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# DEVELOPMENT AND PILOTING OF THE EMPLOYEE PERCEPTIONS OF BREASTFEEDING SUPPORT QUESTIONNAIRE



presented by

Sally W. Greene

has been accepted towards fulfillment of the requirements for the

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## DEVELOPMENT AND PILOTING OF THE EMPLOYEE PERCEPTIONS OF BREASTFEEDING SUPPORT QUESTIONNAIRE

### BY

SALLY W. GREENE

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#### A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

MASTERS OF SCIENCE

Department of Food Science and Human Nutrition

2008

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#### ABSTRACT

## DEVELOPMENT AND PILOTING OF THE EMPLOYEE PERCEPTIONS OF BREASTFEEDING SUPPORT QUESTIONNAIRE

#### BY

#### SALLY WEBSTER GREENE

Maternal employment has been reported as a key factor for discontinuing breastfeeding, so it is vital to identify work climate components perceived by women as barriers to breastfeeding. The purpose of this study was to develop an instrument to quantify perceptions of the work climate for breastfeeding support. Procedures based on Messick's (1995) 'unified framework' as modified by Wolfe et al. (2000, 2004, 2006, 2007) were used. The ecological perspective informed the instrument subscales: company, manager, coworkers, workflow, and physical environment. Items were developed based on literature and expert review. One-on-one interviews with working mothers that had given birth in the last year (n=14) and a review by experts (n=11) including practitioners (with credentials and experience in the lactation field) and researchers (with experience in survey development or lactation research), assessed subscales, verified survey content and clarified item wording. The instrument was piloted with non-managerial employees who were pregnant or had given birth within the last year (n = 104). Fit analysis was used to determine misfit of items within a pre-defined model. Items that exhibited misfit were scrutinized to determine if they should be removed based on substantive reasoning. The resulting instrument contained two dimensions, one based on company policies and practices (23 items), and the other on manager and coworker support (18 items).

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I would like to extend my heartfelt appreciation to my advise Dr. Beth Olsen for her unwavering support and thoughtful guidance. I am grateful for all of her time and effort in tackling this important, yet atypical, marition project. It was a read of discovery for both of us. I admite your dedication to promoting heartfeeting through scholarly means. I would like to thank my committee members Dr. Sharon Hoerr and Dr. Katherine Alainto for their encouragement and insightful comments. I would also like to thank Dr. Edward W. Wolfe of Virginia Tech and Dr. Ingrid Pulmar of Georgin Tech. I an also grateful for the financial support provided by the College of Agricultur. To breastfeeding women everywhere Techendo Finde.

Tormy lab mates: Tracie Bolton, Stephanic Schoemar, Shabnari Momin, Tan Chow, Sarah Hojnacki, and Krystyna lwanaki; it has been a pleasure sharing my journey with each of you. A special thanks goes to Tracie, for always having time for my questions and for sharing the trials of being a working mother.

To my filend Anda Zile, thanks for asking the land questions, what more is there to say than, 'Cheers',

I could have never got where I am today without its support, see similar and emotional, of my parents. Thank you for believing in see. The day, so my partner Mike Smola and daughter Cassidy, all of your love and approve a seat for high for me to wrap words around.

## ACKNOWLEDGEMENTS

I would like to extend my heartfelt appreciation to my advisor Dr. Beth Olson for her unwavering support and thoughtful guidance. I am grateful for all of her time and effort in tackling this important, yet atypical, nutrition project. It was a road of discovery for both of us. I admire your dedication to promoting breastfeeding through scholarly means. I would like to thank my committee members Dr. Sharon Hoerr and Dr. Katherine Alaimo for their encouragement and insightful comments. I would also like to thank Dr. Edward W. Wolfe of Virginia Tech and Dr. Ingrid Fulmar of Georgia Tech. I am also grateful for the financial support provided by the College of Agriculture & Natural Resources Graduate School Fellowship Funds.

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To my friend Anda Zile, thanks for asking the hard questions, what more is there to say than, 'Cheers'.

I could have never got where I am today without the support, both financial and emotional, of my parents. Thank you for believing in me. Finally, to my partner Mike Smola and daughter Cassidy, all of your love and support is just too big for me to wrap words around.

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FMLAPamily and Medical Lea	

## LIST OF ABBREVIATIONS

BIC	
CoNLSY	Children of the National Longitudinal Study of Youth
DO	
EPBS-Q	The Employee Perception of Breastfeeding Support Questionnaire
FMLA	
НМО	health maintenance organization
HP2010	
IBCLC	International Board Certified Lactation Consultants
LLLI	
MBA	
MI PRAMS	Michigan Pregnancy Risk Assessment Monitoring System
MRCMLM	Multidimensional Random Coefficients Multinomial Logit Model
NIS	National Immunization Survey
NLSY79	National Longitudinal Study of Youth
NMIHS	National Maternal and Infant Health Survey
SIDS	sudden infant death syndrome
SRHM	Society for Human Resource Management
WICSpe	cial Supplemental Nutrition Program for Women, Infants, and Children

2005; AAP, 2005; ADA, 2005; Satcher, 2001; US Surgeon General, 2000; World Health Organization, 2003). Despite these recommendations and the growing body of literature describing the benefits of breastfeeding, breastfeeding traces remain low. Although 70% of women start interastfeeding, only 2006 sensition breastfeeding at 6 months (Li, Darling, Maurice, Barker, & Conserved-Surner, 2005). Rates are even lower among women why work ("Breastfeeding Trands Through 2002", 2003).

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#### INTRODUCTION

2003; Kimbro, 2006), similar analyses have shown disperities in rates of

#### 1.1 Background

Breastfeeding is the gold standard for infant feeding in the United States. Breastfeeding has numerous short- and long-term benefits for infants, mothers, and society (AAP, 2005; ADA, 2005; Dewey, Heinig, & Nommsen-Rivers, 1995; M. H. Labbok, 2001; Raisler, Alexander, & O'Campo, 1999). Due to the substantial benefits attributed to breastfeeding, it is recommended that new mothers exclusively breastfeed for 6 months, and continue breastfeeding for at least one year or longer, if mutually desired, except in rare circumstances (AAFP, 2005; AAP, 2005; ADA, 2005; Satcher, 2001; US Surgeon General, 2000; World Health Organization, 2003). Despite these recommendations and the growing body of literature describing the benefits of breastfeeding, breastfeeding rates remain low. Although 70% of women start breastfeeding, only 36% remain breastfeeding at 6 months (Li, Darling, Maurice, Barker, & Grummer-Strawn, 2005). Rates are even lower among women who work ("Breastfeeding Trends Through 2002", 2003).

There are many personal and social factors that influence why women choose not to breastfeed. One factor clearly associated with reduced breastfeeding rates is full-time employment (McKinley & Hyde, 2004; Visness & Kennedy, 1997). As increasing numbers of women have entered the workforce,

the subsequent impact of employment on breastfeeding rates has been examined in various studies. Although national surveys have demonstrated that rates of <u>breastfeeding initiation</u> are similar among women, regardless of work status (Ahluwalia, Morrow, & Hsia, 2005; , "Breastfeeding Trends Through 2002", 2003; Kimbro, 2006), similar analyses have shown disparities in rates of <u>breastfeeding duration</u> among women working full-time, as opposed to those working part-time or not working outside of the home (Ahluwalia, Morrow, & Hsia, 2005; Berger, Hill, & Waldfogel, 2005; Chatterji & Frick, 2003). Berger et al. conducted an analysis using 1987-2000 data from the National Longitudinal Survey of Youth. This analysis found that compared to mothers who stayed at home for 12 weeks following delivery, women who returned to work at 12 weeks breastfed, on average, 6 fewer weeks.

In 2006, women represented 46% of the total United States labor force, with 75% of employed women working full-time ("Women in the Labor Force in 2006"). More importantly, the Current Population Survey for 2005 found that among mothers with children younger than one year old, 50% are in the labor force. Of these women, two-thirds are employed full-time (U.S. Department of Labor Bureau of Labor Statistics, 2006). Gaining an understanding of why full-time employment negatively impacts rates of breastfeeding duration is therefore essential.

Work climate, defined as "shared perceptions of organizational policies, practices, and procedures, both formal and informal" (Scheider, 1990), influences what behaviors are viewed as acceptable in the workplace. One possible reason



why women working full-time have reduced breastfeeding rates is that new mothers do not perceive the work climate as being supportive of breastfeeding. Yet little research has been conducted to investigate perceptions of the work climate from the viewpoint of new mothers. A majority of the research to date has employed retrospective interviews or questionnaires with women who successfully breastfed in order to characterize their breastfeeding experiences (Auerbach & Guss, 1984; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; MacLaughlin & Strelnick, 1984; Meek, 2001; Reifsnider & Taylor-Meyers, 1885; Rojjanasrirat, 2004). These studies found that among supportive factors cited. those directly related to the workplace included: support of coworkers, support of management, adequate break time, flexible schedules, and a clean, private place for expressing and storing breast milk. Most often if a barrier to breastfeeding was cited it was due to a lack of one or more of these support components within the workplace. The results of these studies give insight into why women were able to continue breastfeeding while employed, but they do not increase understanding about which of the factors were most instrumental in supporting breastfeeding.

Similarly, employer-sponsored lactation support programs, in general, have been shown to increase rates of breastfeeding duration. It is difficult to assess which component(s) of the support programs are most influential in increasing breastfeeding rates, however, because the programs evaluated varied in the amount and types of support offered (Cohen & Mrtek, 1994; Katcher & Lanese, 1985; Ortiz, McGilligan, & Kelly, 2004). As with previous studies,

analyses focused on the overall effectiveness of lactation support programs in increasing breastfeeding rates, but they did not seek to examine which components of the program were perceived by new mothers as being most useful to their attempts to continue breastfeeding. A practical way to discern which components of a support program are most effective at increasing breastfeeding rates is to develop an instrument to assess the workplace climate from the viewpoint of new mothers. Additionally, development of an instrument will help to standardized data collection methods.

Workplace climates have been studied as they relate to work-family balance (Gault & Lovell, 2006; Kopelman, Prottas, Thompson, & Jahn, 2006; Kossek, Colquitt, & Noe, 2001), and one aspect of work-family balance is provision of breastfeeding support. There has, however, been little research on work climate for breastfeeding support. Seijts conducted two studies that examined the perceived fairness of providing breastfeeding accommodations in the workplace (Gerald H. Seijts, 2002; Gerard H. Seijts, 2004). The purpose of studying coworkers' perceptions was based on the idea that if employees do not view accommodations as being fair, then companies are less likely to offer them. A scenario (based on a real-life incident) was presented to a sample of business students, participants in a Mid-Management program, and alumni of a large business school. The scenario described breastfeeding difficulties an employee experienced at work after returning from maternity leave. The results of both studies were similar in that, overall, a company was viewed as more attractive by all participants when breastfeeding accommodations were offered. When the

scenario included a personal cost for the coworker (i.e. having to cover work duties of a nursing mother) perceptions of fairness were lowest among those participants without children. The results suggest that one barrier to provision of breastfeeding support may be that coworkers believe accommodations provided to select employees (such as breastfeeding mothers) might unduly burden other employees. Unfortunately, no other aspects of the work climate have been studied, and no studies have looked directly at how the work climate for breastfeeding support is perceived by new mothers<sup>1</sup>.

#### non-managemit position

#### 1.2 Rationale

Little research has been conducted to investigate perceptions of the work climate from the viewpoint of new mothers. A majority of research in this area has been conducted by interviews or focus groups, which lack of a standardized method for collecting women's perceptions. It is necessary therefore to develop a means by which to collect data in a systematic way. The goal of this study, therefore, was to develop an instrument to assess the work climate for breastfeeding support as perceived by new mother employees. This instrument could be used by companies seeking to measure perceptions of breastfeeding support within their company by new mother employees. The company could not only get a sense of the overall climate, but also an assessment of which components of support may be lacking within their company. Due to the systematic nature of collecting data with an instrument, this instrument could be

<sup>&</sup>lt;sup>1</sup>A search on ProQuest (Business – ABI/INFORM Global), Medline (Silverplatter WebSPIRS, and Entrez PubMed) for scholarly journals (including peer-reviewed) for "work climate" and "breastfeeding" vielded no results.

used to compare perceptions across companies. Once the work climate, and areas where support may be lacking has been evaluated, more effective and efficient breastfeeding support programs could be developed and the impact on breastfeeding rates could subsequently be measured.

2.1 Health benefits of breastfeeding

1.5 Research goal this tory breastfeeding has been the multipleal method of

infant To develop an instrument to quantify perceptions of the work climate for breastfeeding support from the viewpoint of new mothers employed full-time in non-managerial positions.<sup>11</sup> (Former, 2001). Breast being rates aboved a

1.6 Research objectives
(1) To develop items for the instrument
(2) To test and refine the instrument using qualitative research methods
(3) To pilot the instrument and then use quantitative research methods in order to determine which model the data best fits, to assess item-fit within the model and to examine several indices relating to the quality of the measures produced for each subscale.

In the immediate postpartum period, defined as the first four days after birth, the breasts produce colostrum. Colostrum is beneficial for infants the antinumber of ways. Colostrum is easy for infants to dignst because it is ascreted as a low-volume high-nutrient field containing the proper ratio of each dydrates, protein and lipids. Colostrum has a laxative effect that is a sponsor for preventing infinite because exceedive biltrabir is exercised ("What is schements" here does not benefit my haby? 2000) Colose CHAPTER 2 secretory immunoglobulin A and high concentrations of the provide white blood cells known as leakbey? LITERATURE REVIEW

#### 2.1 Health benefits of breastfeeding

Throughout history, breastfeeding has been the traditional method of infant feeding. The increased availability of sanitary, convenient, commercially prepared infant formula from the 1930's through today has, however, negatively impacted breastfeeding rates (Fomon, 2001). Breastfeeding rates showed a downward trend through the 1950's and 60's, and by the early 1970's, the United States had the lowest rates of breastfeeding ever recorded. It is estimated that in the early 1970's, fewer than 25% of infants were breastfed at age 1 week, with approximately 14% receiving breast milk until 2 or 3 months of age (Fomon, 2001). Infant formula is designed to be nutritionally equivalent to breast milk, in spite of this, research on the composition of human milk, and on the health outcomes associated with breastfeeding, has established that breastfeeding is more beneficial than formula feeding (DHHS, 2000).

In the immediate postpartum period, defined as the first four days after birth, the breasts produce colostrum. Colostrum is beneficial for infant health in a number of ways. Colostrum is easy for infants to digest because it is secreted as a low-volume high-nutrient food containing the proper ratio of carbohydrates, protein and lipids. Colostrum has a laxative effect that is important for preventing jaundice because excessive bilirubin is excreted ("What is colostrum? How does it

benefit my baby?" 2006). Colostrum also contains antibodies in the form of secretory immunoglobulin A and high concentrations of the protective white blood cells known as leukocytes. Infants breastfed even for a limited amount of time after birth derive benefits from colostrum (American Academy of Pediatrics, 2005).

The health benefits do not end with colostrum. Infants fed breast milk have lower rates of morbidity, especially from infectious diseases. Research shows that breastfed infants have decreased incidences and/or severity of many infectious diseases including diarrhea (Heinig, 2001; Raisler, Alexander, & O'Campo, 1999), respiratory tract infections (Bachrach, Schwarz, & Bachrach, 2003; Oddy et al., 2004), and otitis media (Ball & Wright, 1999; Dewey, Heinig, & Nommsen-Rivers, 1995) when compared to infants fed commercially prepared infant formula. Data collected as part of the 1988 National Maternal and Infant Health Survey (NMIHS) was used to assess the effect of breastfeeding on postneonatal mortality (death of infants at ages 28 days and over but under one year) in the United States. Analysis of the NMIHS data revealed that if all infants were breastfed, as many as 720 postneonatal deaths could be prevented or delayed each year, including those from sudden infant death syndrome (SIDS) (Chen & Rogan, 2004).

Growing evidence suggests that breast milk protects a child even after feedings have been discontinued. One finding involved a reduced risk of cardiovascular disease in a group of 13-16 year olds when comparing those children that had been fed breast milk as an infant vs. those fed formula (Singhal,



Cole, Fewtrell, & Lucas, 2004; Singhal, Cole, & Lucas, 2001). Another study, using longitudinal data collected by the Centers for Disease Control and Prevention, demonstrated that an increased duration of breastfeeding was associated with a lower risk of overweight in a low-income population of non-Hispanic white 4-year-olds in the United States (Grummer-Strawn & Mei, 2004). Breast milk feedings have even been associated with long-term cognitive advantages (Evenhouse & Reilly, 2005; Horwood & Fergusson, 1998; Smith, Durkin, Hinton, Bellinger, & Kuhn, 2003).

The very act of breastfeeding also provides benefits for both mother and child. One benefit for both, is the physiological benefit of a strong infant-mother bond that can be created due to the physical closeness of breastfeeding (Else-Quest, Hyde, & Clark, 2003). Benefits specifically for mothers include less postpartum bleeding and a return of the uterus to prepregnancy size sooner, due to the increased oxytocin levels created by breastfeeding (Heinig, 1994). Breastfeeding is also associated with a lower risk for ovarian cancer (Rosenblatt, 1993) and premenopausal breast cancer (Newcomb, 1994). Additionally, it is suggested that breastfeeding is associated with less retention of weight that is gained during pregnancy (AbuSabha & Greene, 1998; Dewey, Heinig, & Nommsen, 1993; Kac, Benicio, Velasquez Melendez, Valente, & Struchiner, 2004).

friendly. Breast mills is a renewable resource and its productions from the create any pollution. An increase in breastfording rates would be served of the server he need for manufacturing, packaging, shipping, and for the server destruction 2.2 Economic and environmental benefits of breastfeeding

There are also economic benefits of breastfeeding that extend to parents and society. Parents experience direct financial benefits because they are not purchasing infant formula and related accessories. The savings can be substantial when considering that standard formula alone costs at least \$700 per year (ADA, 2005). Parents of breastfed infants may also pay less in out-of-pocket medical costs (e.g. doctor's visits, medications) since breastfed infants have decreased onset and severity of many common childhood diseases when compared to formula-fed cohorts (Weimer, 2001; Montgomery et al. 1997; Splett et al. 1998). It is estimated that a minimum of \$3.6 billion could be saved in health care costs in the United States if current breastfeeding rates were raised to meet public health goals (Weimer, 2001).

Because breastfed infants tend to be less sick, breastfeeding mothers do not experience the same wage loss compared to women who formula fed their infants (Cohen et al., 1995). This in turn is an economic benefit to employers. Employers who actively support breastfeeding among female employees report lower employee absenteeism due to infant illness, increased employee loyalty and productivity, lower turnover rates, and an enhanced company image for being family-friendly (Weimer, 2001; Cohen et al., 1995).

Breastfeeding is also a benefit to society because it is environmentally friendly. Breast milk is a renewable resource and its production does not create any pollution. An increase in breastfeeding rates would be expected to decrease the need for manufacturing, packaging, shipping, and disposal of infant formula

and related accessories, all of which are processes that require the use of nonrenewable resources such as fossil fuels (Radford, 1991; Institute for Reproductive Health/IMPACT, 1990). Imp in the United States

2.3 Breastfeeding recommendations

The U.S. Department of Health and Human Services, the American Academy of Pediatrics, the U.S. Surgeon General, the American Dietetics Association and the World Health Organization all recommend that mothers exclusively breastfeed for the first 6 months and continue breastfeeding for at least 12 months, or longer, if mutually desired, with the addition of appropriate complementary foods (AAFP, 2005; AAP, 2005; ADA, 2005; Satcher, 2001; US Surgeon General, 2000; World Health Organization, 2003). The World Health Organization goes further by recommending that breastfeeding continue until at least 2 years of age, with appropriate complementary foods added after 6 months of age (World Health Organization, 2003).

Despite these recognized benefits and recommendations, many women do not initiate breastfeeding. Even among those women who start breastfeeding, a significant proportion adds infant formula or complementary food feedings, or discontinues breastfeeding sooner than recommended. Because breastfeeding recommendations are not being met, the federal government has established national public health objectives for breastfeeding initiation and duration. The objectives set by the US Department of Health and Human Services Healthy People 2010 is to increase the proportion of mothers who breastfeed their infants

breast milk in early postpartum, at 6 months, and at one year (see Table 1)

(DHHS, 2000).

Time	1998 Baseline	HP 2010 Objective <sup>a</sup>	
	(%)	(%)	
In early postpartum	64	75	
At 6 months	29	50 50 50 50 50 50 50 50 50 50 50 50 50 5	
At 1 year	16	imple calls 25 s comprised of	

Table 1. Rates of any breastfeeding in the United States

## (DHHS, 2000)

<sup>a</sup> Healthy People 2010 Objective 16-19 (a - c).

