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Message Framing and Protection Motivation Theory as Predictors of Breastfeeding Intentions

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THE FLORIDA STATE UNIVERSITY

SCHOOL OF COMMUNICATION

MESSAGE FRAMING AND PROTECTION MOTIVATION THEORY

AS PREDICTORS OF BREASTFEEDING INTENTIONS

By

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TABLE OF CONTENTS

List of Tables	vi
List of Figures	vii
Abstract	viii
1. INTRODUCTION	1
General Considerations	1
Problem Statement	2
Purpose and Objective	3
Organization	4
2. LITERATURE REVIEW	5
Infant and Child Health Outcomes Associated with Not Breastfeeding	5
Infections	5
Chronic Diseases	6
Childhood Autoimmune Disease – Asthma	7
Infant Mortality	7
Maternal Health Outcomes Associated with Not Breastfeeding	7
Breast Cancer	8
Ovarian Cancer	8
Cardiovascular Disease and Diabetes	9
Stress and Maternal & Infant Bonding	9
Breastfeeding Rates in the United States	10
Health Behavior Theories and Behavioral Intentions	11
Breastfeeding Intentions	12
Protection Motivation Theory	15
Perceived Vulnerability	18
Perceived Severity	19
Intrinsic and Extrinsic Rewards	19
Self-efficacy	19
Response Efficacy	21
Response Costs	21
Negative Affect	21
Message Framing	23
Moderators of Framing	26
Perceived Risk and Message Framing	27
Negative Affect and Message Framing	28
Affect, Information Acceptance, and Message Framing	28
Response Efficacy and Message Framing	29
Self-efficacy and Message Framing	30
Information Acceptance, Self-efficacy, and Message Framing	31
Summary and Conclusions	32
Theoretical Framework	33

Research Design and Hypotheses	34
3. METHODOLOGY	39
Design	39
Data Collection Procedures.....	43
Sample and Sampling Issues.....	43
Measures	44
Statistical Procedures	48
4. RESULTS	50
Descriptive Analysis	50
Test of Hypotheses.....	54
Summary of Findings.....	64
5. DISCUSSION.....	66
Message Framing.....	67
Threat Appraisals.....	68
Coping Appraisals.....	68
Negative Affect.....	69
Information Acceptance.....	69
Limitations	70
Future Research and Implications.....	71
APPENDICES	74
Appendix A- Survey Questionnaire.....	74
Appendix B- IRB Letter of Approval	83
Appendix C- Approved Informed Consent Form	84
Appendix D- Survey Recruitment Letter.....	85
REFERENCES	86
Biographical Sketch.....	101

LIST OF TABLES

Table 1. Summed Unstandardized Indices and Cronbach's Alpha Reliabilities.....	48
Table 2. Sample Respondents' Demographic Characteristics and Breastfeeding Experience	50
Table 3. Sample Respondent's Behavioral Intentions	53
Table 4. Multiple Regression Analyses, Using Loss-Framed Messages and Gain-Framed Messages to Predict Threat Appraisals of Outcomes Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences).	55
Table 5. Multiple Regression Analyses, Using Loss-Framed Messages and Gain-Framed Messages to Predict Coping Appraisals of Outcomes Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences).	57
Table 6. Multiple Regression Analyses, Using Loss-Framed Messages, Gain-Framed Messages, Threat Appraisals and Coping Appraisal to Predict Negative Affect Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences).	59
Table 7. Multiple Regression Analyses, Using Coping Appraisals and Negative Affect to Predict Information Acceptance Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences).	61
Table 8. Correlations of Variables in Analyses.	62
Table 9. Multiple Regression Analyses, Using Threat Appraisals and Coping Appraisals to Predict Breastfeeding Intentions (Controlling for Race and Breastfeeding Experiences).	63
Table 10. Multiple Regression Analyses, Using Information Acceptance to Predict Breastfeeding Intentions (Controlling for Race and Breastfeeding Experiences).	64

