be conducted shortly to assess how breastfeeding versus formula feeding impacts women's wages and work characteristics over time.

## Conclusion

This research has the potential to make contributions to the fields of gender stratification and public health by drawing attention to a neglected explanation for the gender wage gap, the motherhood

penalty, and by being the first to explore whether breastfeeding impacts women's work outcomes. If the results show that breastfeeding has no impact on women's work outcomes, this will lend further support to the epidemiological literature touting the all-encompassing benefits of breastfeeding. If the results indicate that breastfeeding has a negative impact on women's work outcomes, this research will highlight a previously under-explored factor responsible for the gender and mother/non-mother gap in earnings. All in all, this research is highly relevant both to our theoretical understanding of gender inequality in the labor market and in public policies that aim to support women's work and family demands.

In the future, further research is needed to explore the role of breastfeeding on fathers' abilities to be active parents and how that influences income disparities within households. Additional research also needs to assess whether the relationship between formula feeding and missed work due to having a sick child has a direct impact on productivity and work output, using nationally representative data that accurately measures the central concepts of interest. There is a possibility that relationship found in the aforementioned studies on this topic (Ball and Bennett 2001; Cohen and Mrtek 1994; Cohen, Mrtek, and Mrtek 1995) is a spurious one. For instance, there may be a third variable, such as poverty, which is driving both the likelihood of breastfeeding and the probability of having a sick child.

As discussed above, an important caveat to these analyses is that although we can explore the longitudinal effect of breastfeeding on women's work behavior, there remains the possibility that women make decisions about breastfeeding concurrently with decisions about work. Further, as Van Esterik and Greiner (1981) point out, breastfeeding per se does not necessarily constrain women's work, but in a culture that does not support or facilitate breastfeeding, breastfeeding and working in paid employment outside the home are often not compatible. Family-supportive work environments would make the decision of whether or not to breastfeed less difficult for many women. Conversely, our results may indicate that breastfeeding is *more* compatible with work than it really is. It is possible that only women who foresee being able to accommodate breastfeeding with ease, do so, and that those who anticipate having to back off of work choose not to nurse. In such a case, the results would underestimate the potential effect of breastfeeding on income were all women to take up breastfeeding.

Relatedly, it is important to note that not all women would be able to afford to leave the labor market in order to breastfeed exclusively. Presumably, many would like the "privilege" of, for example,

working fewer hours in order to accommodate the needs to breastfeed. While still other women may feel no pressure at all to breastfeed, and may see the dilemma between staying home and working is an issue for privileged, primarily White, women (Blum 1999). Nonetheless, the focus of this study is to compare the employment outcomes of women who breastfeed with women who do not, without making normative evaluations about what women should or should not be doing with respect to family and work responsibilities.

Our intention is not to discourage women from breastfeeding or to claw back on employer provided lactation equipment. But in order to add to both feminist and social science literature on this topic, it is important that prescriptions for women's behavior be rigorously investigated so that any hidden costs are made fully known. Further, if breastfeeding does have a negative effect on women's work lives, our research will demonstrate the need for further governmental investments in breastfeeding supports, especially if the state is going to continue to emphasize breastfeeding in its blueprints for infant health. Thus, for the time being, despite catchy slogans, it remains to be seen for whom breast really is best.

## References

- Allison, Paul. 2005. *Fixed Effects Regression Methods for Longitudinal Data Using SAS*. SAS Publishing.
- American Academy of Pediatrics (AAP). 1997. "Breastfeeding and the Use of Human Milk" Policy Statement. *Pediatrics* 100(6):1035-1039.
- American Academy of Pediatrics (AAP). 2005. "Breastfeeding and the Use of Human Milk" Policy Statement. *Pediatrics* 115(2):496-506.
- Arlotti, Jean Penrose, Barbara Hansen Cottrell, Sally Hughes Lee, and John Joseph Curtin. 1998. "Breastfeeding among Low-Income Women with and without Peer Support." *Journal of Community Health Nursing*. 15(3):163-178.
- Arun, Shoba V., Thankom G. Arun and Vani K. Borooah. 2004. "The Effect of Career Breaks on the Working Lives of Women." *Feminist Economics* 10(1):65-84.
- Auerbach, Kathleen G. and E. Guss. 1984. "Maternal Employment and Breastfeeding." *American Journal of Diseases of Children* 138(10):958-960.
- Baker, Michael & Milligan, Kevin (2007). "Maternal Employment, Breastfeeding, and Health: Evidence from Maternity Leave Mandates." Working Paper 13188. Cambridge, MA: National Bureau of Economic Research.
- Ball, Thomas M. and David M. Bennett. 2001. "The Economic Impact of Breastfeeding." *Pediatric Clinics of North America* 48(1):253-262
- Ball, Thomas M. and Anne L. Wright. 1999. "Health Care Costs of Formula-Feeding in the First Year of Life." *Pediatrics* 103(4):870-876.
- Barber-Madden, Rosemary, Marybeth Albanese Petschek, and Jean Pakter. 1987. "Breastfeeding and the Working Mother: Barriers and Intervention Strategies." *Journal of Public Health Policy* 8(4):531-541.
- Berger, Lawrence M., Jennifer Hill and Jane Waldfogel. 2005. "Maternity Leave, Early Maternal Employment and Child Health and Development in the U.S." *The Economic Journal* 115(501):F29-F47.