These objectives focus only on the proportion of women that feed their infants *any* breast milk, as opposed to *only* breast milk, therefore, one outcome of the mid-term review of the Healthy People 2010 objectives was to add another objective for <u>exclusive</u> breastfeeding. This objective is to increase the proportion of mothers who exclusively breastfed their babies from birth through three months to 60% and who exclusively breastfeed through six months to 25% (*Healthy People 2010 midcourse review: revised objectives for 16-19*).

Until recently, national data collection of breastfeeding rates, especially <u>exclusive</u> breastfeeding rates, has been insufficient. Appropriate monitoring of the breastfeeding rates for the HP2010, therefore, is a high priority for the US Department of Health and Human Services. To correct for this deficiency, the Centers for Disease Control and Prevention held a meeting in 2001 to review current practices for measuring breastfeeding rates. As a result, three questions on breastfeeding initiation and duration were added to an existing surveillance system, the National Immunization Survey (NIS), to facilitate immediate data collection (Li, Zhao, Mokdad, Barker, & Grummer Strawn, 2003).

2.4 Prevalence of breastfeeding

The National Immunization Survey (NIS) is conducted annually by the Centers for Disease Control and Prevention and uses random-digit dialing to survey households with age-eligible children. Sample estimates, comprised of approximately 30,000 children, are weighted to represent the entire population of the United States nationally and by region, state, and selected large metro areas. Data collected in 2005 by the NIS demonstrated that rates of breastfeeding were the highest ever in recorded history (Li, Darling, Maurice, Barker, & Grummer-Strawn, 2005). The greatest advances occurred in rates of breastfeeding initiation, which were close to reaching national public health goals (see Table 1). An estimated 73% of women initiated breastfeeding in the early postpartum period, approaching the target goal of 75%. Advances in rates of breastfeeding duration were not as close to the HP2010 goals. Nationally, an estimated 39% of women breastfed their infants until 6 months of age with 20% continuing until their infants were 1 year old, falling short of the target rates of 50% and 25%, respectively (CDC, 2005; Li, Darling, Maurice, Barker, & Grummer-Strawn, 2005). The National Immunization Survey (NIS) also collected data on rates of exclusive breastfeeding at several time points. Nationwide an estimated 59% of infants were exclusively breastfed at seven days postpartum with rates declining

to 39% at 3 months and 14% at 6 months (*Breastfeeding: Data and Statistics:* Breastfeeding Practices — Results from the National Immunization Survey, 2005). Once again these rates were not as high as desired, the target percentages being 60% at 3 months and 25% at six months.

The current NIS data for individual states found that 21 states met the objective to have 75% of women breastfeeding in the early postpartum period. The rates for continued breastfeeding were more discouraging: only five states achieved the objective to have 50% of mothers breastfeeding their children at 6 months of age; while 11 states had 25% of mothers breastfeeding their children at 12 months of age. California, Hawaii, Oregon, Vermont and Washington were the only five states that reached all three of the Healthy People 2010 breastfeeding objectives for <u>any</u> breastfeeding; however, only Oregon achieved the <u>exclusive</u> breastfeeding objective of 25% or greater through 6 months of age. (*Breastfeeding: Data and Statistics: Breastfeeding Practices — Results from the* National Immunization Survey, 2005).

Most relevant to this research study are the breastfeeding rates for Michigan. Michigan rates for <u>any</u> breastfeeding did not reach national averages, nor did the state achieve any of the HP 2010 objectives. Breastfeeding was initiated with only 67% of infants in Michigan, with 33% of infants being breastfed at 6 months, decreasing to 16% at 12 months of age. Rates for <u>exclusive</u> breastfeeding in Michigan were also below national averages. An estimated 32% of infants were exclusively breastfed at three months of age with a decline to 8% at six months of age, compared to the target rates of 60% and 25%,

juestions related to 'exclusive' breastleeding. The Ross Mothers Bury

2.5 Prevalence of breastfeeding characterized by employment status

The National Immunization Survey does not measure rates of breastfeeding based on employment status. One national survey, known as the "Ross Mothers Survey" does categorize breastfeeding rates by women who are either employed part-time, full-time, or not employed. This survey exists as an on-going mail survey periodically sent to a nationally representative sample of new mothers. The survey asks mothers to recall the types of milk their babies received in the hospital, at one week of age, in the past 30 days, and most often in the last week. By using a multiple choice questionnaire, mothers select the kinds of milk fed to their infants from a listing that includes breast milk, commercially available infant formulas, and cow's milk. The data collected in 2002 estimated that among mothers who work full-time, close to 70% begin breastfeeding their child in the postpartum period, yet only 27% percent are still breastfeeding six months later with a decline to 13% breastfeeding at one year. In comparison, when mothers are employed part-time or not employed, 37% and 35% of mothers are breastfeeding at six months, with 21% and 24% continuing for one year, respectively ("Mothers Survey Ross Products Division Abbott Laboratories ", 2003).

Although rates of <u>any</u> breastfeeding have been measured, at this time there is no surveillance system in the United States that accurately describes <u>exclusive</u>



breastfeeding rates for women in different states of employment. It is true that the Ross Mothers Survey categorizes the women surveyed by employment and asks questions related to 'exclusive' breastfeeding. The Ross Mothers Survey estimates that in-hospital rates of exclusive breastfeeding are similar among women working full-time (45%), part-time (51%), or not employed (45%). Rates of exclusive breastfeeding at 6 months were 12%, 18%, and 20% for mothers employed full-time, part-time or not employed, respectively. The greatest discrepancies occurred when looking at rates of exclusively breastfeeding at 12 months, 15% of women not employed were breastfeeding exclusively, compared to 11% of women working part-time and just 6% of women working full-time. A problem arises, however, as to the definition of exclusive breastfeeding used in the survey. The methods used in the Ross Mothers Survey are inadequate for collecting rates of exclusive breastfeeding because the survey only collects information on the introduction of infant formula use, not on the introduction of complementary foods (Ryan, Wenjun, & Acosta, 2002). The definition of exclusive breastfeeding in this survey, therefore, is not consistent with the standard definition of exclusive breastfeeding referring to infants being fed breast milk only (Breastfeeding: Data and Statistics: Breastfeeding Practices - Results from the National Immunization Survey, 2005; M. Labbok & Krasovec, 1990). The results of this survey can be used to suggest that women working full-time outside of the home supplement with infant formula sooner when compared to women working part-time or those not employed, however, the survey should not be used as an adequate indicator of exclusive breastfeeding rates.

Clearly national surveys are lacking in data related to breastfeeding rates among women in various states of employment. Numerous descriptive studies, however, have examined the association between maternal employment and breastfeeding rates. A majority of these find that employment has a negative impact on rates of breastfeeding. These studies suggest that factors such as a general lack of support within the workplace (Reifsnider & Taylor-Meyers, 1885, 1985; Witters-Green, 2003), full-time employment vs. part-time employment (Auerbach & Guss, 1984; Duckett, 1992; Fein & Roe, 1998; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; Kurinij, Shiono, Ezrine, & Rhoads, 1989; Meek, 2001), and/or an insufficient length of maternity leave (Auerbach & Guss, 1984; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; Kearney & Cronenwett, 1991; Roe, Whittington, Fein, & Teisl, 1999), negatively affect length of breastfeeding among women employed outside of the home.

Taveras et al. (2003) conducted a prospective cohort study of 1007 medically and socially low-risk mother - infant pairs who were in a health maintenance organization (HMO). The definition of low-risk in this study excluded those infants who weighed < 2500 or > 4600 grams at birth, who had stayed in the intensive care nursery, and who had a medical problem that needed follow-up by a pediatrician or nurse practitioner. Also, excluded were mothers who were 14 years old or younger, who had a positive toxicology screen for drugs, or who spoke a language other than English or Spanish. Finally, mothers and newborns whose anticipated length of hospital stay was > 48 hours were excluded. The purpose of this study was to describe reasons for discontinuation of breastfeeding during the first 12 postpartum weeks and to evaluate associations between breastfeeding discontinuation and modifiable factors, such as workplace issues. Fifteen-minute telephone interviews were conducted at two and 12 weeks postpartum to assess breastfeeding outcomes. Of enrolled women who had initiated breastfeeding, 476 (47%) had returned to work or school by the time of the 12-week interview. Returning to work was found to be one of the strongest predictors of breastfeeding discontinuation. Among women who returned to work or school, 236 (50%) reported problems with trying to continue breastfeeding, and the women reporting problems were significantly more likely to discontinue by 12 weeks. The proportion of mothers who cited return to work as the main reason for discontinuing breastfeeding increased from 14% at two to three weeks to 58% at 10 to 12 weeks postpartum. The two major reasons mentioned for discontinuation among women returning to work were restricted schedules and breaks (50%) and insufficient privacy (20%).

Similar to other studies (Chatterji & Frick, 2003; Fein & Roe, 1998; Kimbro, 2006; Roe, Whittington, Fein, & Teisl, 1999; Visness & Kennedy, 1997), the results reported by Tavera support the assertion that women discontinue breastfeeding as they return to work. In contrast to prior studies, however, this qualitative study gives insight into specific components of the workplace that are perceived by women as restricting their ability to express breast milk in the workplace. Unfortunately, results from Taveras' study have limited application because the effects of work and school were combined, and there was no delineation between part and full-time employment.

Results similar to Taveras were also demonstrated in a study by Roe et al. (Roe, Whittington, Fein, & Teisl, 1999). The purpose of this study was to assess the competition between employment and breastfeeding. Participants of the study were predominately white (95%), married (88%) women between the ages of 16 and 43, who worked before childbirth and who had explicit plans to return to work within the 12 months after the birth of their child (N=712). Of the 275 women who returned to work full-time (> 34 hours/week), 150 (54,5%) stopped breastfeeding by the time their child was three months old, compared to the 173 (35%) women who did not work outside the home. In contrast to the study by Taveras, the Roe study also collected data on the number of daily breast feedings. It was discovered that the number of daily breast feedings declined significantly as the number of daily work hours increased. Roe's study also examined the effect of duration of work leave on duration of breastfeeding. It was found that the greatest decrease in breastfeeding occurred in the first 10 weeks after birth. The largest decline was between 6 and 10 weeks, with significant decreases continuing through 12 weeks postpartum. Since the average work leave for the participants in the study was 8 to 10 weeks, a positive association was found between length of work leave and length of breastfeeding duration. Based on these findings, Roe suggests that a 12-week maternity leave may generally be optimal.

Chatterji and Frick used data collected by the National Longitudinal Study of Youth (NLSY79) and the Children of the National Longitudinal Study of Youth (CoNLSY) to assess the effect of the timing and intensity (number of hours

worked per week) of returning to work after childbirth on the probability of initiating breastfeeding and the number of weeks of breastfeeding (Chatterii & Frick, 2003). The NLSY79 is conducted annually with a nationally representative sample of 12.686 civilian youth who were between the ages of 14-21 in 1979. Over-sampling occurred for select population subgroups (African American, indigent whites, and Armed Forces personnel) (NLSY79 Round 20 Questionnaire). The sample represented in the CoNLSY, were children of mothers who have been interviewed and/or assessed in a separate linked survey. For the purposes of the study by Chatterji et al., analysis was limited to children of those mothers who were employed part-time or full-time at some point during the year that preceded the child's birth (n=5,804). Unlike other studies that found similar rates of breastfeeding initiation among women regardless of work status ("Breastfeeding Trends Through 2002", 2003; Kimbro, 2006), the results of this study suggested that returning to work within the first three months of an infant's life was associated with a reduction in the initiating of breastfeeding by 16-18% among those women who intended to breastfeed, and a reduction in the duration of breastfeeding by four to six weeks among mothers who initiated breastfeeding. The duration of breastfeeding was reduced an additional one to four weeks among mothers who return to full-time employment within three months after delivery (Chatterij et al., 2003). The results of these studies by Roe et al. and Chatterij et al. have important implications because women in the United States return to work after giving birth sooner than in other industrialized countries. It is estimated that in the United States, one-third of mothers return to work within

three months after giving birth, while two-thirds return within six months (*Workplace Breastfeeding Support [issue paper]*, 2002) Therefore, a large proportion of infants are affected by this early return to maternal employment.

The 12 weeks of maternity leave suggested by the Roe study may be possible for women who qualify for the Family and Medical Leave Act of 1993 (FMLA). The FMLA, in part, "allows 'eligible' employees of a covered employer to take job-protected, unpaid leave, or to substitute appropriate paid leave if the employee has earned or accrued it, for up to a total of 12 work weeks in any 12 months because of the birth of a child and to care for the newborn child." ("The Family and Medical Leave Act of 1993"). Eligible employees are defined as those workers who have been employed for a total of at least 12 months by their employer, who worked at least 1,250 hours in the previous 12 months, and who are employed by a private sector company employing at least 50 workers at, or within, a 75 mile radius ("The Family and Medical Leave Act of 1993"). Unfortunately, this leaves a large portion (~40%) of women without protected leave from work. In addition, it has been found that even women who qualify for FMLA are unwilling to make use of the benefit due to loss of wages or other potential negative repercussions from employers.

2.6 Impact of employment on breastfeeding rates in Michigan

The Michigan Department of Community Health collects data for the Michigan Pregnancy Risk Assessment Monitoring System (MI PRAMS) annually. Similar to findings by Taveras, data collected for the 2002 MI PRAMS revealed that 25% of women who *never* initiated breastfeeding cited return to work/school as a barrier. Of the women who initiated breastfeeding, 25% cited return to work/school as a barrier to continued breastfeeding (PRAMS report, 2005). Although the MI PRAMS data suggested that employment is a barrier to breastfeeding, rates linked to employment status are not available for Michigan.

2.7 Federal legislation and breastfeeding

Despite the recognition that employment serves as a barrier to breastfeeding, enactment of federal legislation to protect the rights of women wishing to breastfeed in the workplace has thus far been protracted. In 1999, Congresswoman Carolyn B. Maloney (D-NY -14) introduced four individual bills on breastfeeding, two related to breastfeeding in the workplace. At present, these two bills remain in committee and have yet to be ratified. The first of these two bill seeks to protect breastfeeding under the civil rights law, requiring that women cannot be fired or discriminated against in the workplace for expressing (pumping) breast milk, or breastfeeding during their own lunch or break time (H.R. 1478, H.R. 3861). The second of these bills encourages employers to set up safe, private, and sanitary environments for women to express (pump) breast milk by providing a tax credit to employers who set up a lactation location, purchase or rent lactation-related equipment, hire a lactation consultant, or otherwise promote a lactation-friendly environment (H.R. 1163). Future enactment of federal legislation related to breastfeeding in the workplace could make a substantial

contribution to increasing the prevalence of breastfeeding among working mothers.

2.8 State legislation and breastfeeding

State legislation that protects a woman's right to breastfeed in the workplace is also currently weak. Presently, 34 states have enacted legislation related to breastfeeding. Of these, only 11 states (CA, CT, GA, HI, IL, MN, OR, RI, TN, TX, WA) and Puerto Rico have bills that contain provisions specific to breastfeeding within the workplace (Douglas Reid Weimer, 2005). Only three states (CA, CT, and IL) and Puerto Rico require employers to provide reasonable time *and* private accommodations for employees needing to express breast milk (Martucci & Coverdalel, 2001; D.R. Weimer, 2005). Little incentive exists, however, for employers to comply with state legislation because only California and Puerto Rico have penalties in place for employers who fail to comply.

Most relevant is a review of legislation related to breastfeeding in the state of Michigan. No Michigan legislation mentions workplace accommodations for breastfeeding (Martucci & Coverdalel, 2001; D.R. Weimer, 2005). Currently Michigan has two laws related to breastfeeding. The first excludes women who are breastfeeding a baby from public nudity laws (*Mich. Comp. Laws Ann. §§* 41.181, 67.1(aa), 117.4i, and 117.5h West, 2002). The other law concerns child custody and includes breastfeeding as a factor when determining parental visitation schedules (*Mich. Comp. Laws Ann. § 727.27a West, 2002.* In the absence of federal and states laws, the provision of breastfeeding


accommodations is left to individual companies. So the real issue that needs to be addressed is how best can companies be encouraged and supported to set up policies and practices within their workplace that will positively impact breastfeeding rates among those employees who want to combine breastfeeding and employment.

2.9 "Family-friendly benefits"

Because not all mothers qualify for, or chose not to make use of, FMLA there are a number of accommodations a workplace can provide to support breastfeeding. Literature examining company policies commonly referred to as "family-friendly benefits" suggests that employers who offer family-friendly benefits increase organizational commitment and job satisfaction, while decreasing work-family conflict and turnover intentions (T. D. Allen, 2001). Specifically, one study found that companies offering family-friendly benefits such as flexible sick leave and child care assistance experienced measurable reductions in turnover (Baughman, DiNardi, & Holtz-Eakin, 2003). It is also recognized that workers decide to apply for jobs not only because of cash wages, but based on how well the mix of wages and benefits meets their needs (Baughman, DiNardi, & Holtz-Eakin, 2003).

These family-friendly benefits are not offered equally across different business sectors however. A recent survey conducted by the Society for Human Resource Management (SRHM) found that 40% of companies in the Health sector offered a lactation program or designated room compared to 25% of companies within the service sector (Burke, 2005). The SRHM survey also suggests that larger companies are more likely to offer family-friendly benefits than smaller companies. For example, only 8% of small companies (1-99 employees) offer a lactation program or designated area, compared to 20% of medium companies (100-499 employees) and 28% of large companies (500 or more employees) (Burke, 2005).

Clearly, women who are provided breastfeeding accommodation personally benefit, however, it is suggested that companies as a whole may also benefit (Baughman, DiNardi, & Holtz-Eakin, 2003; Benson, 2005; Clifton & Shepard, 2004). Benefits for companies include a higher rate of return to work by women after maternity leave, staff loyalty, increased staff continuity, an added recruitment incentive, and a reduced training budget due to a reduction in turnover (R. Cohen, M. B. Mrtek, & Robert G. Mrtek, 1995; Gardner, 2002). Additionally, since health insurance premiums are based on medical costs, companies that provide health insurance to their employees may have lower premiums due to the reduced medical costs associated with infants who are breastfed (Gardner, 2002). It is also suggested that women who are provided with workplace accommodations for breastfeeding have greater job satisfaction and are more productive, which translates into a direct benefit for the companies for which they work (R. Cohen, M. B. Mrtek, & R. G. Mrtek, 1995; Gardner, 2002).

There is evidence to suggest that companies do not fully realize the benefits they can receive by providing accommodations, such as breastfeeding support, to their employees (Dunn, Zavela, Cline, & Cost, 2004; Witters-Green,



2003). Dunn et al. examined breastfeeding support policies and practices within a sample of Colorado businesses. While 70.5% (n=157) of the companies surveyed agreed that their organization would support their employees' breastfeeding needs, only a minority of respondents recognized that allowing women to breastfeed in the workplace would positively influence productivity (44.1%), recruitment (23.5%), decrease employee absenteeism (23.5%), improve morale of other employees (22.2%), or decrease employee turnover rate (17.5%).

Another issue that arose from the Dunn study was that a majority of respondents indicated that breastfeeding support was considered a non-issue due to too few employees, lack of female employees of childbearing age, or lack of request for breastfeeding support services from employees (Dunn, Zavela, Cline, & Cost, 2004). Some of the perceived lack of need can be attributed to the fact that many women discontinue breastfeeding shortly before or after returning to work (Kimbro, 2006; Roe, Whittington, Fein, & Teisl, 1999; Taveras et al., 2003). Employers viewing breastfeeding as a non-issue can also be partially explained by the workplace behavior referred to as "employee silence". Prior research in this area suggested that employees often felt uncomfortable raising issues and concerns to their bosses, yet it remained unknown as to why these employees remained silent. One study has been conducted to help explain why employees remained silent. Milliken et al. (2003) conducted in-depth interviews (n=40) with full-time employees concurrently enrolled part-time in MBA management classes. The purpose of the study was to better understand when and how participants decided to be silent about an issue of concern, and the factors they considered

when making this decision. Of the study participants, 85% cited that at least on one occasion they were unable to raise an issue or concern to their bosses even when they felt the issue was important. Fear of being viewed, or labeled, negatively was the most frequently cited reason for why employees remained silent about workplace issues that concerned them (Milliken, Morrison, & Hewlin, 2003).

Employee silence can contribute to the lack of family-friendly accommodations in the workplace. If issues of concern are not brought to light, then companies cannot take action to rectify them. Employee silence, however, is only one barrier to breastfeeding in the workplace. Research has demonstrated that even when companies offer work-family programs or benefits, many employees choose not to participate (Thompson et al. 1999). One survey conducted, found that just 2% of employees in the Fortune 500 companies utilized work-family benefits and programs (Galinsky, Bond, & Friedman, 1993). It has been suggested that employees perceive that if they utilize these benefits and programs, they will experience negative career consequences (Perlow, 1995). Perlow's study suggests that family-friendly benefits such as telecommuting may lead to negative career consequences. The results of this study highlight the concept of "face-time", i.e. that there is a direct relationship between one's presence at work and how one's contribution to the organization is viewed. Recent work in the field of work-family supports the idea that employees' perception of the work climate affects utilization of work-family programs (Thompson et al. 1999). Work climates that are perceived by employees to be

supportive are associated with higher rates of utilization. In particular, managerial support was significantly related to higher utilization and may be the most important component in employees' decisions to use family-friendly benefits and programs (Thompson et al. 1999; Frye & Breaugh 2004).