LIST OF FIGURES

Figure 1. A baseline model of Protection Motivation Theory (Rogers, 1975).	34
Figure 2. The proposed message-frame PMT model, controlling for race and breastfeeding experience.	38

ABSTRACT

While the maternal and infant health benefits of breastfeeding are greatly supported by research, breastfeeding rates in the United States remain sub-optimal. Increasing the prevalence of infant breastfeeding is an important public health goal as the maintenance of maternal and infant health is one of society's best investments. Applying the Protection Motivation Theory, this study seeks to identify conditions that maximize the desired impact of health information on intentions to partake in breastfeeding.

Research has shown that the way a message is framed can differentially affect an individual's judgments, decisions, and behaviors. This study investigates whether gain- and loss-framed messages vary in their impact on behavioral intentions to breastfeed among female college students. Utilizing a survey with a field-experimental manipulation, this study examines the effects of message framing on intentions to breastfeed, considering threat appraisal variables, coping appraisal variables, as well as negative affect and information acceptance as moderating variables. The survey contains measures of vulnerability, severity, maladaptive rewards, self-efficacy, response efficacy and cost, negative affect, and information acceptance.

Multiple regression analyses were employed to test the relationships identified by ten hypotheses. The findings of this study show loss-framed messages are significantly positively related to threat appraisals, as suggested in the literature. However, this study was unable to produce support for the use of gain-framed messages in predicting breastfeeding intentions.

This study proposed the addition of negative affect and information acceptance to the traditional PMT model. Threat appraisals were found to be significantly positively related to negative affect, and coping appraisals were found to be significantly positively related to information acceptance. Both threat and coping appraisals were found to significantly positively predict breastfeeding intentions. When controlling for race and breastfeeding experience, some findings varied, indicating a need for breastfeeding interventions tailored to women's race and level of experience. These findings should be taken into consideration by health professionals attempting to develop materials that are meant to increase breastfeeding intentions.

CHAPTER 1

INTRODUCTION

General Considerations

A growing body of research continues to demonstrate that even in developed countries, there are numerous health advantages to be enjoyed from breastfeeding. Research has shown the nutritional, developmental, immunologic, social, economic, and environmental benefits of breastfeeding (American Academy of Pediatrics, 2005). Currently, in the United States chronic diseases are the leading causes of death and disability (CDC, 2010); the high levels of heart disease, cancer, obesity, and diabetes are all health risks that breastfeeding can help protect against.

Breastfed infants experience nutritional and growth benefits (Dennis, 2002) and develop an enhanced immune system (Garofalo & Goldman, 1999) and resistance to diseases (Dewey et al., 1995; Howie et al., 1990). The concept of “programming” suggests that factors in the early months of life may influence lifelong health (Horta, Bahl, Martines, & Victora, 2007), and links poor nutrition in the early post-natal period to considerable disease burden, including obesity (Stuebe, 2009), allergies (Chandra, 2002), diabetes (Young et al, 2002; Ip et al, 2007), asthma (Ip et al, 2007; Gdalevich, Mimouni, & Mimouni, 2001), cancer (Ip et al., 2007; Kwan, Buffler, Abrams, & Kiley, 2004), celiac disease (Davis, 2001), and cardiovascular conditions (Singhal & Lucas, 2004).

Similarly, a number of studies have found that there are numerous maternal health benefits associated with breastfeeding, such as lower risk of Type 2 diabetes (Ip et al, 2007; CDC, 2010). Prior research suggests that breastfeeding protects against osteoporosis (Cumming & Klineberg, 1993), lowers the risk of breast cancer (Ip et al, 2007) and ovarian cancer (Whittemore et al., 1992). Psychological benefits for breastfeeding mothers include increased self-confidence and facilitated bonding with the newborn (Kuzela, Stifter, & Worobey, 1990). In addition, breastfeeding is associated with reduced perceived stress and negative mood in mothers (Mezzacappa & Katkin, 2002).