- Blum, Linda M. 1999. *At the Breast: Ideologies of Breastfeeding and Motherhood in the Contemporary United States*. Boston, MA: Beacon Press.
- Budig, Michelle J. and Paula England. 2001. "The Wage Penalty for Motherhood." *American Sociological Review* 66(2): 204-225.
- Chatterji, Pinka and Kevin D. Frick. 2005. "Does Returning to Work After Childbirth Affect Breastfeeding Practices?" *Review of Economics of the Household*. 3:315-335.
- Chuang, Chao-Hua, Pei-Jen Chang, Wu-Shiun Hsieh, Yueliang Leon Guo, Shu-Hui Lin, Shio-Jean Lin and Pau-Chung Chen. 2007. "The Combined Effect of Employment Status and Transcultural Marriage on Breast Feeding: A Population-Based Survey in Taiwan." *Paediatric and Perinatal Epidemiology* 21:319-329.
- Chun Chen, Yi, Ya-Chi Wu, Wei-Chu Chie. 2006. "Effects of Work-Related Factors on the Breastfeeding Behavior of Working Mothers in a Taiwanese Semiconductor Manufacturer: A Cross-Sectional Survey." *BMC Public Health* 6:160-168.
- Cohen, Rona and Marsha B. Mrtek. 1994. "The Impact of Two Corporate Lactation Programs on the Incidence and Duration of Breast-Feeding by Employed Mothers." *American Journal of Health Promotion* 8(6):436-441.
- Cohen, Rona, Marsha B. Mrtek, and Robert G. Mrtek. 1995. "Comparison of Maternal Absenteeism and Infant Illness Rates Among Breast-feeding and Formula-feeding Women in Two Corporations." *American Journal of Health Promotion* 10(2):148-151.
- Cushing, Alice H., Jonathan M. Samet, William E. Lambert, Betty J. Skipper, William C. Hunt, Stephen A. Young, and Leroy C. McLaren. 1998. "Breastfeeding Reduces Risk of Respiratory Illness in Infants." 147(9):863-70.
- Eyer, Diane. 1992. *Mother-Infant Bonding: A Scientific Fiction*. London: Yale University Press.
- Gupta, Nabanita Datta, Nina Smith, Mette Verner. 2008. "The Impact of Nordic Countries' Family Friendly Policies on Employment, Wages, and Children." *Review of Economics of the Household* 6:65-89.
- Fein, Sarah B. and Brian Roe. 1998. "The Effect of Work Status on Initiation and Duration of Breast-Feeding." *American Journal of Public Health* 88(7):1042-1046.