Three small studies have explored employer (manager) attitudes towards breastfeeding by female employees, including two small mail surveys and focus group work (Libbus & Bullock, 2002, Bridges et al., 1997, Brown et al., 2001). The participants in these studies were men and women, but primarily white. married, middle-aged, and highly educated. Results were similar across all three studies. Respondents were generally supportive of breastfeeding by employees, but they did not believe the workplace needed to be changed to provide more support and lacked knowledge of the benefits to employers of breastfeeding by employees, such as reduced maternal absenteeism or reduced health care costs. The focus group participants also expressed several barriers to accommodating breastfeeding women at the worksite (e.g. decreased productivity and jealousy of coworkers for extra break times) (Brown et al., 2001). These data, similar to Roe et al., suggested that although employers are supportive of the practice of breastfeeding, they lack knowledge on the benefits of breastfeeding for their workplace, and did not feel they needed to, or should, provide breastfeeding support within their worksites. Taken together, these studies support the idea that it is important to access how woman perceive their manager feels about providing breastfeeding accommodations in the workplace. If women do not feel that their

mangers are supportive of breastfeeding, it may modify their decision of whether to continue breastfeeding once returning to work.

There is also evidence to suggest that coworkers may influence whether an employee decides to utilize family-friendly benefits. A study by Seiits was conducted examining employees' perceptions of fairness based on whether breastfeeding accommodations were provided, or not provided, within a workplace (Gerard H. Seijts, 2004). Participants were a random sample of alumni from a large Canadian business school, employed and living in Canada (n=122). Seijts assessed non-managerial employees' reactions to the denial or granting of a specific workplace accommodation - meeting the needs of a breastfeeding employee. Participants received one of three scenarios by mail, which described the difficulties a fictional employee encountered when she returned to her job after three months of maternity leave, and wanted to breastfeed. The three scenarios described an organization that (a) did not accommodate a breastfeeding employee; (b) accommodated a breastfeeding employee at no personal cost to her coworkers; and (c) accommodated a breastfeeding employee, but at a personal cost to her coworkers (Gerard H. Seijts, 2004). Results of this study found that, in general, provision of breastfeeding accommodations made a difference in perceptions of fairness only to those participants who had children. Participants with children had decreased perceptions of fairness when the accommodation was not offered. Participants without children had similar perceptions of fairness whether or not a breastfeeding accommodation was provided. In contrast, when the scenario included accommodations being offered, but at a personal cost to the

coworker (e.g. covering work duties for a breastfeeding coworker), non-parents had the lowest perceptions fairness. Additionally, perceived fairness was negatively impacted when the participants held a belief that breastfeeding is a private issue that should not be brought into the workplace (Gerard H. Seijts, 2004). This study supports the idea that it is important to access women's perceptions of how their coworkers will feel about breastfeeding accommodations being provided in the workplace. Similar to the position a woman finds herself in with her manager, if women perceive that their coworkers are not supportive of breastfeeding accommodations in the workplace, it may impact their decision of whether to continue breastfeeding after returning to work.

In summation, the benefits of breastfeeding, particularly exclusive breastfeeding for the first 6 months, can be wide-ranging. Breastfeeding can be an inexpensive method of primary prevention for many acute and chronic diseases and can improve the health and well being of both mothers and infants. Breastfeeding can also decrease the cost and demands on parents, society, and health care systems. Unfortunately, due to the large number of women that return to work shortly after giving birth, breastfeeding rates remain below public health goals. It is recognized that many women discontinue breastfeeding even if they have positive personal attitudes (Berger, Hill, & Waldfogel, 2005; Galtry, 1997; McKinley & Hyde, 2004). Women may discontinue breastfeeding because overall, most work environments are not perceived as supportive of breastfeeding. There are many reasons why the worksite may not be perceived as supported. Many worksites lack the private space needed for expressing breast milk. Women are given breaks that are not frequent or long enough to maintain their milk supply. Although, a study by Slusser et al. found that most women can express breast milk for infants within two 30 minutes sessions, many workplaces lack the flexibility and appropriate space needed for employees to arrange these time blocks (Slusser, Lange, Dickson, Hawkes, & Cohen, 2004). Managers may not be supportive of, or see a need for, breastfeeding accommodations in the workplace and if family-friendly benefits are offered, employees may feel that they are disadvantaged if they make use of these policies (Galinsky, Bond, & Friedman, 1993). Furthermore, breastfeeding accommodations may not be viewed positively by coworkers if they feel these accommodations do not benefit all workers equally (Gerard H. Seijts, 2004). This may cause conflict between coworkers, and between employees and managers or companies (Gerard H. Seijts, 2004). Commonly companies lack knowledge that providing breastfeeding accommodations is beneficial for their company (Dunn, Zavela, Cline, & Cost, 2004). Worksite breastfeeding support programs in general have been shown to increase breastfeeding however, the differences in components among the programs and lack of standardized data collection methods makes it hard to assess exactly what makes these programs successful (Cohen & Mrtek, 1994; Ortiz, McGilligan, & Kelly, 2004). It is therefore necessary to be able to assess, in a standardized way, which components in the workplace are most likely to encourage breastfeeding in order to develop effective worksite lactation support programs.

### **CHAPTER 3**

#### METHODS

This project consists of two phases. The first phase was development of an instrument. This phase included item development, cognitive interviews, and expert review to test and refine the instrument before piloting. The second phase was to pilot the instrument with a sample of women representative of the target population. This phase included recruitment of women, mailing of instruments to be self-administered, collection of data, and fit analysis to determine items exhibiting misfit, and determining based on substantive reasoning if these items should be removed or reworded for future tests of the instrument. Michigan State University's Internal Review Board for research involving the use of human subjects approved both phases of the study.

### 3.1 Phase 1 - Instrument development

After a review of literature it was determined that no suitable instrument existed to measure woman's perception of the workplace climate for breastfeeding support, therefore, a new instrument was developed. Instrument development followed standard procedures of test construction designed to create a valid form of measure (M. J. Allen & Yen, 2002; DeVellis, 1991; Don A. Dillman, 2000; Fowler, 2002; Turocy, 2002; Wolfe & Smith, 2007a, 2007b) and employed design elements to improve readability (D.A. Dillman, 2000). Several instrument development activities where undertaken to develop arguments for

validity of the instrument (Wolfe & Smith, 2007b). A form to collect participant and worksite characteristics was also developed.

#### 3.1.1 Instrument purpose

The first steps in developing a new instrument are to define the purposes for which the instrument was designed, to describe the context (environment) in which the final instrument could be used, and to explain which decisions could be made based on administration of the instrument.

The instrument was designed to measure the work climate for breastfeeding support from the perspective of the target population: pregnant and new mother employees working full-time in non-managerial positions. This instrument was developed for use in specific job sectors that were identified based on literature that suggests these sectors provide family-friendly benefits (Burke, 2005). If a company provides family-friendly benefits it is more likely to also have accommodations for breastfeeding. Administration of the instrument would allow companies to determine which specific areas of the workplace are perceived by female employees as positively or negatively influencing their attempt to breastfeed. Companies could then decide which educational components would be most beneficial to include in their workplace lactation support program.

# 3.1.2 Theoretical framework of the instrument

The social-ecological perspective was used to inform the model of the instrument. The social-ecological perspective was relevant to this study because

ecological models of health behavior suggest that health behaviors, such as breastfeeding, are influenced by intrapersonal and environmental (external to the individual) factors (Glanz, 2002). These environmental factors include actual or perceived social, cultural and physical aspects of a specific environment (e.g. workplaces). This is not the first the time that an ecological framework has been used for categorizing work climate components important for the continuation of breastfeeding. A review paper published this year supports the concept of a workplace functioning as its own ecosystem, and being comprised of the woman, her social support (from coworkers and managers), and the workplace environment (Johnston & Esposito, 2007). As depicted below, the outer layer of the work climate encompasses the company's policies and practices, both formal and informal. These policies and practices do not only include written guidelines but also addresses issues such as time off after delivery, flexibility in daily workflow, job autonomy, number of hours worked per week, availability of pumping equipment, and the physical environment of where the woman is expressing breastmilk. The middle layer includes two distinct groups of employees, those employed in managerial and those employed in non-managerial positions. For this project, the focus of the middle layer is on the employee serving as the frontline manager to the study participant as well as coworkers of the study participant. The innermost layer of the work climate is the new mother employee (See Figure 1).



Figure 1: Ecological model as related to the work climate

The latent trait, or unobservable construct, that the developed instrument was designed to measure can therefore be broadly described as 'perception of the work climate for breastfeeding support'. The construct was subdivided into individual components in order to increase measurability. The construct model was organized in a Table of Specifications before undergoing expert review (Table 2).

# 3.1.3 Test specifications

The Table of Specifications included four main subscales with two

components under each subscale.

 Table 2. Table of Specifications

Construct – Perception of the work climate for breastfeeding support
Subscale 1 - Perception of company support
a. Perception of company support of new mother employees
b. Perception of company support for female employees that
breastfeed or express breast milk during work hours
Subscale 2 – Perception of support by managers
a. Perception that her manager would be supportive of
breastfeeding in general
b. Perception that her manager would help a woman manage her
job so she could combine breastfeeding and employment
Subscale 3 – Perception of support by coworkers
a. Perception that coworkers would be supportive of breastfeeding in general
b. Perception that coworkers would be supportive of a woman
breastfeeding or expressing breast milk at work
Subscale 4 – Perception of time availability
a. Perception of availability of break time
b. Perception of ability to use given break time

3.1.4 Expert review of the test specifications

In order to help establish an argument for validity of the instrument, experts (n=11) were asked to review the Table of Specifications (Table 2). This was done to ensure that the survey items fit the construct model as outlined in the Table of Specifications. For this review, the experts were given an outline of the Table of Specifications with sample items included for each subscale of the construct. The sample items were supplied in order to help the expert reviewers gain a better understanding of what content would be covered by each subscale. These experts included practitioners (with credentials and experience in the lactation field) and researchers (with experience in survey development or lactation research). Practitioners were recruited through a Listserv of Lactation Consultants based in Michigan and included registered nurses with IBCLC (International Board Certified Lactation Consultants) certification, registered dietitians with IBCLC certification, practitioners with IBCLC certification, the Michigan Coordinator of La Leche League International leaders, and the program leader for Michigan State University Extension's Breastfeeding Initiative. Researchers included Michigan State University, Georgia Tech and Virginia Tech faculty with expertise either in the field of nutrition, in the field of organizational development, or in the field of instrument development.

As a result of the expert review, one additional subscale, perception of the physical environment was added. Categories within subscales were also modified based on comments received from the review. Based on the sample items provided for each component, it was suggested by the expert reviewers to add

content area reflective of negative comments or resentment by coworkers, provision of breast pumps by companies, and possible negative repercussions by the company. Additionally, a subscale with three items was added to assess job autonomy. Each subscale and its individual components were also given a simplified title to reflect the aspects of the work environment each included, these subscale were organized in the Test blueprint. The Test blueprint (Table 3) includes six subscales with two components under each subscale, except for job autonomy. After item development (see procedure below) the number of items and the numbers of each individual statement being used to measure each component was listed.

Table 3. Test blueprint

Construct – Perception of the work climate for breastfeeding support Number of Items Item Numbers			
Subsede 1 Comment	12	·····	
Subscale I – Company	13		
a. Formal policies		1-5	
b. Work Culture			
Subscale 2 – Manager	13		
a. Emotional support	24	,26,27,29,30,32,36	
b. Instrumental support		25,28,31,33 – 35	
Subscale 3 – Coworkers	9		
a. Emotional support		37 – 40, 42,45	
b. Instrumental support	••••••	41,43 – 44	
Subscale 4 – Workflow	7		
a. Availability of time.		14 –15, 18	
b. Ability to use given t	time	16 – 17, 19, 20	
Subscale 5 – Physical environ	ment5		
a. Availability/Accessil	oility		
b. Adequacy	-		
Subscale 6 – Job autonomy			

3.1.5 Description of subscales

To further understand the construct, it is necessary to describe each subscale and its components:

• Company: measures perception of support provided at the organization level.

(1) Formal company policies. For example, written policies directly related to breastfeeding employees.

(2) Informal practices, defined here as "work culture". The work culture is an overall agreement on what behaviors are deemed as acceptable in the workplace. For example, perceptions about the acceptability of discussing a personal issue at work, such as breastfeeding.

• *Manager*: measures the woman's perceived support of her immediate manager and the manager's attitudes towards breastfeeding employees.

(1) Emotional support refers to managerial behaviors that provide empathy and demonstrate an understanding about the importance of breastfeeding. For example, a manager being open to discussing a personal issue such as breastfeeding demonstrates emotional support.

(2) Instrumental support refers to managerial behaviors that directly help the women during times of breastfeeding need. One example would be a manager willing to cover a woman's job duties in order for her to breastfeed or express breast milk.

• *Coworkers*: measures perceived support provided by coworkers and coworker's attitudes towards breastfeeding employees.

(1) Emotional support refers to coworker behaviors that provide empathy and demonstrate an understanding about the importance of breastfeeding. For example, emotional support could be provided if a coworker made positive comments about breastfeeding.

(2) Instrumental support refers to coworker behaviors that directly help the women during times of breastfeeding need. For example, a coworker that is willing to switch break times with a breastfeeding mother demonstrates instrumental support.

• *Workflow*: measures perceived availability of break time given during work hours as well as perceived ability to make use of the given time.

- Availability of break time refers to the frequency and length of breaks, as well as, the availability of additional breaks specifically for breastfeeding or pumping breast milk.
- (2) The ability to make use of given time refers to how a woman's overall workday is scheduled. For example, although a woman is offered breaks, her workday is too hectic for her to use the break time.

• The Physical Environment of the Workplace: measures perceived availability/accessibility and adequacy of the physical space where breastfeeding or expressing breast milk occurs.

- Perception of the availability/accessibility for example, relates to how close the physical space is to the woman's work area.
- (2) Perception of the adequacy of the space for example, refers to how comfortable the woman is using the physical space.

#### 3.1.6 Item development

After the Test blueprint was established, individual items for the instrument were developed. Survey items were developed for each subscale to be used with a 4-point Likert scale, with no option for 'neither agree nor disagree', in order to increase the response rate for each individual item. The instrument that was created was designed to be a self-administered questionnaire. Self-administered questionnaires are intended to gather specific information via a self-reporting system (Turocy, 2002). The goal of writing items for a self-administrated questionnaire is to develop a item that every potential respondent will interpret in the same way, be able to respond to accurately, and be willing to answer (Don A. Dillman, 2000). The first step in developing items consists of writing a pool of items. Typically this pool of items contains up to four times the number of items that will be included on the final instrument (DeVellis, 1991). An initial pool of items was constructed for each subscale in order to provide a source from which the instrument could emerge.

After the initial pool of items was generated, each individual item was evaluated to access goodness of fit to the construct, clarity, and importance. The evaluation process included eliminating or rewording items as necessary. Items were first evaluated for elimination. Items were eliminated from the pool due to lack of clarity, questionable relevance, or undesirable similarity to other items (DeVellis, 1991). Items were then assessed to see if they needed to be reworded. Some items were reworded because they were unnecessarily lengthy, but only if a shortened version could retain the same meaning. Other items were reworded to eliminate those that conveyed two or more ideas. Such items were eliminated because items conveying more than one idea can lead a respondent to falsely agree or disagree with a portion of the item (DeVellis, 1991; D.A. Dillman, 2000). Negatively worded items were also eliminated because they are more difficult to answer due to decreased clarity of meaning and increase respondent burden. Additional items were reworded to decrease reading level.

The items were evaluated using the Gunning Fog index (http://en.wikipedia.org/wiki/Gunning-Fog\_Index). The Gunning Fog index measures the grade level, or assumed readability, of a piece of writing using two factors: the average sentence length and the percentage of complex words. The Gunning Fog Index is calculated by using the following formula:

[(words/sentence) + 100 \* (complex words/words)] \* 0.4

Complex words are defined as a word of 3 syllables or more, but not a word that is (1) a combination of short words (bookkeeper); (2) a verb form that becomes polysyllabic by adding -ed, -es, or -ing, or (3) a proper name. It is suggested to use one or more passages of at least 100 words each. The Gunning Fog index for the newly developed instrument was calculated by using the first two items of each section on the instrument. For the purposes of calculating the Gunning Fog Index, 149 words were used, 10 sentences were used, and there were a total of 8

complex words within the 10 sentences. Therefore, the Gunning Fox index was calculated as 7.96.

The Gunning Fox index estimates that the instrument is just below an 8<sup>th</sup> grade reading level. A reading level between the fifth and seventh grade is appropriate for use with the general population (DeVellis, 1991). However, an 8<sup>th</sup> grade reading level for this target population should not be considered unreasonable. The Gunning Fox index equation is driven both by sentence length and percentage of complex words. Although, sentence length could be an issue, the target population should not have difficulty understanding the complex words. The eight complex words were maternity, information, manager (2 times), coworkers (2 times), company, and designated. There were a number of steps also taken to increase readability (D.A. Dillman, 2000).

### 3.1.7 Recruitment for cognitive interviews

Recruitment was done locally in establishments and through organizations likely to be utilized by employed women that had given birth in the last year. Recruitment flyers (Appendix A) were posted at the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) office; the Women Health Services office; the Department of Human Services; public libraries; Michigan State University's Family Resource Center; local child care facilities; the Expectant Parent Organization; an elementary school; grocery stores; and a hair salon. The flyer was also sent out through a Birth Center's electronic newsletter. Recruitment also occurred by word of mouth. All potential subjects

answered questions over the telephone to determine eligibility using the Interviewee Screener (see Appendix A). Inclusion criteria included: being at least 18 years of age; being employed in a non-managerial position; giving birth within the last year and returning to full-time work, defined as working 32 or more hours per week after the infant was born. In addition, each caller was asked if she had breastfed her newborn. Different paths of inquiry were followed depending on whether the woman (a) was currently breastfeeding; (b) had discontinued breastfeeding; or (c) had not breastfed.

If the caller *had* breastfed the child, she was asked when she first decided to breastfeed (before birth, during pregnancy, or after delivery), the main reason for her decision to breastfeed, and if she was currently breastfeeding her newborn. If the woman was still breastfeeding, in addition to working full-time, she was eligible for participation. If the woman was no longer breastfeeding, she was asked how long, in weeks and/or months, she breastfed after delivery in order to assess duration of breastfeeding. If the caller had discontinued breastfeeding, she was asked if work was a factor in her decision to discontinue breastfeeding. Even if employment was not the main reason for discontinuation, a woman with any amount of experience combining employment with breastfeeding was eligible for participation.

If the caller *had not* breastfed their child, they were asked, "At any point before or during your pregnancy, or after giving birth, did you consider breastfeeding?" If the caller had never considered breastfeeding, she was ineligible for the study. If the caller had considered breastfeeding at any point in

time, she was asked the main reason why she decided not to breastfeed. If the caller indicated that return to work was the main reason she did not breastfeed, she was eligible for the study. If the caller did not cite return to work as the *main reason* for her decision not to breastfeed, it was then assessed if returning to work had any influence in her decision not to breastfeed. If the caller indicated that return to work influenced her decision about breastfeeding, she was eligible for the study. If employment was not a factor in her decision, she was not eligible. This ineligibility was based on the reasoning that if woman had not at least considered breastfeeding after returning to work, it would be difficult for her to answer the instrument items.

### 3.1.8 Cognitive interviews

An argument for validity was established by the individual items being evaluated during in-depth, one-on-one interviews by a sample of women representative of the target population (n=14). The one-on-one interviews utilized cognitive interview methods, such as the "think-aloud" method which focuses on the mental processes subjects use when answering survey items and "probing" techniques asked after the subject answered the survey items (Willis, 1994). Cognitive interview methods were also used to help to decrease potential response error (Jobe & Mingay, 1989).

One-on-one interviews were conducted instead of focus groups, because one-on-one interviews are more effective than focus groups for establishing rapport between the subject and the investigator (Portney, 2000). Questions

related to breastfeeding are of a personal and potentially sensitive nature justifying the need for one-on-one interviews. Another advantage of the interview approach is the opportunity for in-depth analysis of subjects' behaviors and opinions. This occurs because the investigator can probe responses and directly observe subjects' reactions (Portney, 2000). The use of one-on-one interviews allowed the investigator to obtain in-depth information about perceptions of breastfeeding support, in order to develop questionnaire items relevant to this population.