The literature indicates that a number of factors may influence a woman's decision to breastfeed or how long to breastfeed; these include fewer children, past breastfeeding experience, breastfeeding knowledge, self-efficacy, and perceived social support (Mitra, Khoury, Hinton, & Carothers, 2004). Additionally, previous studies report that women are more likely to breastfeed if they have a positive attitude toward breastfeeding (Black, Blair, Jones, & Durant, 1990; Freed, Jones, & Schanler, 1992; Wambach, 1997; Tarkka, Paunonen, & Laippala, 1999; Mahoney & James, 2000).

Problem Statement

Not breastfeeding is associated with multiple risks for both the infant and mother. For infants, not being breastfed is associated with an increased incidence of infectious morbidity, as well as elevated risks of childhood obesity, Type 1 and Type 2 diabetes, leukemia, and Sudden Infant Death Syndrome (Stuebe, 2009). Research suggests that women who do not breastfeed face higher risk of breast cancer and ovarian cancer, as well as obesity, Type 2 diabetes, metabolic syndrome, and cardiovascular disease (Stuebe, 2009). However, in a survey of a sample of new mothers, an infant's diet was perceived to be a less important influence on lifelong health than many lifestyle, behavioral and environmental factors, and genetics (Gage et al, 2012).

In spite of recommendations from the American College of Obstetricians and Gynecologists, the American Academy of Pediatrics, the American Academy of Family Physicians, and the World Health Organization, while 74.2% of U.S. infants were breastfed at least once after delivery, only 31.5% were exclusively breastfed at age 3 months, and just 11.9% were exclusively breastfed at age 6 months (CDC, 2011).

Health communication professionals attempting to predict when people will take precautions against illness or injury often turn to the Protection Motivation Theory which considers both threat (i.e. risk perceptions) and coping appraisals (i.e. self-efficacy) as motivators for adopting health-related behaviors (Norman, Boer, & Seydel, 2005). Previous studies have shown a positive relationship between risk perceptions and self-efficacy and individuals' attitudes, beliefs and intentions toward adopting precautionary behaviors (Weinstein, 1989; Chapin, 2001). In addition to risk perceptions and self-efficacy, research suggests that negative affect (e.g. worry, fear) may also play a central role in predicting health behaviors (Mullens,

McCaul, Erickson & Sandgren, 2004; Hay, Buckley & Ostroff, 2005; McQueen, Vernon, Meissner & Rakowski, 2008).

Additional considerations in identifying strategies to maximize the impact of health promotion messages have included a focus on gain- and loss-framed messages (Rothman & Salovey, 1997; Apanovitch, McCarthy, & Salovey, 2003; Mann, Sherman, & Updegraff, 2004). Research has shown that the way a message is framed can have differing effects on individuals' judgments, decisions, and behaviors (Rothman & Salovey, 1997). However, there are inconsistent findings regarding when gain- and loss-framed messages are most effective.

Recent research suggests that individuals' perceptions of the level of risk of particular behaviors interact with the message frame to predict health behaviors (Apanovitch, McCarthy, & Salovey, 2003). Self-efficacy has also been proposed as a possible moderator of gain- and loss-framed messages on health intentions and health behavior (Van 't Riet, Ruiter, Werrij, & De Vries, 2008, 2010). Additionally, recent studies have suggested that information acceptance and negative affect may play important roles in the way framing of messages impacts health behavioral intentions (Van't, Ruiter, Werrij, & De Vries, 2010). To increase the effectiveness of the communication of health information, investigators should explore how people process, interpret and respond to different messages, and how personal characteristics and perceptions of risk affect comprehension and behavior change (Gage et al, 2012).

Purpose and Objective

With that in mind, this study will examine messages framed as gains and losses. This study seeks to identify conditions that maximize the desired impact of health risk information on intentions to partake in breastfeeding and to better understand how people's behavioral intentions are related to risk perceptions, coping appraisals, information acceptance, and negative affect, with a specific focus on risks associated with not breastfeeding.