- Gerson, Kathleen. 1985. *Hard Choices: How Women Decide About Work, Career, and Motherhood*. Berkeley and Los Angeles: University of California Press.
- Gielen, Andrea Carlson, Ruth R. Faden, Patricia O'Campo, C. Hendricks Brown, and David M. Paie. 1991. "Maternal Employment during the Early Postpartum Period: Effects on Initiation and Continuation of Breast-Feeding." 87(3):298-305.
- Glass, Jennifer. 2004. "Blessing or Curse? Work-Family Policies and Mother's Wage Growth over Time." *Work and Occupations*. 31(3):367-394.
- Haider, Steven J., Alison Jacknowitz, and Robert F. Schoeni. 2003. "Welfare Work Requirements and Child Well-Being: Evidence from the Effects on Breast-Feeding." 40(3):479-497.
- Hardy, Melissa and Alan Bryman. 2004. *Handbook of Data Analysis*. Thousand Oaks, CA: Sage Publications.
- Hawkins, Summer Sherburne, Lucy Jane Griffiths, Carol Dezateux, Catherine Law, and the Millennium Cohort Study Child Health Group. 2007. "The Impact of Maternal Employment on Breast-feeding Duration in the UK Millennium Cohort Study." *Public Health Nutrition* 10(9):891-896.
- Hays, Sharon. 1998. *The Cultural Contradictions of Motherhood*. New Haven, CT: Yale University Press.
- Hochschild, Arlie. 1989. *The Second Shift: Working Families and the Revolution At Home*, with Anne Machung. Viking.
- Hoey, Christine and Julie L. Ware. 1997. "Economic Advantages of Breast-Feeding in an HMO Setting: A Pilot Study." *The American Journal of Managed Care*. 3(6): 861-865.
- Khoury, Amal J., S. Wakerul Moazzem, Chad M. Jarjoura, Cathy Carothers, Agnes Hinton. 2005. "Breast-Feeding Initiation in Low-Income Women: Role of Attitudes, Support, and Perceived Control." *Women's Health Issues* 15:64-72.
- Kimbrow, Rachel Tolbert. 2006. "On-the-Job Moms: Work and Breastfeeding Initiation and Duration for a Sample of Low-Income Women." *Maternal and Child Health Journal*. 10(1):19-26.
- Kurini, Natalie, Patricia H. Shiono, and George G. Rhoads. 1988. "Breast-Feeding Incidence and Duration in Black and White Women." *Pediatrics* 81(3):365-371.
- Kurini, Natalie, Patricia H. Shiono, Sandi F. Ezrine, and George G. Rhoads. 1989. "Does Maternal Employment Affect Breast-Feeding?" *American Journal of Public Health* 79(9):1247-1250.

- Kukla, Rebecca. 2006. "Ethics and Ideology in Breastfeeding Advocacy Campaigns." *Hypatia* 21(1):157-180.
- Law, Jules. 2000. "The Politics of Breastfeeding: Assessing Risk, Dividing Labor." *Signs* 25(2):407-450.
- Lindberg, Laura Duberstein. 1996. "Women's Decisions about Breastfeeding and Maternal Employment." *Journal of Marriage and the Family*. 58(1):239-251.
- Martin, Melissa. 2007. "Breastfeeding in the Workplace: Accommodating Women and Benefiting Employers." Working paper available at: [http://works.bepress.com/melissa\\_martin/1](http://works.bepress.com/melissa_martin/1).
- Mincer, Jacob and Solomon Polachek. 1974. "Family Investments in Human Capital: Earnings of Women." *Journal of Political Economy* 82(2): S76-S110.
- Montgomery, Debbie L. and Patricia L. Splett. 1997. "Economic Benefit of Breast-Feeding Infants Enrolled in WIC." *Journal of the American Dietetic Association*. 97(4):379-385.
- Nagy E, H. Orvos, A. Pál, L. Kovács, and K. Loveland. 2001. "Breastfeeding Duration and Previous Breastfeeding Experience." *Acta Paediatrica* 90(1): 51-56.
- National Conference of State Legislatures. 2008. "50 State Summary of Breastfeeding Laws." Denver, CO and Washington, DC: National Conference of State Legislatures, Retrieved September 21, 2008 (<http://www.ncsl.org/programs/health/breast50.htm>)
- Ong, Gary, Mabel Yap, Foo Ling Li, and Tai Bee Choo. 2005. "Impact of Working Status on Breastfeeding in Singapore: Evidence from the National Breastfeeding Survey 2001." *The European Journal of Public Health* 15(4): 424-430.
- Percheski, Christine. 2008. "Opting Out? Cohort Differences in Professional Women's Employment Rates from 1960-2005." *American Sociological Review*. 73(3): 497-517.
- Raphael, Dana and Flora Davis. 1985. *Only Mothers Know: Patterns of Infant Feeding in Traditional Cultures*. Westport, CT: Greenwood Press.
- Reynolds, Janice. 2005. "Breastfeeding and the Workplace: Supporting Breastfeeding through the Federal Labour Standards." Brief prepared for Human Resources and Social Development Canada.
- Roe, Brian, Leslie A. Whittington, Sara Beck Fein, and Mario F. Teisl. 1999. "Is There Competition between Breast-Feeding and Maternal Employment." *Demography* 36(2):157-171.