Cognitive interview techniques are used with a group representative of the target population to find out if the items are those that subjects can consistently understand and answer (Fowler, 2002). These women spent extended time to help the investigator understand how the items were interpreted (Fowler, 2002). In this way, problems with comprehension or difficulty with response task can be dealt with before the instrument is piloted (Don A. Dillman, 2000; Fowler, 2002). Cognitive interview methods have been demonstrated as beneficial for evaluating the quality of questionnaire items and determining item meaning (Willis, 1994). In this study, cognitive interview methods were combined with an up-front short, open-ended interview question to look for any missing topics.

At the start of each interview, each woman was asked to sign an informed consent form (see Appendix A) and a gift certificate (\$20.00) confirmation form (see Appendix A). Each interview consisted of three parts: the participant and worksite characteristics form, open-ended questions, and the perceptions questionnaire. The three parts were administered in the same order during each

interview. Interviews took place at a local public library, in a private room at Michigan State University, or in the woman's home. Each interview lasted, on average, one-hour (45-75 minutes).

### 3.1.9 Cognitive interview procedures

3.1.9a Participant and Worksite Characteristics Form (5-10 minutes)

A participant and worksite characteristics form (see Appendix C) was developed for the project based on standard demographic forms used in national surveys ("US Census Bureau", 2007), and followed standards of instrument design to increase readability (D.A. Dillman, 2000). Subjects completed the characteristics form at the beginning of the interview. Items targeted important characteristics found in previous research to influence breastfeeding decisions and ones related directly to the work environment. Variables collected on the participant and worksite characteristics form included breastfeeding history, how the milk supply was being maintained, commitment to breastfeeding, length of employment with current employer, average hours worked per week, pay type, union membership, gender of immediate manager, gender of coworkers, weeks of leave after delivery, weeks of paid leave after delivery, job title, job category, number of employees at same physical location, number of total employees at all locations, racial/ethnic group, age, marital status, level of education, and yearly household salary.

The subject was informed that the purpose of the interview was to make the questions understandable to women similar to her. She was informed that if

she were unsure of what a question meant, or if she thought a question could be answered in more than one way, she should let the investigator know. Revisions to the participant and worksite characteristics form were made based on an aggregate of comments made by all subjects.

#### 3.1.9b Open-Ended Question (5-10 minutes)

An open-ended question (see Appendix A) was used to give the subject the opportunity to provide information in her own words and from her own perspective (Portney, 2000). The open-ended question was used before the participants answered the survey items to elicit unbiased comments related to components of the workplace perceived to help or hinder breastfeeding in the workplace. The open-ended question was used to discover if any additional subscales or survey items were needed. The question asked if the woman had breastfed after returning to work full-time. If she answered "yes", she was asked to describe her experience with combining breastfeeding and work. If needed, verbal probes were used to ascertain information about people in the workplace and aspects of the physical work environment that made it easier or harder for her to combine breastfeeding and employment. If the woman answered "no", she was asked to describe her workplace and ways she thought it would either support or discourage a woman who wanted to continue breastfeeding. If needed, verbal probes were used to collect information about people in the workplace and aspects of the physical work environment that she thought would make it easier or harder for women wanting to breastfeed in her workplace.

The investigator took hand-written notes during the interviews, including making notes on any non-verbal reactions, and all interviews were audiorecorded. The investigator used the tapes as needed to clarify portions of the hand-written notes. Audiotapes were stored in a locked cabinet and were destroyed at the end of the study.

### 3.1.9c Perception Questionnaire (30-40 minutes)

All subjects were asked to fill out the perception questionnaire (see Appendix A - Note: since changes were made to the questionnaire after each interview, the version included is the final version after all the interviews were completed). Each statement was rated on a 4-point Likert Scale (strongly agree, agree, disagree and strongly disagree). A series of statements expressing a viewpoint was presented (e.g. I can talk about breastfeeding at work) and the women selected an appropriate response that reflected their agreement or disagreement with each item (Portney, 2000). The women were informed that the 4-point scale was being used to increase the response rate for each individual statement and if at any time she felt the need for a "Don't Know" or "Not applicable" option, she should let the investigator know. It was reiterated that she should stop whenever she had questions, comments, or concerns about any item on the survey.

The questionnaire contained five sections. The women answered statements one section at a time. While the woman was filling out the survey, the

investigator used an identical survey to note if she hesitated, looked confused, skipped any statements, or asked for a 'don't know' or 'not applicable' option.

After completion of each section, the investigator asked the woman to describe how she felt about the group of items. Questions such as, "Tell me what you thought about that group of statements?" and "Did the statements cover issues that you thought about or experienced when you were combining working and breastfeeding?" were used to assess any missing subscales or items within subscales.

The investigator then asked specific questions about items on the survey using a technique called retrospective verbal probing (Willis, 1994). Some examples of probes used were, "What does this statement mean to you?" "Can you tell me in your own words what this statement means" and "Can you tell me what you were thinking when you answered this statement?" In addition, if the woman experienced difficulty with understanding any item she was asked to give suggestions for alternative wordings for that item in order to clarify meaning and increase understanding for women similar to her. The investigator and woman talked about each problem item until an understanding of the concept of the statement was reached.

At the end of the interview, each woman was asked if she had any additional comments about the demographic form or the survey items. Each woman was also asked if she could think of any additional issues not covered by the survey.

Statement additions and/or deletions and wording changes were made before the investigator's next scheduled interview. The investigator kept track of changes and made a point of using verbal probing on those statements during the subsequent interviews to ensure that wording changes clarified statements for all women.

Based on the interviews, components of the work environment perceived to positively influence a woman's ability to breastfeed included: provision of a private room, access to a sink and refrigerator, when women felt as if pumping was considered to be an acceptable workplace behavior, flexibility in break times, and working with a female manager/coworkers. Components perceived as having a negative influence included: no established lactation area, when the lactation area was far from the work area or not consistently available, if breaks were not frequent or long enough, if women were too busy to take breaks, if women had to travel away from the worksite, and working with a male manager/male coworkers. Based on an evaluation of information gathered during the openended questions, it was found no new subscales were needed. Survey items were added or reworded based on an aggregate of comments from the interviews.

A final revision to the instrument was done by consensus of the primary investigator and the graduate student investigator based on information gained during the interview process. One revision to the instrument was that four of the items were moved to a separate yes or no question area after it was determined that these items did not fit the structure of a Likert scale. These items ask about

provision/obtainment of breast pumps, of a storage place for expressed breast milk, and of a space to breastfeed or express breast milk.

#### 3.1.10 Expert review of survey items

Following the cognitive interviews, expert review was conducted to assess the survey subscales and to review items. Experts used in the review included the Michigan Coordinator of La Leche League International (LLLI) Leaders, LLLI Leaders who have dealt extensively with working mothers within the LLLI group setting, A Pediatric DO, a registered dietitian with IBCLC certification, a professor and extension specialist at the University of Nevada, a practitioner with IBCLC certification, the program leader for Michigan State University Extension's Breastfeeding Initiative, the breastfeeding coordinator for WIC in Michigan, and an associate professor of Nutritional Sciences at the University of Connecticut.

The expert reviewers were sent a description of each subscale (see Appendix A). They rated each item as having a high, moderate or low fit within that subscale. A majority of the expert rated each item as high fit within each subscale. The exception was one reviewer who rated two of the items as having a moderate fit. The reviewers were also asked to confirm that there was adequate coverage of the content area and that items were clearly worded. No further revisions were needed based on reviewer comments.

3.2 Phase 2 – Piloting of the Instrument 'The Employee Perception of Breastfeeding Support Questionnaire' (EPBS-Q)

Recruitment of respondents was done by creating inclusion criteria for the business sectors from which the women could be recruited and criteria for personal characteristics. An attempt was made to recruit women from at variety of companies having headquarters or single locations in Michigan. D&B's Million Dollar Database was used to create a list of potential companies from which respondents could be recruited. The database was used to find companies in the sector of communications, finance, insurance, public administration, public education, and real estate. The sector of public education was excluded from the search because companies had already been identified in this sector. Research has found these industries most likely to have work-family benefits, which increases the likelihood of them having some level of measurable breastfeeding support (Burke, 2005; Goodstein, 1994, 1995; Milliken, Martins, & Morgan, 1991). Search limits were set within the D&B's Database for State (Michigan), Employee Total (>250), Industry SIC codes (varied by sector), and Location (Headquarters, Single Location). Limiting the results to companies within Michigan eliminates possible confounders introduced by differing state laws on breastfeeding accommodations and by differences in corporate policies and administration in different locations (Martucci & Coverdalel, 2001; Scheider, 1990). An employee total of greater than 250 was chosen because of evidence to suggest that larger companies provide more family-friendly benefits (Burke, 2005). In addition to directly contacting human resource managers at potential

companies, recruitment also took place through word-of-mouth and by the posting of recruitment flyers in establishments and through organizations likely to be utilized by employed women who were pregnant or who had given birth in the last year.

# 3.2.1 Recruitment of subjects for piloting the EPBS-Q

All potential respondents answered questions over the telephone to determine eligibility (see Appendix A). Eligibility was determined based on inclusion criteria developed for piloting the EPBS-Q. Women were recruited if they were pregnant or had given birth in the last year, if they worked in a non-managerial position, and had either returned or planned to return to full-time work ( $\geq$  32 hours per week), by the time their child was three months old. Respondents had breastfed while working full-time or cited employment as a factor for not initiating or for discontinuing breastfeeding. Respondents currently pregnant needed to state an intention to breastfeed. Additionally, if the woman did not work in one of the pre-selected business sectors, it was determined if her workplace made her ineligible for inclusion. If the woman worked in sectors such as retail, service, or for a franchise she was ineligible because it was determined that her working conditions would be disparate from the target companies.

# 3.2.2 Procedures for piloting testing of the EPBS-Q

After it was established that the respondent met all of the inclusion criteria, her name, mailing address, phone number and the date the EPBS-Q was

mailed were recorded in an address database. Each respondent was then mailed a packet that included a cover letter (see Appendix A), consent form (see Appendix A), the EPBS-Q (see Appendix A), a page for writing in additional comments or suggestions, a form to indicate where the gift certificate should be mailed, and a postage-paid envelope addressed to the investigator. When a packet was returned to the investigator, the consent form and the page indicating where the gift certificate should be mailed was separated from the EPBS-Q. The consent form was filed with the respondent's phone screener and a gift certificate was mailed to the investigator, and the date the gift certificate was mailed to the respondent, was then added to the address database. The EPBS-Q, along with the participant and workplace characteristics, was coded so that no names were associated with survey responses.

The cover letter requested that the respondents return the EPBS-Q within two weeks from the date of receiving it. To increase the response rate, any respondent not returning the EPBS-Q within 6 weeks was sent an additional survey packet, if that packet was not returned within two weeks, a third mailing was sent out. If the third mailing was not received the participant was considered as being lost to follow-up.

Data was entered into an Excel database using a coding scheme for each variable as described (see Appendix B). After the primary graduate student entered the data, the data was doubled entered by another student to check for accuracy. After both students entered the data independently, a visual check was

made to determine if any of the data had been entered differently. Any data found to be entered incorrectly was checked against the hardcopy of the survey. Changes were then made to the database as needed to accurately reflect data collected on the surveys.

# 3.3 Scaling

Three models were developed to depict a relationship between the items. Model D5 is a five-dimensional model based on company polices/practices, manager support, coworker support, workflow, and physical environment. Model D2 is a two-dimensional model based on the components of company polices/practices and manager/coworker support. Model D3 is a threedimensional model based on the components on time, support, and acceptability (see Figure 2). These models were based on a review of the literature that attempts to characterize successful breastfeeding.



Figure 2. Three models to depict a relationship between items

Structural parameters were estimated for each model using ConQuest Software (Version 1.0, 1998) and model fit was compared. Parameters were estimated for the Multidimensional Random Coefficients Multinomial Logit Model (MRCMLM) for each of the specified dimensionality models (Model D5, Model D2, and Model D3) as well as for two test models, a unidimensional model (Model D1) and a model (Pos vs. Neg) that scaled normal coded items vs, reverse coded items. Using those estimated parameters; expected responses were obtained for each person-by-item combination in the original dataset, and these expected values were compared to observed values to compute fit statistics for each person and each item.

Six items were flagged because they consistently showed misfit across the specified dimensionality models. In other words, these items were associated with a respondent response pattern that was inconsistent with the measurement models and none of the models could account for the variability in these items. These items were scrutinized to determine if they should be removed based on substantive reasoning.

Analysis was then done to determine which of the models exhibited the best fit. The Bayesian Information Criteria (BIC), a misfit statistic, was used to compare models. (see Appendix B). BIC is a global statistical criterion for model selection. The interpretation of the BIC value is that the larger the value, than the less well the data fits the model, therefore, the model with the smallest value is determined to be the best model. The BIC is a correction of the deviance statistic

for the number of parameters. The BIC equalizes parameters so that the deviance statistic, which is bias in favor of models that have more parameters, is equalized for each model. The BIC looks at parameters for the model and exhibits how much error is left after the model is explained. Given estimated models, the model with the lower value of BIC is the one to be preferred. From this analysis it was determined that the two-dimensional model (Model D2) was the best model to depict a relationship between the items.

Analysis was done to determine item-fit within Model D2 (Figure 1), when the data were scaled to a multidimensional measurement model. Model D2 contains two unidimensional scales. Dimension 1 includes those items related to company policies and practices, while dimension 2 includes those items related to manager and coworker attitudes and support. Items found to have a standardized mean-squared fit statistic of an absolute value of fit greater than 2 were scrutinized to determine if they should be removed from the instrument based on substantive reasoning.
#### **CHAPTER 4**

# "The Development of an Instrument to Measure Female Employees' Perceptions of Workplace Breastfeeding Support"

4.1 Abstract

Breastfeeding rates remain low in the United States, especially among working women. Unfortunately, no quantitative instrument exists to facilitate the examination of why women who return to work discontinue breastfeeding sooner than the general population. The objective of this study was to develop an instrument to measure female employees' perceptions of breastfeeding support in the workplace, which would be suitable for piloting with the target population. Examination of the literature, reviews with experts, and one-on-one interviews with women who had experience combining breastfeeding and work were used to create the instrument subscales and items. Examination of the literature was used to develop four subscales: company policies/work culture, manager support, coworker support, and workflow. Expert review resulted in the addition of a fifth subscale, the physical environment of the breastfeeding space. One-on-one interviews were used to ensure that the item wording was appropriate for the target population. Eighteen items were added to the initial item pool and fifteen were reworded based on comments from the expert review and from the interviews. The resulting survey contained fifty-four items that required either categorical yes/no or Likert scale responses. Results from this process indicate the survey subscales and items adequately reflect women's perceptions of breastfeeding support in the workplace and the instrument is appropriate for piloting with new mother employees.

## 4.2 Introduction

Research shows that breastfed infants have decreased incidences and severity of many infectious diseases including diarrhea (Heinig, 2001; Raisler, Alexander, & O'Campo, 1999) respiratory tract infections (Bachrach, Schwarz, & Bachrach, 2003; Oddy et al., 2004), and otitis media (Ball & Wright, 1999; Dewey, Heinig, & Nommsen-Rivers, 1995), when compared to infants fed commercially prepared infant formula. Although most women giving birth in the United States begin breastfeeding, a majority of them do not continue for as long as recommended. In 2004, 74% of women began breastfeeding, but only 41.5% of those women continued through six months ("Breastfeeding: Data and Statistics: Breastfeeding Practices --- Results from the National Immunization Survey", 2004). Breastfeeding rates are even lower among working women, especially when comparing women who work full-time to those who work parttime (Global Strategy for Infant and Young Child Feeding, 2003; McKinley & Hyde, 2004; Visness & Kennedy, 1997) and to those who do not work outside of the home ("Breastfeeding Trends Through 2002", 2003). One potential explanation for why working women have lower breastfeeding rates is that new mother employees do not perceive the work environment, or "work climate", as being supportive of breastfeeding (Cardenas & Major, 2005; Rojjanasrirat, 2004). The work climate, defined as "shared perceptions of organizational policies, practices, and procedures, both formal and informal" (Schneider, 1990), influences which behaviors are viewed as acceptable in the workplace.

Studies examining breastfeeding in the workplace have used varying methods of data collection such as interviews (retro- and prospective) (Auerbach, 1984; Taveras et al., 2003), self-administered questionnaires (Cohen & Mrtek, 1994; Ortiz, McGilligan, & Kelly, 2004), and secondary data analysis (Cardenas & Major, 2005), making comparisons across studies difficult. The Breastfeeding Attrition Prediction Tool (BAPT), an instrument that has been used in a number of studies, quantifies women's risk for early weaning at the time a new mother leaves the hospital after delivery (Dick et al., 2002). The BAPT, however, does not focus on breastfeeding issues in the workplace. In order to better understand reasons for breastfeeding attrition among working women, a quantitative instrument for use in data collection is needed. To develop an instrument suitable for piloting, a carefully designed process appropriate for the individual project must be developed (Wolfe & Smith, 2007a). In this study, we describe the process of developing such an instrument through use of a review of the literature, reviews by experts, and cognitive interviews with women from the target population. This study reports these initial steps used to create a new instrument designed to measure perceptions of workplace breastfeeding support from the viewpoint of new mothers.

### 4.3 Materials and methods

### 4.3.1 Study Design

Three steps were followed to develop the instrument subscales and items: a review of the literature, reviews by experts and cognitive one-on-one interviews.

4.3.2 Literature review

The social ecological model was used as the theoretical basis of the instrument (Glanz, 2002). The social ecological model recognizes that there are many layers of influence that affect health behaviors such as breastfeeding. A review of the literature from a variety of research areas, such as breastfeeding support, health behavior, work climate, and work-family balance, was conducted to determine what layers of influence exist in the workplace. Applied to the workplace, these layers of influence include the space used for breastfeeding (built environment), company policies (organization structure), managers and coworkers (*human aggregate*), and the supportiveness for breastfeeding behaviors (social climate). Research conducted with working women who breastfed (Auerbach & Guss, 1984; Cohen & Mrtek, 1994; DiGirolamo, Thompson, Martorell, Fein, & Grummer-Strawn, 2005; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; Johnston & Esposito, 2007), companies (Dunn, Zavela, Cline, & Cost, 2004), managers (Bridges, Frank, & Curtin, 1997; Brown, Poag, & Kasprzycki, 2001; Libbus & Bullock, 2002), coworkers (Gerard H. Seijts, 2004), and in the area of work-family balance (Cardenas & Major, 2005; Kopelman, Prottas, Thompson, & Jahn, 2006; Thompson, Jahn, Kopelman, & Prottas, 2004) was examined to discover common themes within each layer of influence, which were then organized into subscales for the instrument. Review of the literature was also used to develop the instrument items for each subscale in order to address specific components of the workplace found to either support or hinder breastfeeding.

4.3.3 Expert reviews

Reviews by experts were used to evaluate the appropriateness, content, clarity, and sensitivity of the survey subscales and items (Wolfe & Smith, 2007a). Experts were mailed or emailed a copy of the survey, which included space by each item and at the end for comments. The expert reviewers included International Board Certified Lactation Consultant's (IBCLC), the Michigan State Coordinator of Le Leche League International Leaders (LLLI), LLLI Leaders who have dealt extensively with working mothers within the LLLI group setting, the leader of a breastfeeding support program, the breastfeeding coordinator for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in Michigan, and researchers with an expertise in nutrition or business. The reviewers were instructed to assess (a) the comprehensiveness of the survey subscales, (b) the need for additional items, (c) the clarity of item wording, and for those items found to be unclear, to suggest alternative wording.

Additionally, an expert in the field of evaluation design and implementation participated throughout the instrument development process. This expert assisted in all of the study procedures to ensure that standard methods of instrument design were being followed (Messick, 1995; Wolfe & Smith, 2007a, 2007b).

# 4.3.4 Interviews

Items were then pilot tested during one-on-one interviews with a purposive sample of working women that had given birth within the last year. Recruitment was by flyers and word-of-mouth, and a phone screener was used to

determine eligibility. Women were eligible if they (a) had given birth within the last year, (b) had breastfeeding experience, (c) had returned to work full-time (>32 hours per week), and (d) were employed in a non-managerial position. Interviews took place in a private location and each interview lasted, on average, one-hour. Participants received a \$20.00 gift card.

Each interview began with an open-ended question asking the participant to describe her experience with breastfeeding at work. The open-ended question was used before the participants answered the survey items to elicit unbiased comments related to workplace breastfeeding support. The use of the open-ended question allowed the investigator to obtain in-depth information about perceptions of breastfeeding support in the participants' own words. If needed, verbal probes were used to ascertain information about people in her workplace and aspects of the physical work environment making it easier or harder for her to breastfeed at work. The investigator took hand-written notes during the interviews, including notes on any non-verbal reactions, and all interviews were also audio-recorded. The investigator used the audiotapes as needed to clarify hand-written notes. Information gathered from the open-ended question was examined to determine if any additional subscales or survey items were needed.