This study investigates the extent to which Protection Motivation Theory explains variation in the behavioral intentions to breastfeed among female college students. While the decision to breastfeed may not be an immediate concern for most students, it is in the not too distant future. In 2006, the average age of first-time mothers was 25 years of age (Mathews & Hamilton, 2009). Increasing the prevalence of infant breastfeeding is an important public health goal as the maintenance of maternal and infant health is one of society's best investments.

Identifying the best way to communicate the risks associated with not breastfeeding will further increase the chances of motivating new mothers to breastfeed. The objective of this study is to investigate whether these messages differentially impact behavioral intentions to breastfeed when applying Protection Motivation Theory, with the addition of measures of information acceptance and negative affect.

Organization

The following sections describe the content of this dissertation. Chapter Two reviews the literature related to the risks associated with not breastfeeding as well as the current breastfeeding rates. This chapter also presents the theoretical approach and current literature on message framing. This section concludes with the proposed model and hypotheses.

Chapter Three outlines the research methods in this study. The sample, female college students, is introduced, along with a description of the survey and data collection procedures. This section ends with a discussion of the data analysis techniques used.

Chapter Four presents the study results. This section focuses on answering the hypotheses detailed in Chapter Two. Chapter Five, the final chapter, discusses the findings of the study. The implications and limitations of the study are also described. This section concludes with recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

The wide range of benefits breastfeeding provides to mother and child have been well documented (McVea, Turner, & Pepler, 2000; Möller, Olsson, & Ranstam, 2002; Young et al., 2002; Bachrach, Schwarz, & Bachrach, 2003; Kramer et al, 2003; Chantry, Howard, & Auinger, 2006; Danforth et al., 2007; Ip et al., 2007; Stuebe, 2009; CDC, 2010). The health benefits associated with breastfeeding are evidenced throughout the life-course. Furthermore, the economic impact of breastfeeding is considerable with significant cost savings associated with duration of exclusive breastfeeding (Bartrick & Reinhold, 2010). A recent study, by Bartrick and Reinhold (2010) states that failing to improve breastfeeding rates, duration, and exclusivity translates into billions of dollars in excess costs for the United States and hundreds of preventable infant deaths.

Infant and Child Health Outcomes Associated with Not Breastfeeding

Several studies demonstrate the significant differences between the health of infants fed human milk and infants fed with substitutes for human milk. Breastfeeding's protective effects are wide-ranging and long-term. For infants, not being breastfed is associated with an increased incidence of infectious morbidity, as well as elevated risks of childhood obesity, Type 1 and Type 2 diabetes, leukemia, and Sudden Infant Death Syndrome (SIDS) (Stuebe, 2009).

Infections

Various studies suggest that formula-fed infants face an increased risk of gastroenteritis and diarrhea. Howie et al (1990) found that babies who were breastfed for thirteen weeks or longer had lower rates of gastrointestinal illness throughout the first year of life than infants that were not breastfed. Data from the Promotion of Breastfeeding Intervention Trial (PROBIT) study, a randomized and controlled trial of an intervention to increase the duration of breastfeeding, found that exclusive breastfeeding for 6 months is associated with lower incidence of gastrointestinal infection (Kramer et al., 2003).

In regards to otitis media (middle ear infection), Dewey and colleagues (1995) found 80 percent fewer episodes of prolonged otitis media were reported for breastfed infants than

formula-fed infants and this protection extended all the way into the second year of life. Uhari, Mantysaari, and Niemela (1996) found that breastfeeding for at least 3 months reduced the risk of acute otitis media (RR=0.87; 95% CI: 0.79-0.95). When children who were breastfed for 6 months or more were compared to those who were breastfed for less than 6 months, a statistically significant reduced risk of recurrent acute otitis media was found (RR=0.69; 95% CI: 0.49-0.97) (Uhari, Mantysaari, & Niemela, 1996).