- Ryan, Alan S., Wenjun Shou, and Mary Beth Arensberg. 2006. "The Effect of Employment Status on Breastfeeding in the United States." *Women's Health Issues* 16:243-251.
- Simard, Isabel, Huguette Turgeon O'Brien, André Beaudoin, Daniel Turcotte, Dominique Damant, Suzanne Ferland, Marie-Josée Marcotte, Nathalie Jauvin, and Lyne Champoux. 2005. "Factors Influencing the Initiation and Duration of Breastfeeding among Low-Income Women Followed by the Canada Prenatal Nutrition Program in 4 Regions of Quebec." *Journal of Human Lactation* 21:327-337.
- Slusser, Wendelin M., Linda Lange, Victoria Dickson, Catherine Hawkes, and Rona Cohen. 2004. "Breast Milk Expression in the Workplace: A Look at the Frequency and Time." *Journal of Human Lactation*. 20:164-169.
- Stone, Pamela. 2007. *Opting Out? Why Women Really Quit Careers and Head Home*. Berkeley, CA: California Press.
- U.S. Department of Health and Human Services (US DHHS). 2000. *HHS Blueprint for Action on Breastfeeding*. Washington, D.C.: Department of Health and Human Services, Office of Women's Health.
- United States Department of Labour (USDOL). 2006. *NLSY79 User's Guide: A Guide to the 1979-2004 National Longitudinal Survey of Youth Data*. Bureau of Labor Statistics.
- Van Esterik, Penny and Ted Greiner. 1981. "Breastfeeding and Women's Work: Constraints and Opportunities." *Studies in Family Planning* 12(4):184-197.
- Visness, Cynthia and Kathy I. Kennedy. 1997. "Maternal Employment and Breast-Feeding: Findings from the 1988 National Maternal and Infant Health Survey." *American Journal of Public Health* 87(6):945-950.
- Wagner, Carol L., Mark T. Wagner, and Thomas C. Hulsey. 2000. "Factors Influencing a Mother's Decision to Breastfeed." *Short and Long Term Effects of Breast Feeding on Child Health*. Hingham, MA: Kluwer Academic Publishers.
- Wall, Glenda. 2001. "Moral Constructions of Motherhood in Breastfeeding Discourse." *Gender and Society* 15(4):592-610.
- Weeden, Kim A. 2005. "Is There a Flexiglass Ceiling? Flexible Work Arrangements and

Wages in the United States.” *Social Science Research* 34(2):454-82.

Wolf, Joan B. 2007. “Is Breast Really Best? Risk and Total Motherhood in the National Breastfeeding Awareness Campaign.” *Journal of Health Politics, Policy, and Law*. 32(4):595-636.

World Health Organization (WHO). 2003. *Global Strategy for Infant and Young Child Feeding*. Geneva, Switzerland: World Health Organization.

**Table 1. Descriptive Statistics for Mothers, by Breastfeeding Status of First Born, NLSY**

<b>Variable</b>	<b>Breastfeeders</b>	<b>Formula-feeders</b>
Age	27.5*	25.4
Race		
White	81%*	59%
Black	13%*	35%
Other	5%	5%
Living in the South	31%*	44%
Marital Status		
Never married	15%*	34%
Married	78%*	56%
Divorced/widowed	7%*	10%
Education		
Less than high school	7%*	13%
High school diploma	38%*	52%
Some college	26%*	23%
College degree or higher	29%*	11%
Number of biological children	1.06	0.98
Currently Working	62%*	59%
If working:		
Tenure (years)	3.39*	3.06
Professional/managerial occupation	33%*	20%
Annual Income (in 2000 dollars)	\$22,979*	\$17,732
Hours worked per week	35.08	35.94
Hourly wage (in 2000 dollars)	\$14*	\$10
Fringe-benefits at job	-	-
Breastfeeding duration (in months)	5.06	-
N (person-years)	5,745	4,495
Number of respondents	887	665
Average number of observations per respondent	6.5	6.8

Note: The sample includes 1 pre-birth obs, 1 birth-year obs, and 5 post-birth obs. per woman. Values with an asterisk are significantly different by breastfeeding status at the  $p < .05$  level.