Each participant was then presented with and asked to evaluate the items written for the initial draft of the instrument. The participant was asked to select an appropriate response to reflect her agreement or disagreement with each survey item (strongly agree, agree, disagree, or strongly disagree). The participant was asked to let the investigator know if she felt the need for a "Don't know" or "Not

applicable" option on any item. This information was collected to determine if a 'neither agree or disagree' option should be added to the response options on the instrument. As the participant completed the survey, cognitive interview methods (e.g. "think-aloud" and verbal probing)<sup>35</sup> were utilized to discover if the participant was correctly interpreting certain words and phrases, to assess if additional survey items were needed, and to determine if any items needed to be reworded. Revisions to the survey items were made based on an aggregate of comments received during the interviews. The items were then evaluated for readability using the Gunning Fog Index. The Gunning Fox index estimates that the instrument is just below an 8<sup>th</sup> grade reading level. The university's Institutional Review Board approved this study.

### 4.4 Results

Based on the process described above, 54 items were generated that required either categorical yes/no or Likert scale responses.

4.4.1 Literature review

Common themes identified through the literature process to have an influence on breastfeeding behavior were organized into four areas which served as the basis for instrument subscales: (a) company policies/work culture, defined as perceptions of support provided at the organizational level and perceptions about the perceived appropriateness of breastfeeding in the workplace, (b) manager support, defined as perceptions of support provided by a woman's immediate manager, (c) coworker support, defined as perceptions of support

provided by a woman's coworkers, (d) workflow, defined as perceptions of available time and perceived ability to make use of given time.

Survey items were written in order to collect information on specific factors found within the literature to affect women's breastfeeding decisions. These items addressed issues such as: perception of the workplace as a social acceptable environment for breastfeeding (Cardenas & Major, 2005; Rojjanasrirat, 2004), flexible scheduling (Cardenas & Major, 2005; Rojjanasrirat, 2004; Taveras et al., 2003), having a place for expressing breast milk that provides sufficient privacy (Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; Rojjanasrirat, 2004; Taveras et al., 2003), adequacy of breaks (Cardenas & Major, 2005; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; Taveras et al., 2003), availability of storage for expressed breast milk (Cardenas & Major, 2005; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993), knowledge that other employees or managers had breastfed at the workplace (Rojjanasrirat, 2004), manager (Bridges, Frank, & Curtin, 1997; Brown, Poag, & Kasprzycki, 2001; Cardenas & Major, 2005; Libbus & Bullock, 2002; Rojjanasrirat, 2004) and coworker (Cardenas & Major, 2005; Rojjanasrirat, 2004; Gerard H. Seijts, 2004) (Gerard H. Seijts, 2004) attitudes and support, and company-provided accommodations for expressing breast milk (e.g. lactation programs, pumping rooms and equipment) (Cardenas & Major, 2005).

### 4.4.2 Expert review

A review by experts (n=11) resulted in one subscale and twelve new survey items being added to the instrument (see Table 4). A majority of the

experts indicated that the physical environment (e.g. proximity to the breastfeeding space) was not adequately addressed therefore a fifth subscale: physical environment of the workplace, defined as *perceptions of the availability/accessibility and adequacy of the space used for breastfeeding (expressing breast milk)* was added. Survey items were then written for the new subscale. A majority of the experts also commented that the instrument lacked items related to possible negative consequences of breastfeeding in the workplace. Therefore, survey items related to negative comments or resentment by coworkers and possible negative repercussions by the company were added. Additionally, several experts felt it would be beneficial to ask about company provided breastfeeding pumps. Overall, the experts commented that the subscales and survey items comprehensively covered issues relevant to breastfeeding experiences in the workplace.

Subscale	New items	Reason new item(s) was created
Company policies and work culture	My job could be at risk (e.g. lose my job or get fewer scheduled hours) if I breastfed or pumped breast milk at work.	Two new survey items were added to address possible negative consequences in the workplace
	My opportunities for job advancement would be limited if I breastfed or pumped breast milk at work.	
	My company would supply the equipment I would need for pumping breast milk at work.	One new item was added to address company supplied breast pumps

**Table 4**: A review by experts resulted in the addition of one new subscale and twelve new items within the five subscales.

Table 4 con't		
Manager support	My manager would think I couldn't get all my work done if I needed to take breaks for breastfeeding or pumping breast milk.	Two new survey items were added to address negativity towards breastfeeding employees from managers
	My manager would consider breastfeeding at work a personal choice, not something he/she should have to deal with.	
Coworker support	My co-workers would think less of workers that choose to breastfeed or pump breast milk at work.	Two new survey items were added to address negativity towards breastfeeding employees from coworkers
	My co-workers would think they are inconvenienced if I took time to breastfeed or pump breast milk.	
Physical environment of the workplace <sup>1</sup>	The designated place for breastfeeding or pumping breast milk at work would be available when I needed it. <sup>2</sup>	Five new items were added to address the physical environment of the workplace

<sup>1</sup> This subscale, physical environment of the workplace, was added based on reviews by experts. <sup>2</sup> This is one example of the five items that were added to address this subscale.

# 4.4.3 Interviews

Fourteen one-on-one interviews were conducted. All of the interview

participants had given birth in the last year, were currently breastfeeding, had

returned to work full-time ( $\geq$  32 hours per week) by the time their child was three

months old, and were employed in a non-managerial position. An examination of

the comments from both the open-ended interviews and cognitive testing of the

survey items revealed that no additional subscales were necessary. However, based on participant comments survey items were added to four of the five subscales to cover issues not previously addressed and 15 of the survey items were reworded to increase clarity of meaning.

Table 5 shows six addition survey items added to address (a) time spend away from the worksite, (b) availability of breastfeeding breaks for those women without scheduled break times, (c) verbal support of breastfeeding by coworkers, (d) the perceived adequacy of the breastfeeding space, (e) perceptions that expressing breast milk at work for later use would be considered more acceptable than having a child brought to the workplace for breastfeeding, and (f) other breastfeeding women at the workplace.

Subscale	New items	Reason new item(s) was created	
Company policies and work culture	My company would accept me pumping breast milk at work, but would disapprove of me breastfeeding my child at work.	Added to address the difference between expressing breast milk for later use, and feeding directly from the breast	
	I'm certain co-workers have breastfed or pumped breast milk at my workplace.	Added to address perceived acceptability of breastfeeding	
Workflow	My job includes travel or time away from my company, making it difficult to breastfeed or pump breast milk.	Added to address jobs that include substantial time away from the worksite	
	Some days I would need to skip a breastfeeding or pumping session because my workdays are so hectic.	Added to address work schedules that do not include scheduled breaks	
Coworker support	My co-workers say things that make me think they support breastfeeding.	Added to assess verbal support of breastfeeding	
Physical environment of the workplace	The designated place for breastfeeding or pumping breast milk includes everything I need.	Added to address the adequacy of the facility	

**Table 5**: One-on-one interviews resulted in the addition of six new items within four of the five subscales.

Table 6 shows 15 survey items that were reworded. For example, two items were reworded to include a definition to increase understanding of a term (e.g. 'job of risk' was defined as "lose my job or get fewer scheduled hours"). Some of the wording changes were done to increase consistency of wording throughout the instrument, for example all of the survey items ending in "during work hours" were changed to "at work". A few items were reworded to be more general (e.g. I would feel comfortable asking for a place..." was reworded as, "I would feel comfortable asking for accommodations...") and a few items were reworded to be more specific (e.g. "I could adjust my work schedule..." was reworded as, "I could adjust my break schedule..."). Some of the items were reworded to more accurately reflect how the participants felt about their breastfeeding experience, for example "My workplace is too fast paced to allow for breastfeed or pump breast milk" was changed to "Some days I would need to skip a breastfeeding or pumping sessions because my workdays are so hectic". No items were consistently identified by the interview participants as needing a 'neither agree or disagree' option; therefore, the survey will remain a 4-point Likert scale in order to increase the response rate for each individual item.

Additionally, based on comments received during the interviews, it was determined that four of the survey items did not fit the structure of a Likert scale. These items were moved to a separate categorical yes/no area. These four items assessed whether or not the participant had a designated facility for breastfeeding and access to equipment for pumping breast milk.

**Table 6**: One-on-one interviews resulted in the rewording of fifteen items within the five subscales.

## Subscale - Company policies and practices

OriginalI would have enough time off after delivery to get breastfeedingitem:started before going back to work.RewordedI would have enough maternity leave (paid and/or unpaid time off)item:to get breastfeeding started before going back to work.

# Table 6 con't

Original item:	My job would be at risk if I breastfed or pumped breast milk at work.
Reworded item:	My job could be at risk (e.g. lose my job or get fewer scheduled hours) if I breastfed or pumped breast milk at work.
Original item:	I would feel comfortable asking for a place to breastfeed or pump breast milk at work.
Reworded item:	I would feel comfortable asking for accommodations to help me breastfeed or pump breast milk at work.

# Subscale - Workflow

Original item:	My breaks are often enough for breastfeeding or pumping breast milk.
item:	milk.
Original item:	I have enough time during my breaks to breastfeed or pump breast milk.
Reworded item:	My breaks are <u>long enough</u> for breastfeeding or pumping breast milk.
Original item:	My workplace is too fast paced to allow for breastfeeding or pumping breaks.
Reworded item:	Some days I would need to skip a breastfeeding or pumping session because my workdays are so hectic.
Original item:	I could adjust my work schedule in order to breastfeed or pump breast milk.
Reworded item:	I could adjust my break schedule in order to breastfeed or pump breast milk.
Original item:	My job duties would prevent me from having time to breastfeed or pump breast milk.
Reworded item:	My job includes travel or time away from my company, making it difficult to breastfeed or pump breast milk.
	Subscale - Manager support
Original item:	My boss would support me breastfeeding or pumping breast milk during work hours.
Reworded item:	My manager would support me breastfeeding or pumping breast milk at work.
Original item:	My boss would consider it his/her responsibility to help me combine breastfeeding and work.

# Table 6 con't

Reworded item:	My manager would consider it part of his/her job to help me combine breastfeeding and work.	
Original item:	My boss would think poorly of workers who choose to breastfeed or pump during work hours.	
Reworded item:	My manager would think less of workers who choose to breastfeed or pump breast milk at work.	
Original item:	My boss would help me manage my workload so I could breastfeed or pump breast milk at work.	
Reworded My manager would help me deal with my workload so I could item: breastfeed or pump breast milk at work.		
	Subscale - Coworker support	
Original item:	My coworkers would think poorly of workers who choose to breastfeed or pump during work hours.	
Reworded item:	My coworkers would think less of workers who choose to breastfeed or pump breast milk at work.	
	Subscale – Physical environment of the workplace	
Original item:	There are too many other women using the breastfeeding or pumping space.	
Reworded item:	The designated place for breastfeeding or pumping breast milk at work would be available when I needed it.	
Original item:	The place for breastfeeding or pumping breast milk is adequate.	
Reworded item:	The designated place for breastfeeding or pumping breast milk is satisfactory.	

#### 4.5 Discussion

The new instrument was designed to assess the level of breastfeeding support perceived by women to exist in their workplace. The three steps conducted to design the instrument provide evidence that the survey items are appropriate measures of workplace breastfeeding support, and therefore the instrument is suitable to subsequently be piloted with a sample of the target population

The first step in this phase of developing the instrument used the social ecological model to bring together research taken from diverse areas of research. This allowed for the survey items to address not only specific facilitators and barriers found within the breastfeeding literature, but also to address issues from the perceptive of work climate literature (e.g. perceived appropriateness of breastfeeding in the workplace). The result of this review, are similar to the results of a study conducted by Johnston and Esposito (Johnston & Esposito, 2007). Johnston and Esposito conducted a review of the literature to describe facilitators and barriers to breastfeeding for at least six months by working women in the United States. Similar to the process used in our study, Johnston and Esposito used the ecological framework, as applied to the workplace, to extract data from the literature. Results of Johnston and Esposito's study revealed that facilitators and barriers of breastfeeding could be grouped into the categories of workplace environment (e.g. social support in the workplace and support from workplace supervisors), time and timing (e.g. maternity leave, required time on the job, flexible scheduling at work), instrumental support in the workplace (e.g. child care and the equipment and physical design of the setting), and policies on breastfeeding. The categories discovered in their review therefore are very similar to the categories developed for our instrument subscales, which supports that our instrument has appropriate content to assess the workplace climate for breastfeeding support from the viewpoint of new mothers.

The reviews by experts provided additional evidence that the newly developed instrument covers topic areas relevant to the target population and

therefore is appropriate for piloting with the target population. Expert review is important to ensure that the content of the instrument is appropriate and that the items are worded in a way such that all participants easily understand them. The experts were useful in this study because many of them had practical experience with breastfeeding mothers in a wide variety of settings, which allowed them insight into what issues where important to include on the instrument.

Cognitive interview techniques have increasing been used within the field of instrument design to improve the wording of survey questions (Willis, 1994). Cognitive methods such as "think-aloud" and verbal probing help researchers to understand the response process used by the target population when answering survey items (Willis, 1994). This helps to reword vague or confusing survey items so that they will be understandable to the target population. In this project, the use of cognitive interviews was crucial for finalizing survey items before use in the piloting phase. Despite scrutiny of the literature and reviews by experts, the one-on-one interviews revealed that some issues were still not being addressed and that several of the items should be reworded to increase clarity. Survey items added to address participant comments included issues such as travel away from the worksite, which may not be addressed in a typical lactation worksite support program. Additionally, valuable feedback was received during the interviews on wording changes that needed to be made to individual survey items, by allowing the participants to talk through what each statement meant to them, and having them discuss the thought processes involved in answering each of the items.

Although, many of the wording changes were subtle, they helped to increase consistency throughout the instrument and improved clarity for all participants. When developing a quantitative instrument specific guidelines must be followed to ensure that the instrument is suitable for the purpose intended. Information gathered from the three steps (review of the literature, expert input, and one-onone interviews) provides evidence that the instrument will perform as intended, which will provide an accurate reflection of women's perceptions of workplace breastfeeding support. A copy of the instrument can be obtained from the second author.

## 4.6 Conclusion

Working women face unique challenges when trying to continuing breastfeeding while employed full-time outside of the home. Research is needed to evaluate which specific components of worksite lactation programs are most beneficial for increasing breastfeeding duration among women working full-time, such that more effective interventions, or lactation support programs, may be developed to improve breastfeeding rates of working women. Research in this area would be improved by the availability of an instrument that accurately reflects those issues most relevant to the target population of new mother employees. The initial steps in instrument development reported in the study demonstrate the suitability of the new instrument for piloting with the target population, which is reported elsewhere. Taken together, these studies indicate

the appropriateness of this new instrument for gathering accurate data on the workplace climate for breastfeeding support.

# 4.7 Acknowledgements

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# 4.8 Reprint information

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## **CHAPTER 5**

# "Assessing the Validity of Measures of an Instrument Designed to Measure Employees' Perceptions of Workplace Breastfeeding Support."

#### 5.1 Abstract

Breastfeeding rates among working mothers are lower than among mothers who are not employed. An ecological framework suggests that health behaviors, such as breastfeeding, are influenced by intrapersonal and environmental factors. There is no existing instrument to measure women's perception of the workplace environment in providing breastfeeding support. The objective of this study was to pilot an instrument measuring perceptions of the work climate for breastfeeding support among working women. Data were collected from self-administered mailed questionnaires filled out by 104 pregnant or women that had recently given birth and were employed and breastfeeding. Dimensionally analyses supported the two dimensional model suggested by the literature. Internal consistency reliability coefficients were high (near .90), and the correlation between the subscales was moderately strong (.68). Only a single item exhibited misfit to the scaling model, and that item was revised after review.

## 5.2 Introduction

Research shows that breastfed infants have decreased incidence and severity of many infectious diseases including diarrhea, (Heinig, 2001; Raisler, Alexander, & O'Campo, 1999) respiratory tract infections, (Bachrach, Schwarz, &

Bachrach, 2003; Oddy et al., 2004) and otitis media, (Ball & Wright, 1999; Dewey, Heinig, & Nommsen-Rivers, 1995) when compared to infants fed commercially prepared infant formula. Although most women giving birth in the United States begin breastfeeding, a majority of them do not continue for as long as recommended. In 2004, 74% of women began breastfeeding, but only 41.5% continued through six months. ("Breastfeeding: Data and Statistics: Breastfeeding Practices — Results from the National Immunization Survey", 2004) Breastfeeding rates are even lower among women who work full-time. ("Breastfeeding Trends Through 2002", 2003; , Global Strategy for Infant and Young Child Feeding, 2003; McKinley & Hyde, 2004; Visness & Kennedy, 1997) One potential explanation for the lower breastfeeding rates among working women is that employees who are new mothers do not perceive the work environment, or climate, as being supportive of breastfeeding. (Cardenas & Major, 2005; Rojjanasrirat, 2004) The work climate, defined as "shared perceptions of organizational policies, practices, and procedures, both formal and informal", (Schneider, 1990) influences which behaviors are viewed as acceptable in the workplace. Studies have suggested elements of the workplace environment that may encourage breastfeeding, including: flexible scheduling, (Cardenas & Major, 2005; Rojjanasrirat, 2004; Taveras et al., 2003) having a place for expressing breast milk that provides sufficient privacy, (Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; Rojjanasrirat, 2004; Taveras et al., 2003) adequacy of breaks, (Cardenas & Major, 2005; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993; Rojjanasrirat, 2004; Taveras et al., 2003) availability of

storage for expressed breast milk, (Cardenas & Major, 2005; Hills-Bonczyk, Avery, Savik, Potter, & Duckett, 1993) knowledge that other employees or managers have breastfed at the workplace, (Rojjanasrirat, 2004) and companyprovided accommodations for expressing breast milk (e.g. lactation programs, pumping rooms and equipment). (Cardenas & Major, 2005) Research also demonstrates that manager (Bridges, Frank, & Curtin, 1997; Brown, Poag, & Kasprzycki, 2001; Cardenas & Major, 2005; Libbus & Bullock, 2002; Rojjanasrirat, 2004) and coworker attitudes and support (Cardenas & Major, 2005; Rojjanasrirat, 2004; Gerard H. Seijts, 2004) play an important role in whether or not women continue to breastfeed after returning to work. Studies focusing on this issue have used a variety of methodologies, such as interviews (retro- and prospective), (Auerbach, 1984; Taveras et al., 2003) selfadministered questionnaires, (Cohen & Mrtek, 1994; Ortiz, McGilligan, & Kelly, 2004) or secondary data analysis. (Cardenas & Major, 2005) The Breastfeeding Attrition Prediction Tool (BAPT), an instrument that has been used in a number of studies, quantifies women's risk for early weaning at the time a new mother leaves the hospital after delivery. (Dick et al., 2002) The BAPT, however, does not focus on breastfeeding issues in the workplace. The authors designed an instrument to elucidate causes of breastfeeding attrition among working women by capturing women's perceptions of workplace breastfeeding support. Data from this instrument may be used to assist in the development of more effective worksite lactation support programs, resulting in higher rates of breastfeeding among working mothers. This study reports validity evidence of the measures

included in this newly developed instrument, the Employee Perceptions of Breastfeeding Support Questionnaire, or EPBS-Q.

#### 5.3 MATERIALS AND METHODS

#### 5.3.1 Study Design

The 117 women included in the study were pregnant or had given birth in the last year, worked in a non-managerial position, and had either returned or planned to return to full-time work ( $\geq$  32 hours per week) by the time their child was three months old. An attempt was made to recruit women from industries known to have family-friendly policies (to increase the likelihood of having measurable breastfeeding support), (Burke, 2005) and having headquarters or single locations in the State of Michigan (in order to minimize company differences based on site location). Surveys were mailed to women who agreed to participate; those not responding were contacted with two follow-ups. Women received a gift certificate upon return of a completed survey. A total of 104 questionnaires were completed and returned (89% response rate).

# 5.3.2 Subjects

Table 7 summarizes the demographic characteristics of the 104 participants. The sample was racially diverse, but tended to be older, had attained higher levels of education, and had higher income than the general population. Ninety-one percent of the subjects were married or living with a partner and the

remainder were single. Eighty-five percent of the subjects had previous breastfeeding experience, and at the time of the study 48% of the women were currently breastfeeding. Most of the subjects (67%) had worked at their place of employment for five years or less, and 96% worked 32 or more hours per week. Fifty-two percent were salaried with the remaining being hourly workers – of these 34% were in a union. Forty-two percent had a male manager and 58% a female manager. Thirty-six percent of the women worked in public education, 27% in health care, and 13% worked for the state or federal government. The rest of the respondents (24%) worked in the communications field; in the corporate offices of a large manufacturing company; or for finance, real estate, or insurance companies.

Variable	Level	Statistic
Race	White	81%
	African American	8%
	Asian	5%
	Hispanic	3%
	Other	3%
Age		Min = 20
_		Mean = 30.5
		Max = 40
Education Level	High School	2%
	Some College	17%
	College Degree	39%
	Post-Graduate Degree	41%
Income	≥ \$60,000	52%
	\$30,000 - \$59,000	36%
	<u>≤</u> \$29,000	12%

Note: N = 104

#### 5.3.3 Measures

Items for the EPBS-Q were developed based on information from several sources: review of the literature, expert input (the 11 experts included practitioners with credentials and experience in the lactation field and researchers in evaluation design or lactation), and 14 one-on-one interviews which employed cognitive interview techniques with women who had breastfed while employed. Based on these initial efforts, 54 items were generated that required either categorical yes/no or Likert scale responses. Survey items were grouped together based on the specific aspect of the work climate being evaluated: company (e.g. "I would feel comfortable asking for accommodations to help me breastfeed or pump breast milk at work"), manager (e.g. "My manager would help me deal with my workload so I could breastfeed or pump breast milk at work."), coworkers (e.g. "My co-workers would think less of workers that choose to breastfeed or pump breast milk at work"), workflow (e.g. I could adjust my break schedule in order to breastfeed or pump breast milk."), or physical environment (e.g. "I would feel comfortable breastfeeding or pumping breast milk in the designated place."). A copy of the instrument can be obtained from the third author. Based on pilot test item analyses and content considerations, 13 of the items were removed from the initial item pool leaving a total of 41 items on the EPBS-Q.

# 5.3.4 Scaling

Data were initially scaled with the Multidimensional Random Coefficients Multinomial Logit Model, (Adams, Wilson, & Wang, 1997) a multidimensional extension of the Rasch measurement model, (Rasch, 1980) as implemented in the

*Conquest* computer program. (Wu, Adams, & Wilson, 1998) This logistic latent trait model assumes that multiple traits (specified by the analyst) underlie a mother's response to each item. Application of this model to our data results in an estimate of each mother's perceived level of support on each dimension being measured and each item's perceived availability in the work place. Agreement between model-based expected values and observed responses served as the basis for evaluating the dimensionality of the measures.

The fit of two substantive models to these data was evaluated: (a) a twodimensional model based on the components of company polices/work culture, defined as perceptions of support provided at the organizational level and perceptions about breastfeeding (expressing breast milk) being considered socially acceptable in her workplace, and manager/coworker support, defined as perceptions of support provided by a woman's immediate manager and her coworkers (D2) and (b) a three-dimensional model based on the components of time, defined as perceptions of available time and perceived ability to make use of given time, support, defined as perceptions of breastfeeding support available from her company, from her manager, her coworkers, and from the physical environment and accommodations of her workplace, and acceptability, defined as perceptions about breastfeeding (expressing breast milk) being considered socially acceptable in her workplace. (D3). In addition, we considered two comparison models; a unidimensional model (D1) and a two-dimensional model that scaled positively coded items versus negatively coded items as separate dimensions (DPN). The relative fit of the data to each of these models was evaluated using the Schwartz's

Bayesian Information Criterion (BIC) (see Appendix B), which transforms the deviance statistic ( $G^2$ ) by imposing a correction that takes into account the number of parameters estimated for the model in question and penalizes free parameters more strongly than does the frequently cited Akaike Information Criterion. Generally, smaller values of the BIC index indicate better fit of the data to the model.

After identifying the best fitting model from these options, we scaled the data from each subscale separately to the Rasch model (Rasch, 1980) using the Winsteps software (Linacre, 2007) and examined several indices relating to the quality of the measures produced for each subscale (The complete data output for Dimension 1 and Dimension 2 is located in Appendix B). First, we examined the reliability of separation index for each scale specified in the model that we adopted. The reliability of separation is an index that is a latent trait modeling analog to coefficient alpha computed as  $Rel_{\theta} = [1 - MSE_{\theta}]/V(\hat{\theta})$ , where  $MSE_{\theta}$  is the mean of the squared errors of the mother trait estimates and  $V(\hat{\theta})$  is the variance of those estimates. Second, we examined unweighted mean-squared fit index for each item, which equals the average squared standardized residual of mothers' ratings from the Rasch model expectations. The mean-squared fit indices can be standardized  $(Z_{unweighted})$  to facilitate interpretation so that positive values indicate that the amount of variability between observed and expected ratings is greater than that predicted by the model. For this study, item fit indices with values greater than 2.0 were considered to be evidence of model-to-data misfit. Third, we examined the correlation between the ratings assigned by

mothers to each item and the mother measures ( $r_{item-measure}$ ), an index that is analogous to the raw item score-total score correlation (AKA the point-polyserial correlation). Near zero values of this correlation indicate items that may not be adequate measures of the underlying dimension that the item was designated to measure. In our analyses, items were flagged if this correlation was less than .30. Fourth, we examined the correlations between mother trait estimates on the subscales.

#### 5.4 Results

Table 8 summarizes the dimensionality analyses. The models are presented from the simplest (D1) to the most complex (D3) from the top to the bottom of this table, and the Deviance statistic (smaller values indicate better model-to-data fit) for Model D2 has the smallest value. Similarly, the value of the BIC transformation of the Deviance statistic (which penalizes models that contain more parameters—leveling the playing field between more complex and simpler models), indicates that D2, which differentiates between company policies/work climate and manager/coworker support, exhibits the best fit to the observed data. Overall, the table indicates that the two-dimensional substantive model better explained the observed data than did the unidimensional model (D1) or the threedimensional model (D3). In addition, D2 performed slightly better than the model that differentiated positive and negative items (DPN). This fact is important because it indicates that (a) the substantive distinctions upon which the items were developed were realized in the relationships between items and (b) the fact that

negatively polarized items included in the item pool did not interfere with measurement of the intended constructs, as sometimes happens. (Barnette, 1999)

Model	Deviance	Parameters	BIC
D1	8709.75	51	8812.61
D2	8602.31	53	8709.21
DPN	8652.74	53	8759.64
D3	8614.79	56	8862.74

 Table 8. Dimensionality Statistics

Note: N = 104. BIC = Bayesian Information Criterion

Table 9 displays the subscale reliability of separation indices and the subscale correlations. The reliability of separation indices, measures of internal consistency, are generally high, and the correlation between the Rasch model scaled mothers' measures are moderately high.

Table 9. Subscale Correlations and Reliabilities

	Dimension 1	Dimension 2
Dimension 1	.87	
Dimension 2	.68	.89

Note: N = 104. Diagonals show reliability of separation. Dimension  $1 = \text{company policies/work culture and contains 23 items. Dimension <math>2 = \text{manager/coworker support and contains 18 items.}$ 

Table 10 summarizes the item quality indicators for each subscale. This table provides the range and average values of the unweighted mean-squared fit statistics (an indicator of how well responses to each item conform to the expected values of the Rasch model) and item-measure correlations (an indicator of the consistency of responses to a particular item to the composite of the responses to the remaining items on the subscale) and indicates how many items

were flagged based on the criterion values identified in the Method section. These statistics reveal that the items on both dimensions exhibited reasonably good fit to the Rasch model, with only one item being flagged for misfit—Item 20, which measured manager/coworker support. In addition, the table shows that each item exhibited reasonably high levels of agreement with the remaining items on the relevant subscale. Specifically, the item-measure correlations tended to be fairly high for all items. Three items from Dimension 1 were flagged for somewhat low item-measure correlations, but further examination revealed that these items were among the easiest and most difficult to endorse—a characteristic that attenuates item-measure correlations toward zero.

Index	Statistic	Dimension 1	Dimension 2
Zunweighted	Min	-2.00	-1.90
0	Mean	0.10	0.00
	Max	1.20	4.60
	% > 2.00	0	6
r <sub>item-measure</sub>	Min	.22	.36
	Mean	.47	.60
	Max	.71	.74
	% < .30	13	0

Table 10. Summary of Item Quality Indicators

Note: Dimension 1 = company policies/work culture and contains 23 items. Dimension 2 = manager/coworker support and contains 18 items.

#### 5.5 Discussion

Results of our study suggest that measures from the EPBS-Q may be useful indicators of a breastfeeding woman's perceptions of the work climate. Our analyses provide evidence to support the validity of measures of two constructs related to the work climate for breastfeeding support: company policies/work culture and manager/coworker support. Our results indicate that measures from these two subscales exhibit sufficient internal consistency (i.e. have high reliabilities) for use in research and program evaluations. In addition, the correlation between measures from the two subscales indicate that the measures are not redundant in the information that they provide about mothers the subscales have only about 46% of their variance in common. Not only do our results indicate that measures from both subscales are reliable, but they also demonstrate that each subscale provides unique information about women's perceptions of the work climate for breastfeeding support, allowing researchers to understand and differentiate between issues relating to the employment setting versus the people in that setting.

In addition, our results demonstrate that the items are good indicators of these traits. Only a single item—Item 20, which measured manager/coworker support—exhibited misfit. Typically, items flagged for misfit are scrutinized to see whether there are substantive reasons to omit or revise the item. The wording of this item, "My manager would consider breastfeeding at work a personal choice, not something he/she should have to deal with", required participants to think of the issue from the viewpoint of her manager. Clearly, this item is worded in a manner that requires women to speculate about the thinking of their managers. Because the inclusion of this item is warranted based on results of prior research, (Dunn, Zavela, Cline, & Cost, 2004) we recommend that the text of the item be revised rather than omitting the item. To remove the uncertainty of

requiring the employee to comment on what may be unspoken attitudes of the employer, the item has been reworded as, "I feel breastfeeding would be viewed as a personal choice by my manager", to depict the viewpoint of the woman instead of the viewpoint of the manager.

#### 5.6 Conclusion

Employer-sponsored lactation support programs, in general, have been shown to increase rates of breastfeeding duration. However, these programs vary in the amount and types of support offered. In addition, evaluations of these programs have used different instrumentation to measure outcomes, (Cohen & Mrtek, 1994; Katcher & Lanese, 1985; Ortiz, McGilligan, & Kelly, 2004) making it difficult to determine which components are most influential in helping women continue breastfeeding while employed. Our goal was to create an instrument that could be used to gather relevant data in a standardized manner that could be replicated across studies and across employment contexts. Use of an instrument like the EPBS-O to measure program effectiveness may lead to a better understanding of the components of effective programs because the EPBS-Q can be used to gather comparable data from a variety of workplace settings, giving a more robust assessment of which specific components of a worksite lactation program are most beneficial to women. More important is the fact that the data will be collected from the people impacted by such programs-new mother employees who wish to combine breastfeeding and employment.

The evidence provided in this article suggests that the EPBS-Q measures are valid for use in populations similar to those used in this study. Future research is needed before this instrument is used with other populations, and such a study should also aim to verify that the revised Item 20 functions as intended. In addition, evidence of the relationship of EPBS-Q measures to external measures of program effectiveness is needed.

## 5.7 Acknowledgments

This project was funded by the Michigan State University FACT Coalition and the National Research Initiative of the USDA Cooperative State Research, Education and Extension Service, grant number #2006-35215-16703.

# 5.8 Reprint information

Request for reprints should be sent to Dr. Beth Olson, Department of Food Science and Human Nutrition, Michigan State University, East Lansing, MI 48824, e-mail: olsonbe@msu.edu APPENDICES

APPENDIX A
#### **RECRUITMENT FLYER**



#### **PHONE SCREENER**

Great, this will only take a few minutes.

Do you voluntarily agree to participate in this study?

Yes \_\_\_\_\_ No \_\_\_\_\_

If no, thank you for your time.

Now I have some questions about you and your child.

Are you 18 years old or older?	Yes		No	
Are you in a managerial position at work?	Yes		No	
(If yes, skip to the ineligibility statement.)				
Do you work in a private office with a doo	r?Yes		No	
(If yes, skip to the ineligibility statement.)				
Have you had a child in the last year?	Yes		No	
After the baby was born, did you go back t	o work : Yes	full-time (3	32+ hours/week)? No	
(If no, skip to the ineligibility statement.)				
Did you ever breastfeed this child?	Yes		No	
If no:				
At any point before or during your breastfeeding?	pregnan	cy did you	consider	
At any point before or during your breastfeeding?	pregnan Yes	cy did you	consider No	
At any point before or during your breastfeeding? What was the main (or one) reason	pregnan Yes you dec	cy did you 	consider No breastfeed?	
At any point before or during your breastfeeding? What was the main (or one) reason Was returning to work full-time a febreastfeed?	pregnan Yes you dec	cy did you  ided not to your decis	consider No breastfeed? ion not to	
At any point before or during your breastfeeding? What was the main (or one) reason Was returning to work full-time a fabreastfeed? (If no, skip to the ineligibility statement.)	you dec	cy did you  ided not to your decis	consider No breastfeed? ion not toNo	
At any point before or during your breastfeeding? What was the main (or one) reason Was returning to work full-time a fabreastfeed? (If no, skip to the ineligibility statement.) Additional comments:	yes you dec	cy did you  ided not to your decis	consider No breastfeed? ion not to No	]

#### If yes:

Г

When did you de	cide you wanted to breastfeed, be	fore you were	
pregnant?	when you were pregnant?	or after delivery?	

What was the main (or one) reason you decided to breastfeed?

Are you still breastfeeding this child?	Yes	No	

If no,

How long did you breastfeed this child? \_\_\_\_\_ (weeks/months)

When you stopped breastfeeding, was going back to work a factor in your decision?

Yes \_\_\_\_\_ No \_\_\_\_\_

Additional comments:

Thank you for your time, unfortunately you do not meet the criteria to be included in the study.

OR

Thank you for your time. At this time, I would like to set up a time for us to meet so that you can participate in the study.

 Date \_\_\_\_\_
 Time \_\_\_\_\_
 Place \_\_\_\_\_

Thank you for your time, I look forward to meeting with you on (date) at (time) at (place).

Based on the following criteria I accept the participant:

#### **INFORMED CONSENT – COGNITVE INTERVIEWS**

Michigan State University (MSU) is doing a research study about breastfeeding support in the workplace. We hope to learn how women, that have recently had a baby and returned to work, feel about the level of support provided by their workplace. Because you are pregnant and plan to breastfed after you return to work or you have had an infant in the last year and breastfed, we are asking for your help in this study.

About this study:

• Being in this study includes reading and answering questions on a survey (takes about 30 minutes) and being asked to talk about thoughts you had while answering the questions (takes about 30 minutes). All discussion will be audio taped.

• You do not have to be in the study. You can stop at any time with no consequences for you.

• All of the information you share will be kept private. Only the researchers will see the information. Your name will not be on the survey. The cassette tapes will be typed into a printed copy and the tapes will be destroyed. Your name will not be on the tape or the written copy.

• We will follow all laws that protect your privacy. We will share results of the study in group form only.

• We do not expect that being in the study will harm you in any way. The information you share may help improve support for new mothers that are working and breastfeeding.

• When you finish the study, you will receive a \$20.00 gift certificate.

If you have any questions about this study contact Beth Olson, PhD: (1-517-355-8474 extension 113) Department of Food Science and Human Nutrition, Michigan State University, 2112 Anthony Hall, E. Lansing, MI 48824, email at <u>olsonbe@msu.edu</u>.

If you have any questions about your rights as a human subject contact Peter Vasilenko: (1-517-355-2180), Chair of the University Committee on Research Involving Human Subjects, 202 Olds Hall, Michigan State University, E. Lansing, MI 48824, email at ucrihs@msu.edu. You do not have to give your name.

I voluntarily agree to participate in this study.

Participant's printed name

Participant's signature

Date

I voluntarily give my permission to be audio taped during the study.

Participant's printed name

Participant's signature

Date

Researcher's printed name

Researcher's signature

Date

#### **INFORMED CONSENT – PILOTING**

Michigan State University (MSU) is doing a research study about breastfeeding support in the workplace. We hope to learn how women who are pregnant or who have recently had a baby and returned to work, feel about the level of support provided by their workplace. Because you are pregnant and plan to breastfed after you return to work or you have had an infant in the last year and breastfed, we are asking for your help in this study.

About this research study:

- Being in this study includes reading and answering questions on a survey (it should take you about 30 minutes to complete the study)
- You do not have to be in the study. You can stop at any time with no consequences for you.
- All of the information you share will be kept private. Only the researchers will see the information. Your name will not be on the survey.
- We will follow all laws that protect your privacy. We will share results of the study in group form only.
- We do not expect that being in the study will harm you in any way. The information you share may help improve support for new mothers that are working and breastfeeding.
- You will receive a \$20.00 gift certificate for your participation.

#### If you have any questions about this research study contact Beth

Olson, PhD: (517) 355-8474 extension 113. Department of Food Science and Human Nutrition, Michigan State University, 2112 Anthony Hall, E. Lansing, MI 48834, email: <u>olsonbe@msu.edu</u>.

If you have any questions or concerns about your rights as a research participant, please feel free to contact Peter Vasilenko, Ph.D., Director of Human Subject Protection Programs at Michigan State University: (517) 355-2180, Fax (517) 432-4503, email: <u>irb@msu.edu</u>, or regular mail: 202 Olds Hall, E. Lansing, MI 48824. You do not have to give your name.

#### I voluntarily agree to participate in this research study.

(Participant's printed name)

<sup>(</sup>Participant's signature)

(Date)

#### **GIFT CERTIFICATE CONFIRMATION FORM**

I received a \$ 20 gift certificate for participation in the employment and breastfeeding study.

Address \_\_\_\_\_

Signed \_\_\_\_\_

Date \_\_\_\_\_

#### **OPEN-ENDED INTERVIEW QUESTION**

Open-ended question (asked verbally and responses audio-recorded):

#### 1. Were you breastfeeding your baby when you returned to work?

(If, yes) Describe your experience combining breastfeeding and work.

#### Probes:

Did you find it easy or difficult to breastfeed at work? Why?

Was there any thing about the people you work with that made it easier or more difficult to breastfeed at work?

Was there anything about the physical environment of your work that made it easier or more difficult to breastfeed at work?

(If, no) Describe your workplace and ways you think it would either support a woman who wanted to continue breastfeeding, and/or ways you think it would discourage that woman.

#### Probes

Were there work related reasons you choose not to breastfeed after returning to work? What were they?

Was there any thing about the people you work with that would have made it easier or more difficult to breastfeed at work?

Was there anything about the physical environment of your work that would have made it easier or more difficult to breastfeed at work?

#### EXPERT REVIEW FORM

Michigan State University Dept of Food Science and Human Nutrition 2125 S. Anthony East Lansing, MI 48823 greenesa@msu.edu

Date

Dear expert reviewer,

Thank you for agreeing to participate in this expert review. As you know, I am developing a survey to evaluate woman's perceptions of breastfeeding support in the workplace. A step in the development process is to allow individuals with experience in the field of lactation to review statements on the survey.

The survey currently contains 50 statements. Women enrolled in the study will be asked to rate statements from strongly agree to strongly disagree. On the survey the women receive, the statements will be grouped in five categories (overall company, time, managers, co-workers, and space). The survey I am sending to you contains the same statements that are on the survey the women will receive; however the layout is different.

For this review the 50 statements have been placed into three categories. These three categories are time, support, and acceptability. I have supplied a definition of each category on the following pages.

#### The purpose of this review is to read the category definition and then evaluate each statement in that category as high, moderate, or low. Your ranking will depend on how well you feel each statement fits the definition for each category.

You may fill out and return this form one of two ways.

1. If you would like to print and mail to me. You may print-out the form, place on x in the appropriate boxes and mail to me.

2. If you would like to fill out on the computer and email back to me. You may double click on the box you would like to check. A text box will appear. Under the option *default value* click on 'checked' to place a check in the box. You can double click on a box to change from checked to not checked or not checked to checked at any time. When you close the text box, a check should appear in the appropriate box. Save the file and then email the form back to me.

Please do not hesitate to call me with any questions you may have. (517) 214-8547 or toll-free at 1-866-552-6521 ext. 154

Sincerely, Sally Greene

1. Please read the definition (below) of time.

2. Read each of the following statements one at a time.

3. Rate each statement as Low, Moderate or High depending on how well you think each statement fits the definition of <u>time</u>.

<u>Time</u> this category includes statements that look at the perceptions women have of the availability of time given by her work (e.g. for breaks, time off after delivery, her workload) and by her perceived ability to make use of the given time.

Statement on woman's survey	Goodness-of-fit for time		
	Low	Moderate	High
I would have enough time off after child is born to get breastfeeding started before going back to work.			
My breaks are frequent enough for breastfeeding or pumping breast milk at work.			
My breaks are long enough for breastfeeding or pumping breast milk.			
I could adjust my work hours to breastfeed or pump breast milk.			
I could adjust my break schedule to breastfeed or pump breast milk.			
I would have time to breastfeed or pump breast milk, which is in addition to regular breaks and mealtimes.			
Some days I would need to skip a breastfeeding or pumping session because my workdays are so hectic.			

- 1. Please read the definition (below) of acceptability.
- 2. Read each of the following statements one at a time.
- 3. Rate each statement as Low, Moderate or High depending on how well you think each statement fits the definition of <u>acceptability</u>.

<u>Acceptability</u> this category includes statements that look at the perceptions women have about the extent to which breastfeeding and/or pumping breastmilk is considered socially acceptable in her workplace.

Statements on woman's survey	Good-of-fit for acceptability		
I'm certain my work has written	Low	Moderate	High
policies about employees that are breastfeeding or pumping breast milk.			
I would be able to continue breastfeeding or pumping breast milk after going back to work.			
My job could be at risk (e.g. lose my job or get fewer scheduled hours) if I breastfed or pumped breast milk at work.			
I would be able to talk about breastfeeding at work.			
I would feel comfortable asking for accommodations in order to breastfeed or pump breast milk at work.			
My opportunities for job advancement would be limited if I pumped breast milk at work.			
I'm certain that women in higher-level positions have breastfed or pumped breast milk at my work.			
I'm certain co-workers have breastfed or pumped breast milk at my work.			

My company would accept me pumping breast milk at work, but would disapprove of me breastfeeding my child at work.

- 1. Please read the definition (below) of support.
- 2. Read each of the following statements one at a time.
- 3. Rate each statement as Low, Moderate or High depending on how well you think each statement fits the definition of <u>support</u>.

<u>Support</u> this category contains statements that include perceptions women have of breastfeeding support available from other employees (co-workers, managers) as well as breastfeeding support provided by the physical environment and accommodations of her workplace.

Statements on woman's survey	Goodness-of-fit for support		
	Low	Moderate	High
I would be able to get information about combining work and breastfeeding from my workplace.			
I'm certain there is a company designated place for women to breastfeed or pump milk during the workday.			
There is someone I could go to at work that would help me make arrangements for breastfeeding or pumping breast milk.			
My boss would support me breastfeeding or pumping breast milk at work.			
My boss says things that make me think he/she supports breastfeeding.			
My boss would consider it part of his/her job to help me combine breastfeeding and work.			
My boss would help me combine breastfeeding and work.			

My boss would make sure my job is covered if I needed time for breastfeeding or pumping breast milk.			
My boss would change my work schedule to allow me time for breastfeeding or pumping breast milk.			
Statements on woman's survey	Goodne	ess-of-fit for suj	pport
	Low	Moderate	High
My boss would help me manage my workload so I could breastfeed or pump breast milk at work.			
My boss would be a source of information on how to breastfeed at work.			
I am certain co-workers would support me breastfeeding or pumping breast milk at work.			
Co-workers say things that make me think they support breastfeeding.			
Co-workers would think they are inconvenienced if I took time to breastfeed or pump breast milk at work.			
Co-workers would cover my job duties if I needed time for breastfeeding or pumping breast milk.			
Co-workers would change break times with me so I could breastfeed or pump breast milk.			
I could buy or borrow the equipment			

My company would supply the equipment I would need for pumping breastmilk at work. I could find a place to store expressed breast milk at work. There is a place I could go to			
I could find a place to store expressed breast milk at work. There is a place I could go to			
There is a place I could go to	_		
breastfeed or pump breastmilk at work.			
Comment: The question above will be answered as YES or NO by the participants. Participants that answer YES will then be asked the following set of questions.			
Statements on woman's survey	Goodness-of- Low Mo	fit for support derate H	igh
The place I would use for breastfeeding or pumping breast milk would be available when I	_		
needed.			
needed. The place I would use to breastfeed or pump breast milk is close enough to my work area to use during my breaks.			
needed. The place I would use to breastfeed or pump breast milk is close enough to my work area to use during my breaks. I would feel comfortable breastfeeding or pumping breastmilk in the available place.			
needed. The place I would use to breastfeed or pump breast milk is close enough to my work area to use during my breaks. I would feel comfortable breastfeeding or pumping breastmilk in the available place. The place for breastfeeding or pumping breastmilk is satisfactory.			
the participants. Participants that answer YES will then be asked the following set of questions.Statements on woman's surveyIThe place I would use forI	Goodness-of- Low Mo	fit for support derate H	ig

Comments

#### **COVER LETTER FOR PILOTING**

Sally Greene Michigan State University Dept of Food Science and Human Nutrition 2125 South Anthony East Lansing, MI 48824-1224 1-866-552-6521 ext 154 FAX: 517-353-6343

January 30, 2007

**Study Participant** 

I am writing to ask your help in a study of new and expectant mothers working outside of the home full-time. This study is part of an effort to learn how new and expectant mothers experience breastfeeding support in their workplace.

It's my understanding that you are pregnant or have had a child within the last year. I am contacting a sample of women from around the state to ask them about their thoughts on combining breastfeeding and working full-time at their place of employment.

Your input will be used to help develop a final survey, which can be used by companies to see how female employees feel about breastfeeding support in their workplace. By understanding how women feel about breastfeeding support, companies can make their services and support as helpful as possible.

Your answers are completely confidential and will be released only as summaries in which no individual's answers can be identified. When you return your completed questionnaire, your name will be deleted from the mailing list and never connected to your answers in any way. This survey is voluntary. However, your experiences and opinions about breastfeeding and working full-time could be very helpful in developing breastfeeding services and support for working women. If for some reason you prefer not to respond, please let me know by returning the blank questionnaire in the enclosed stamped envelope.

I would appreciate if you could return your survey package within 2 weeks of it being received. You will receive a \$20.00 gift certificate as a thank you for your help.

Sincerely,

Sally W. Greene Master's Candidate

#### EMPLOYEE PERCEPTIONS OF BREASTFEEDING SUPPORT QUESTIONNAIRE

#### Breastfeeding and Employment Research Study

# You have been selected to participate in a study conducted by researchers at Michigan State University.

#### Instructions for filling out the survey:

 $\checkmark$  Fill in the box (**•**) to indicate to what extend you agree or disagree with each statement.

 $\checkmark$  To ensure clarity, please <u>do not</u> use a  $\sqrt{}$  or an X.

 $\checkmark$  If you need to change an answer, please make sure that your old answer is either completely erased or clearly crossed out.

✓ Please use a pen (black or blue ink) or a pencil.



For each of the following statements, breastfeeding includes breastfeeding a baby and/or using a breast pump. Please think about each statement as it most applies to you, whether you are pregnant and thought about breastfeeding or if you are currently breastfeeding and/or pumping breast milk.

#### This section asks about the overall support you feel would be provided by your company if you wanted to continue breastfeeding or pumping breast milk after returning to work.

		Strongly agree ▼	Agree ▼	Disagree ▼	Strongly disagree ▼
1.	I would have enough maternity leave (paid and/or unpaid time off) to get breastfeeding started before going back to work.				
2.	I would be able to get information about combining work and breastfeeding from my company.				
3.	I'm certain my company has written policies for employees that are breastfeeding or pumping breast milk.				
4.	I'm certain there is a place I could go to breastfeed or pump breast milk at work.				
5	There is someone Leould as to				

5. There is someone I could go to at work that would help me

	make arrangements for breastfeeding or pumping breast milk.				
6.	I would be able to continue breastfeeding or pumping breast milk after going back to work.				
7.	My job could be at risk (e.g. lose my job or get fewer scheduled hours) if I breastfed or pumped breast milk at work.				
		Strongly agree	Agree	Disagree	Strongly disagree
8.	I would be able to talk about breastfeeding at work.				
9.	I would feel comfortable asking for accommodations to help me breastfeed or pump breast milk at work.				
10.	My opportunities for job advancement would be limited if I breastfed or pumped breast milk at work.				
11.	I'm certain that women in higher-level positions have breastfed or pumped breast milk at my workplace.				
12.	I'm certain co-workers have breastfed or pumped breast milk at my workplace.				
13.	My company would accept me pumping breast milk at work, but would disapprove of me breastfeeding my child at work.				

## This section asks about the pace of your job and available time

14.	My breaks are <u>frequent enough</u> for breastfeeding or pumping breast milk.				
15.	My breaks are <u>long enough</u> for breastfeeding or pumping breast milk.				
16.	I could adjust my work hours in order to breastfeed or pump breast milk.	□ Strongly agree	□ Agree	□ Disagree	□ Strongly disagree
17.	I could adjust my break schedule in order to breastfeed or pump breast milk.				
18.	I would have time to breastfeed or pump breast milk, which is <u>in</u> <u>addition</u> to regular breaks and mealtimes.				
19.	Some days I would need to skip a breastfeeding or pumping session because my workdays are so hectic.				
20.	My job included travel or time away from my company, making it difficult to breastfeed or pump breast milk.				
21.	My job allows me to make my own decisions about how to schedule my work.				
22.	My job allows me to decide on the order in which things are done on the job.				
23.	My job allows me to plan how I do my work.				

## during your workday to breastfeed or pump breast milk.

#### This section asks about the overall support you feel would be provided by your direct manager/supervisor if you wanted to continue breastfeeding or pumping breast milk after returning to work.

		Strongly agree	Agree	Disagree	Strongly disagree
24.	My manager would support me breastfeeding or pumping breast milk at work.				
25.	My manager would help me combine breastfeeding and work.				
26.	My manager would think I couldn't get all my work done if I needed to take breaks for breastfeeding or pumping breast milk.				
27.	I would feel comfortable speaking with my manager about breastfeeding.				
28.	My manager would be a source of information on how to breastfeed at work.				
29.	My manager says things that make me think he/she supports breastfeeding.				

30.	My manager would consider breastfeeding at work a personal choice, not something he/she should have to deal with.				
31.	My manager would consider it part of his/her job to help me combine breastfeeding and work.				
32.	My manager would think less of workers who choose to breastfeed or pump breast milk at work.				
		Strongly agree	Agree	Disagree	Strongly disagree
33.	My manager would make sure my job is covered if I needed time for breastfeeding or pumping breast milk.			•	•
34.	My manager would change my work schedule to allow me time for breastfeeding or pumping breast milk.				
35.	My manager would help me deal with my workload so I could breastfeed or pump breast milk a work.	t 🗆			
36.	My manager would be embarrassed if I spoke with him/her about breastfeeding.				

## This section asks about the overall support you feel would be provided by your co-workers if you wanted to continue breastfeeding or pumping breast milk after returning to work.

37	I am certain my co-workers	0	
57.	i ani certain my co-workers		
	would support me breastfeeding		
	or pumping breast milk at work.		

38.	My co-workers would think of workers that choose to breastfeed or pump breast m work.	less iilk at				
39.	I would feel comfortable speaking with my co-worker about breastfeeding.	rs				
40.	My co-workers say things the make me think they support breastfeeding.	nat				
41.	My co-workers would chang their break times with me so I could breastfeed or pump b milk.	ge that preast				
		Strongly agree	Agree	-	Disagree	Strongly disagree
42.	My co-workers would think they are inconvenienced if I took time to breastfeed or pump breast milk.			•		
43.	My co-workers would cover my job duties if I needed time for breastfeeding or pumping breast milk.					
44.	My co-workers would be a source of information on how to breastfeed at work.					
45.	My co-workers would be					

## NOTE: PLEASE ANSWER QUESTIONS 46 - 49 as YES or NO

Yes No

- 46. I could buy or borrow the equipment I would need for pumping breast milk. □ □
- 47. My company would supply the equipment I would need for pumping breast milk at work.
- 48. I could find a place to store expressed breast milk at work.
- 49. There is a companydesignated place for women to breastfeed or pump milk during the workday.

	7
If yes, go to questi	please on 50

### If you answered YES to QUESTION 49, please answer the following questions.

#### This section asks about the physical environment of your workplace for breastfeeding or pumping breast milk after returning to work.

		Strongly agree	Agree	Disagree	Strongly disagree
50.	The designated place for breastfeeding or pumping breast milk at work would be available when I needed it.	•	•	•	•
51.	The designated place for breastfeeding or pumping breast milk is close enough to my work area to use during my breaks.				
52.	I would feel comfortable breastfeeding or pumping breast milk in the designated place.				
53.	The designated place for breastfeeding or pumping breast milk is satisfactory.				
54.	The designated place for breastfeeding or pumping breast milk includes everything I need.				

APPENDIX B

## **CODING SCHEME FOR VARIABLES**

Demographic	Description	Coding
Variable	-	
Name		
Q1-6, 8, 9,	Normal scoring	1=Strongly agree, 2=agree,
11, 12, 14-18,		3=disagree, 4=strongly
21-25, 27-29,		disagree, .= missing data
31. 33-35. 37.		
39-41, 43, 44		
07-R. 10-R.	Reverse scoring - To score	1=Strongly agree, 2=agree,
13-R. 19-R.	this instrument, you must first	3=disagree, 4=strongly
20-R. 26-R.	reverse score the items for	disagree, .= missing data
30-R. 32-R.	which an (R) is shown after	······································
36-R. 38-R.	them.	
42-R. 45-R		
046-49	Yes/No questions	0=no, 1=ves, .=missing data,
		10=yes and no
O 50-54	Normal scoring	1=Strongly agree, 2=agree,
		3=disagree, 4=strongly
		disagree, .=missing data.
		97=049 is no so skipped
EverBf	Did the respondent ever	$0 = n_0$ , $1 = ves$ , $= missing data.$
	breastfeed?	97=049 is no so skipped
NumBf	How many children has the	0=1, 1=2 or more. =missing
	respondent breastfed?	data. 98=078 is no so
		skipped
BfDur	What is the longest duration a	0 = <1 week, $1 = 1$ wk-6 wks.
	respondent has ever bf?	2=>6 wks- 3 mo. 3=>3 mo -
		6 mo, 4=>6 mo, 98=078 is
		no so skipped, .=missing data
CurBF	Is the respondent currently	0=no, 1=yes, 98=078 is no so
	breastfeeding?	skipped, .= missing data
MilkSup	How does the respondent	0=breastfeeding child.
<b>_</b>	maintain milk supply during	1=express breast milk.
	work hours?	10=breastfeed and express.
		98=Q78 is no so skipped,
		99=081 is no so skipped,
		.=missing data
BFCom	How committed to	0=uncertain, 1=somewhat
	breastfeeding is the	committed, 2=committed.
	respondent?	3=very committed, 98=078 is
		no so skipped, 99=081 is no
		so skipped, .=missing data
EmpLeng	How long has respondent	0=< 6 mo, 1=6-12 mo, 2=>1

	worked for current company	yr-5yrs, 3=>5 yr, .=missing
	-	data
HoursWk	How many hours a week the	0=<32hrs, 1=32-39 hrs, 2=40-
	respondent works.	50 hrs, 3=>50hrs, .=missing
		data
Hr_Sal	Does the respondent get paid	0=hourly, 1=Salary,
	hourly or salary?	.=missing data
Union	Is the respondent a member of	0=no, 1=yes, .=missing data
	a labor union?	
ManGen	What is the gender of the	0=male, 1=female, .=missing
	respondents manager?	data
CoGen	What is the gender of the	0=mostly male, 1=equal
	majority of the respondents	number of male and female,
	coworkers?	2=mostly female, .=missing
		data
LeaveTot	How many total weeks of	0=<6 wks, 1=6-12wks,
	leave did the respondent take?	2=>12 wks, 96=pregnant so
		skipped, .=missing data
PdL	Did the respondent take paid	0=no, 1=yes, 96=pregnant so
	leave?	skipped, .=missing data
PdLTot	How many weeks of paid	0=1-3 wks, 1=4-6wks, 2=7-9
	leave did the respondent take?	wks, 3=10-12 wks,
		4=>12wks, 96=pregnant so
		skipped, 97=Q91 is no so
		skipped, .=missing data
JobTitle	Respondent is asks to write in job title	Write in, .=missing data
WkGp	What type of industry does the	0=Communication,
	respondent work in?	1=Finance, 2=Health Care,
		3=Insurance,
		4=Manufacturing – Salary,
		Public Administration,
		5=Public Administration,
		6=Public Education, 7=Real
		Estate, 8=Utilities, 400=Other
		(write in), .=missing data
EmpNum	How many employees work at	Write in, .=missing data
	the same physical location as	
	the repondent?	
EmpTot	How many employees work at	0=<250, 1=250-499, 2=500-
	the respondents company at all	1000, 3=>1000, .=missing
	locations?	data
EthnicGp	Is the respondent Hispanic or	0=non-Hispanic or non-
	Latina?	Latina, 1=Hispanic or Latina,
		.=missing data
RacialGp	What racial groups do the	0= American Indian/Alaskan

	respondent identify with	Native, 1=Asian, 2=Native Hawaiian or Other Pacific Islander, 3=Black or African American, 4=White, 5=Multiple ethnicities, .=missing data
Age	Age of respondent	Write in, .=missing data
MarStat	Is the respondent married or living with partner?	0=no, 1=yes, .=missing data
Ed	What is the highest level of education the respondent has completed?	0=< hs, 1=hs/GED, 2=Some college/junior or technical school, 3=College, 4=Graduate, .=missing data
Income	What is the yearly household income of the respondent?	$\begin{array}{c} 0 = < 20,000, 1 = 20 - 29,000, \\ 2 = 30 - 39,000, 3 = 40 - 49,000, \\ 4 = 50 - 59,000, 5 = > 60,000, \\ .= missing data \end{array}$

#### **BAYESIAN INFORMATION CRITERIA**

Factors	Deviance	Parameters	BIC
			881
1	8709.75	51	.61
			875
2-neg vs. pos	8652.74	53	.64
			8709
<b>2-</b> C	8602.31	53	.21
			8727
3-A	8614.79	56	.74

#### **OUTPUT FOR DIMENSION 1**

#### SUMMARY OF 104 MEASURED PERSONS

1	RAW			MODEL		INFI	r	OUTFI	[T
ļ	SCORE	COUNT	MEASUR	E ERROR	M	ISQ 2	STD	MNSQ	ZSTD
MEAN	54.8	21.4	.9	.37 <b>.</b> 37	1	.01	2	1.05	.0
S.D.	13.1	2.2	1.2	0.09		. 52	1.6	.81	1.3
MAX.	87.0	25.0	5.0	6 1.03	2	.56	3.6	7.01	3.8
MIN.	30.0	19.0	-1.4	7.28		.25 -	-3.5	.24	-2.7
REAL	RMSE .42	ADJ.SD	1.12 S	EPARATION	2.66	PERSO	REL	LABILITY	. 88
MODEL	RMSE .38	ADJ.SD	1.13 S	EPARATION	2.96	PERSO	I REL	IABILITY	.90
S.E.	OF PERSON ME	CAN = .12							

VALID RESPONSES: 85.6%

PERSON RAW SCORE-TO-MEASURE CORRELATION = .83 (approximate due to missing data) CRONBACH ALPHA (KR-20) PERSON RAW SCORE RELIABILITY = .95 (approximate due to missing data)

SUMMARY OF 25 MEASURED ITEMS

+											
l	RAW					MODEL		INF	ΙT	OUTF	ГT
	SCORE	E	COUNT	MEAS	URE	ERROR	M	INSQ	ZSTD	MNSQ	ZSTD
MEAN	228.1	 L	89.0		.00	.20		.98	1	1.04	.1
S.D.	118.4	1	29.5	1	.20	.07		.18	1.2	.26	1.2
MAX.	378.0	)	104.0	3	.46	.36	1	.24	1.8	1.75	2.2
MIN.	12.0	)	30.0	-1	.91	.14		.54	-3.4	.49	-2.7
REAL	RMSE .	.22	ADJ.SD	1.18	SEP	ARATION	5.29	ITEM	REL	IABILITY	.97
MODEL	RMSE .	.22	ADJ.SD	1.18	SEP	ARATION	5.43	ITEM	REL	IABILITY	.97
S.E.	OF ITEM N	IEAN	= .24								
		DELE	TED:	29 ITE	MS						

UMEAN=.000 USCALE=1.000

ITEM RAW SCORE-TO-MEASURE CORRELATION = -.42 (approximate due to missing data) 2226 DATA POINTS. APPROXIMATE LOG-LIKELIHOOD CHI-SQUARE: 3636.00

#### SUMMARY OF CATEGORY STRUCTURE. Model="R" FOR GROUPING "1" ITEM NUMBERS: 1-12 14-15 17-18 50-54

CATEGO	SCOR	OBSERV E COUN	VED OB	SVD RGE	SAMPLE	INFIT ( MNSQ	OUTFIT  MNSQ	STRUCTURE	CATEGO	RY   RE		
1 2 3 4	1 2 3 4	139 335 679 658	6  15  31  30	75 13 .95 2.27	94 01 .98 2.22	1.24 .86 .94 .93	1.31  .87  .91  .95	NONE   -1.36  23   1.59	( -2.6  8   .7   ( 2.8	5)  1 7   2 8   3 0)  4		
MISSIN	iG	373	17	.79	ĺ		I		I	i		
BSERVE	D AV	ERAGE :	is mea	n of	measur	es in o	categor	y. It is no	ot a pa	ramet	er est	imate
CATEGO	DRY	STRU	CTURE E S.E	 •   4	SCORE- AT CAT.	-TO-MEAS	SURE	50% CUM.  PROBABLTY	COHER	ENCE   C->M	ESTIM  DISCR	
1 2 3 4	]	NONE -1.36 23 1.59	.1 .0 .0	( 0   7   6   (	-2.65) 87 .78 2.80)	-INF -1.85 08 1.91	-1.85 08 1.91 +INF	   -1.59  14   1.73	56%   46%   52%   78%	15%  47%  70%  60%	 .78  1.05  1.13	1 2 3 4
I−>C = :->M =	Does	Measur Catego	re imp ory im	ly C. ply 1	ategory Measure	/? ??	Structu		a at in	toreo	ations	
1.0	++ +   		-+		-+	+		-+	-+	+	+ +   	
.8	1 + 11:     	1 11 11 11	L						44 44	44 44 4	 +   	
.6	+ 		11 11				3333	333	44 4		+ 	
.5 ) . 4	+   +		1	1122	2222222	2 333	333	3333 44 4*3 44 3	22		+   +	
	 	22	22 22		1 3 11 33	3 22	222	4 4 44	33 333		1	
.2	 + 22  22 	222 22	333	333 3	3*1 33 11	11 1***4	22 4 44*2 44 2 44 2	4 222 2222	:	333 33	 +   	
.0	 +***	3333 ***4444	333 144444	4444	444 4444	444 :	111111	2222	22222 11111**	*****	 +	
	-3 PERS		-2 [NUS]	ITEM	-1 MEASUF	0 E		1	2	3	т	

#### ITEM STATISTICS: ENTRY ORDER

1+											
+  ENTRY RAW MODEL  INFIT   OUTFIT   PTBSE EXACT											
MATCI	H ESTIM	1									
INUM EXP%	BER SCORE COUN  DISCR  ITEM	G	S.E.  MNSQ	ZSTDIMNSQ	<b>zstd</b>   C	ORR.  OBS%					
+++++++											
1	1 378 10	04 -1.76	.19  .99	.0 1.10	.51	.36  74.0	71.2				
.941	10 <b>0</b> 01 1   2 274 10	.68	.14 1.20	1.5 1.16	1.2	.54  48.1	49.7				
.791 I	10 <b>0</b> 02 1   3 220 10	03 1.61	.14 1.04	.3 1.08	.71	.49  54.4	50.01				
.801 I	10003 1   4 337 10	0458	.15 1.11	.8 1.17	1.01	.58  56.7	57.1				
.91 	10 <b>0</b> 04 1   5 320 10	0421	.15  .81	-1.4  .76	-1.71	.72  55.8	54.0				
1.31	10005 1   6 366 10	04 -1.35	.18  .54	-3.4  .49	-2.7	.69  81.7	65.61				
1.43	<b>10</b> 006 1   7 364 10	04 -1.29	.17  .78	-1.5  .87	51	.54  73.1	65.1				
1.16	<b>1 10</b> 007 1   <b>8 323 10</b>	0427	.15  .87	-1.0  .80	-1.3	.54  62.5	54.5				
1.20		0402	.14  .76	-1.9  .72	-2.01	.65  62.5	52.7				
1.34		)359	.15  .89	7 1.12	.7	.37  66.0	57.2				
1.00	11 276 10	.60	.14 1.16	1.2 1.18	1.3	.53  47.6	50.21				
./3	12 339 10	0463	.15 1.20	1.4 1.05	.41	.56  56.7	57.4				
1	10012 1 1 14 301 10	.18	.14 1.14	1.1 1.10	.71	.46  49.0	52.1				
	10014 1 1 15 297 10	.25	.14  .94	4  .92	61	.51  54.8	52.0				
	17 317 10	0414	.14  .91	7  .87	8	.58  55.8	53.7				
1		04 1.48	.14 1.24	1.8 1.31	2.2	.48  40.4	49.21				
	46 88 10 10046 0 1	04 -1.19	.29 1.07	.5 1.29	.81	.20  84.6	84.8				
1	47 12 10 10047 0 1	3.46	.34 1.06	.4 1.18	.5	.27  87.5	89.21				
981	48 95 10 10048 0 1	04 -1.91	.36 1.01	.1 1.75	1.3	.24  91.3	91.3				
1	49 29 10 10049 0 1	2.10	.25 1.23	1.7 1.14	.71	.36  68.9	77.5				
1 30	50 96 3	.11	.28  .69	-1.2  .71	91	.49  63.3	54.3				
1 871	51 102 3	3038	.30  .99	.1 1.43	1.2	.33  53.3	60.2				
1	52 104 3	3057	.31  .76	8  .81	4	.48  66.7	62.0				
1	53 99 3 I T0053 1 I	3013	.29 1.10	.5  .98	.1	.50  56.7	56.3				
1 1.00	54 90 3 10054 1 1	30.54	.26 1.07	.4  .99	.1	.62  43.3	52.4				
1				+	+-	+	+				
ME	AN 228.1 89.	.0 .00	.20  .98	1 1.04	.1	62.2	60.81				
s.1	D. 118.4 29. I	.5 1.20	.07  .18	1.2  .26	1.2	13.4	12.3				
+											

#### **OUTPUT FOR DIMENSION 2**

#### SUMMARY OF 104 MEASURED PERSONS

1	RAW			MODEL	IN	 FIT	OUTFIT	
1	SCORE	COUNT	MEASURE	ERROR	MNSQ	ZSTD	MNSQ	ZSTD
MEAN	57.9	19.9	1.00	.38	1.07	1	1.00	2
S.D.	10.7	.6	1.44	.08	.69	1.9	.59	1.8
MAX.	78.0	20.0	4.70	.76	4.02	5.9	3.77	5.7
MIN.	30.0	14.0	-2.43	.33	.26	-3.4	.25	-3.5
REAL	RMSE .45	ADJ.SD	1.37 SEP	ARATION	3.03 PER	SON REL	IABILIT	r.90
MODEL	RMSE .39	ADJ.SD	1.39 SEP	ARATION	3.58 PER	SON REL	IABILIT	Y .93
S.E.	OF PERSON ME	AN = .14						

VALID RESPONSES: 99.6%

PERSON RAW SCORE-TO-MEASURE CORRELATION = .97 (approximate due to missing data) CRONBACH ALPHA (KR-20) PERSON RAW SCORE RELIABILITY = .93 (approximate due to missing data)

SUMMARY OF 20 MEASURED ITEMS

+									
RAW				MODEL		INFIT			IT
1	SCORE	COUNT	MEASURE	ERROR	MN	ISQ	ZSTD	MNSQ	ZSTD
MEAN	301.2	103.6	.00	.16		.99	1	.99	.0
S.D.	34.8	.6	.85	.01		.23	1.6	.27	1.7
MAX.	352.0	104.0	1.74	.18	1.	57	3.8	1.77	4.9
MIN.	228.0	102.0	-1.32	.15		60	-3.2	.58	-2.7
REAL	RMSE .17	ADJ.SD	.84 SE	PARATION	5.03	ITEM	REL	IABILITY	.96
MODEL	RMSE .16	ADJ.SD	.84 SE	PARATION	5.21	ITEM	REL	IABILITY	.96
S.E.	OF ITEM MEAN	= .20							
r	DEL	ETED:	34 ITEMS						

UMEAN=.000 USCALE=1.000

ITEM RAW SCORE-TO-MEASURE CORRELATION = -1.00 (approximate due to missing data) 2071 DATA POINTS. APPROXIMATE LOG-LIKELIHOOD CHI-SQUARE: 3683.55

## SUMMARY OF CATEGORY STRUCTURE. Model="R"

CATEGO   LABEL	RY OBS	SERVED  DUNT %	OBSVD AVRGE	SAMPLE   EXPECT	INFIT ( MNSQ	DUTFIT  MNSQ	STRUCTURE   CALIBRATN	CATEGOR   MEASUR	 Y   E		
   1   2   3   4	1 14 2 47 3 86 4 57	14 7   72 23   35 43   70 27	90 33 .93 2.69	<b>)</b> -1.29  <b>3</b> 20  <b>3</b> .99  <b>9</b> 2.59	1.45 .88 .92 .90	1.62  .87  .81  .92	NONE   -1.93  25   2.18	+   ( -3.15   -1.12   1.01   ( 3.34	-+ )  1   2   3 )  4		
MISSIN	G	9 01	.63	3 I		i	I	I	i		
OBSERVE	D AVERAG	GE is n	nean of	f measur	es in c	categor	y. It is no	ot a par	amet	er est	imate
+  CATEGO   LABEL	RY ST MEAS	RUCTUR	RE   5.E.	SCORE- AT CAT.	TO-MEAS	SURE	50% CUM.  PROBABLTY	COHERE   M->C C	NCE   ->M	ESTIM  DISCR	
1   2   3   4	NONE -1.  2.	E .93 .25 .18	.10   .06   .06	( -3.15) -1.12 1.01 ( 3.34)	-INF -2.27 12 2.38	-2.27 12 2.38 +INF	   -2.08  18   2.26	57%   52%   59%   79%	13%  54%  76%  58%	 .69  1.01  1.16	1 2 3 4
+ M->C = C->M =	Does Mea Does Cat	isure i cegory	mply ( imply	Category Measure	? ?						
P R 1 0	CATEGOF ++ +	RY PROB	BABILI1	TIES: MC	DES - S	Structu:	re measure:	s at int ++	erse + +	ctions	
с. 110 С	  1								 		
A. B 8	111   111							44 44	 +		
и Г Г Г	1   1	1					А	44 44			
г.6	+	1			33	3333333	3 44		+		
r .5	 +	1	11 222	222	33		33 4 334		 +		
D E .4	 +	2	2* 2 1	2 3	*3 22		443 4 33		 +		
R R	     ?	22 22 22	1	3 13 3	22 2	4. 22 4	4 33 4 :	3 33	   		
5.2 P	+ 22   222	. 6	33	3311 3 11	2	2*4 44 22		333 33	+		
C N	2 	3333	333 3	1 4	1 444 4***11	22	22 22222				
5.0	' +*******	**4444	444444	444444	1	.1111111	1111111***	******	+		
<b>-</b>	-4 - PERSON	-3 [MINUS	-2 ] ITEM	-1 1 MEASUR	0 E	1	2 3	3 4	Ŧ		
### ITEM STATISTICS: ENTRY ORDER

EN]	ſRY	RAW			MODEL   IN	IFIT   OUT	FIT   P'	<b>FBSE   EXACT</b>	
MATO	CHIES	STIM		MENCUDE					
TYPE	185K	SCORE SCRI ITTE	M	MEASURE	S.E. MNSQ	ZSTUIMNSQ	ZSTDICC	JRR.   UBS&	
					+	+	+-	+	+
-+		1							
1	24	339	103	-1.01	.17  .81	-1.3  .73	-1.61	.68  73.8	63.4
1.21	25	312	103	26	.161.78	-1.61.74	-1.81	.721 67.0	59.01
1.27	1 1	025							
1	26	309	103	19	.16 1.13	.9 1.20	1.3	.57  63.1	58.3
.881	100	26	102		161 05	_1 11 02	-1 21	771 69 0	50 21
1.20	1 1	027 1	105	09	.101 .05	-1.11 .05	-1.21	./31 00.0	50.21
1	29	293	102	.12	.16  .99	.0  .98	1	.65  55.9	56.8
1.05	I I	029							50 61
121	<b>30</b>	<b>235</b>	103	1.54	.1511.57	3.811.77	4.9	.35  53.4	53.61
	31	228	104	1.74	.15  .98	1 1.00	.01	.60  55.8	53.1
.98	10	31							
1	32		104	78	.17  .90	7  .89	6	.58  70.2	62.1
1.14	33	267	103	.83	.15 1.05	.411.06	.51	.61  55.3	55.51
.951	10	33							·
	34	275	104	.69	.15  .97	2  .97	21	.56  57.7	55.5
1.03	1 I 35	259	104	1.05	.1511.07	.511.08	. 61	.581 58.7	55.31
.901	10	35 1	101	1.00					00101
	36	321	104	42	.16  .96	2 1.02	.21	.59  64.4	60.01
1.03	I(	036   343	104	-1 04	171 60	-3 21 58	-2 71	701 79 8	63 51
1.43	I I	037	104	1.04	.177 .00	5.21 .50	<b>-</b> ···		03.31
1	38	352	104	-1.32	.18  .77	-1.7  .73	-1.4	.59  71.2	65.1
1.23		038	104	<b>C A</b>	171 01	61 00	71		61 21
1.12	39   T	039 I	104	04	.17 .91	0  .88	/1	.02  01.3	01.31
1	40	330	104	67	.17  .93	4  .87	8	.62  62.5	61.7
1.07	1	040			15.1.00		<u>.</u>		56.04
991	41 TO	297	104	.18	.1511.06	.4 1.02	.21	.60  56./	56.81
	43	293	104	.27	.15 1.20	1.5 1.20	1.4	.53  56.7	56.21
.78	10	43							
201	<b>44</b>	272	104	.76	.15 1.51	3.411.53	3.5	.55  41.3	55.4
1	45	330	103	75	.17  .83	-1.21 .84	91	.61  67.0	62.01
1.18	4 1	045			•	•	•	•	•
					+	+	+	+	+
-+	EAN	301.2	103.6	.00	.16  .99	1  .99	.01	62.0	58.6
I.		l.							
S.	D.	34.8	.6	.85	.01  .23	1.6  .27	1.7	8.4	3.51
+									
	+								

**APPENDIX C** 

#### **FINAL VERSION OF THE EPBS-Q**

For each of the following statements, breastfeeding includes breastfeeding a baby and/or using a breast pump. Please think about each statement as it most applies to you, whether you are pregnant and thought about breastfeeding or if you are currently breastfeeding and/or pumping breast milk.

#### This section asks about the overall support you feel would be provided by your company if you wanted to continue breastfeeding or pumping breast milk after returning to work.

		Strongly agree ▼	Agree	Disagree	Strongly disagree
1.	I would have enough maternity leave (paid and/or unpaid time off) to get breastfeeding started before going back to work.	•		•	
2.	I would be able to get information about combining work and breastfeeding from my company.				
3.	I'm certain my company has written policies for employees that are breastfeeding or pumping breast milk.				
4.	I'm certain there is a place I could go to breastfeed or pump breast milk at work.				
5.	There is someone I could go to at work that would help me make arrangements for breastfeeding or pumping breast milk.				
6.	My job could be at risk (e.g. lose my job or get fewer scheduled hours) if I breastfed or pumped breast milk at work.				
7.	I would be able to talk about breastfeeding at work.				

		Strongly agree	Agree	Disagree	Strongly disagree			
8.	I would feel comfortable asking for accommodations to help me breastfeed or pump breast milk at work.							
9.	My opportunities for job advancement would be limited if I breastfed or pumped breast milk at work.							
10.	I'm certain that women in higher-level positions have breastfed or pumped breast milk at my workplace.							
11.	I'm certain co-workers have breastfed or pumped breast milk at my workplace. <b>This section asks abo</b>	□ ut the pace	D of your jot	□ and availal	D ble time			
	during your workday to breastfeed or pump breast milk.							
12.	My breaks are <u>frequent</u> <u>enough</u> for breastfeeding or pumping breast milk.							
13.	My breaks are <u>long</u> <u>enough</u> for breastfeeding or pumping breast milk.							
14.	I could adjust my break schedule in order to breastfeed or pump breast milk.							

# This section asks about the overall support you feel would be provided by your direct manager/supervisor if you wanted to continue breastfeeding or pumping breast milk after returning to

		Strongly agree	Agree	Disagree	Strongly disagree
15.	My manager would support me breastfeeding or pumping breast milk at work.				
16.	My manager would help me combine breastfeeding and work.				
17.	My manager would think I couldn't get all my work done if I needed to take breaks for breastfeeding or pumping breast milk.				
18.	I would feel comfortable speaking with my manager about breastfeeding.				
1 <b>9</b> .	My manager says things that make me think he/she supports breastfeeding.				
20.	My manager would consider breastfeeding at work a personal choice, not something he/she should have to deal with.				
21.	My manager would consider it part of his/her job to help me combine				

breastfeeding and work.

	breastieeding and work.				
22.	My manager would think less of workers who choose to breastfeed or pump breast milk at work.	ו			
		Strongly agree	Agree	Disagree	Strongly disagree ▼
23.	My manager would make sure my job is covered if I needed time for breastfeeding or pumping breast milk.				
24.	My manager would change my work schedule to allow me time for breastfeeding or pumping breast milk.				
25.	My manager would help me deal with my workload so I could breastfeed or pump breast milk at work.				
26.	My manager would be embarrassed if I spoke with him/her about breastfeeding.				
	This section asks about th provided by your co-workers i or pumping breast	e overall s if you wan milk after	upport yo ted to cor returning	ou feel wou ntinue brea g to work.	ld be astfeeding
27.	My co-workers would think less of workers that choose to breastfeed or pump breast milk at				

	work.		
28.	I would feel comfortable speaking with my co-workers		
	about breastfeeding.		

29. My co-workers say things that

	make me think they support breastfeeding.					
30.	My co-workers would chang their break times with me so I could breastfeed or pump b milk.	ge that preast				
		Strongly agree	Agree	T	Disagree	Strongly disagree
31.	My co-workers would cover my job duties if I needed time for breastfeeding or pumping breast milk.			·		
32.	My co-workers would be embarrassed if I spoke with them about breastfeeding.					

# NOTE: PLEASE ANSWER QUESTIONS 33 - 36 as YES or NO

		Yes	No
33.	I could buy or borrow th equipment I would need for pumping breast milk	ie . 🗆	
34.	My company would supply the equipment I would need for pumping breast milk at work.	g 🗆	
35.	I could find a place to store expressed breast milk at work.		
36.	There is a company- designated place for women to breastfeed or pump milk during the workday.	☐ ↓ If yes, please ca number 37 on t	□ ontinue to he next
		page.	

## If you answered YES to QUESTION 36, please answer the following questions.

### If you answered NO to question 36, please SKIP this set of questions and go to question 42.

### This section asks about the physical environment of your workplace for breastfeeding or pumping breast milk after returning to work.

		Strongly agree ▼	Agree ▼	Disagree ▼	Strongly disagree ▼
37.	The designated place for breastfeeding or pumping breast milk at work would be available when I needed it.				
38.	The designated place for breastfeeding or pumping breast milk is close enough to my work area to use during my breaks.				
39.	I would feel comfortable breastfeeding or pumping breast milk in the designated place.				
40.	The designated place for breastfeeding or pumping breast milk is satisfactory.				
41.	The designated place for breastfeeding or pumping breast milk includes everything I need.				

Please answer the following questions by filling in the box next to your answer.

42) Have you ever breastfed a child?

No (Skip to question 45)
Yes

43) How many children have you breastfed?

- 1 child
  2 or more children
- 44) What is the longest you have ever breastfed a child?
  - $\Box \qquad \text{Less than 1-week}$
  - $\Box$  1 6 weeks
  - $\Box$  More than 6 weeks 3 months
  - □ More than 3 months 6 months
  - $\Box$  More than 6 months

45) How long have you worked for your current employer?

- $\Box \qquad \text{Less than 6 months}$
- □ 6-12 months
- $\Box$  13 months 5 years
- $\Box$  More than 5 years
- 46) How many hours do you usually work each week?
  - □ Less than 20 hours/week
  - $\Box$  20 30 hours/week
  - $\Box$  31 40 hours/week
  - □ More than 40 hours/week
- 47) Are you paid hourly or salary?
  - □ Hourly
  - □ Salary

48) Are you a member of a labor union?

- □ Yes
- □ No

49) Is your immediate manager male or female?

- □ Female

50) What is the gender of the majority of your co-workers?

- □ Mostly male
- About an equal number of male and female
- □ Mostly female

51) How many weeks of leave did you take before returning to work after your last child?

- $\Box \qquad \text{Less than 6 weeks}$
- $\Box$  6 12 weeks
- $\Box \qquad \text{More than 12 weeks}$

52) Was any of the leave *paid*? (Includes leave that was paid at any percentage, e.g. 50%, 80%, and/or any paid sick, personal, or vacation time)

No (Skip to question 54)
Yes

53) How many weeks of *paid* leave did you take after your last child?

- $\Box$  1 3 weeks
- $\Box$  4 6 weeks
- $\Box$  7 9 weeks
- $\Box$  10 12 weeks
- $\Box \qquad \text{More than 12 weeks}$

-

54) What is your job title?

- 55) Which of the following are you...? Select one.
  - ☐ Hispanic or Latino
  - □ Non-Hispanic or non-Latino
- 56) What race do you consider yourself to be? Choose as many as apply.
  - American Indian/ Alaskan Native
  - □ Asian
  - □ Native Hawaiian or Other Pacific Islander
  - **Black or African American**
  - □ White
  - □ Other

57) What is your age in years? \_\_\_\_\_\_ years old.

58) Are you currently married or living with a partner?

□ Yes □ No

59) What is the highest level of education you have completed?

- Less than high school
- □ High School/GED
- Some college/Junior college or technical school degree
- □ College degree
- □ Graduate degree

60) What is your yearly household income?

- □ Less than \$20,000/year
- □ \$20,000 \$30,000/year
- □ \$31,000 \$40,000/year
- □ \$41,000 \$50,000/year
- S51,000 \$60,000/year
- $\Box$  More than \$60,000/year

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