In a meta-analysis, Bachrach, Schwartz, and Bachrach (2003) found exclusively breastfeeding an infant for 4 or more months reduced the risk of respiratory hospitalization in infancy to one-third the risk observed for infants that were not breastfed (RR=0.28; 95% CI: 0.14-0.54). This was independent of other factors that are known to be associated with rates of respiratory illness, including age, smoke exposure, day care, race/ ethnicity, family size, education, and socioeconomic status (Bachrach, Schwartz, & Bachrach 2003).

Chronic Diseases

Breastfeeding has been associated with lower rates of celiac disease, childhood cancer, multiple sclerosis, severe liver disease, and acute appendicitis (Davis, 2001). Several studies suggest that children who are breastfed are less likely to become obese (Ip et al, 2007; Horta, Bahl, Martines, & Victora, 2007; Harder, Bergmann, Kallischnigg, & Plageman, 2005) or develop Type 2 diabetes (Young et al, 2002; Ip et al, 2007; Horta, Bahl, Martines, & Victora, 2007; Owen et al, 2006). Prior research has found that babies breastfed ≤ 2 months are almost 4 times more likely than babies breastfed for more than a year to be obese when they enter elementary school (Stuebe, 2009).

Several studies have examined associations between formula-feeding and childhood leukemia. Two meta-analyses (Ip et al., 2007; Kwan, Buffler, Abrams, & Kiley, 2004) found infants breastfed for ≤ 6 months are almost 3 times more likely to contract a lymphoid malignancy than babies breastfed longer than 6 months. Kwan et al. (2004) found a significant, negative association was observed between long-term breastfeeding (>6 months) and odds of both acute lymphoblastic leukemia (ALL) (odds ratio [OR]=0.76; 95% confidence interval [CI] 0.68, 0.84) and acute myeloblastic leukemic (AML) (OR=0.85; 95% CI 0.73, 0.98). Short-term breastfeeding (≤ 6 months) was similarly protective for ALL (OR=0.88; 95% CI 0.80, 0.96).

Childhood Autoimmune Disease – Asthma

Multiple studies have examined the association between infant feeding and development of asthma. Gdalevich, Mimouni, and Mimouni (2001) conducted a meta-analysis comparing less than 3 months of exclusive breastfeeding with ≥ 3 months of exclusive breastfeeding and found a summary odds ratio of 0.70 (95% CI 0.60 - 0.81), suggesting an association of breastfeeding and a reduction in the development of asthma. Building on this meta-analysis, Ip et al (2007) conducted a meta-analysis stratified by family history of asthma. The authors confirmed the association between breastfeeding and a reduction in the odds of asthma in those subjects without a family history of asthma (OR 0.73, 95%CI 0.59 – 0.92), compared with no breastfeeding. This association was also found for subjects with a positive family history of asthma (OR=0.60; 95%CI 0.43 - 0.82).

Infant Mortality

Chen and Rogan (2004) evaluated the association between infant feeding and mortality in the first year of life. Adjusting for maternal age, education and smoking status, as well as infant race, gender, birth weight, congenital malformation, birth order, parity, and women, infants and children (WIC) status, formula-feeding was associated with an increased odds of infant mortality compared with ever breastfeeding (OR=0.79, 95%CI 0.67 - 0.93).

In recent years, studies have found evidence that breastfeeding lowers the risk of an infant dying from SIDS. In a meta-analysis of 23 observational studies, McVea, Turner, and Pepler (2000) found greater odds of SIDS for formula-feed infants compared to breastfeed infants (OR=2.11, 95% CI 1.66-2.68). This association between breastfeeding and a decreased odds of SIDS (OR=0.64, 95%CI 0.51 - 0.81) was confirmed by recent meta-analyses (Ip et al., 2007; Hauck et al., 2011).

Maternal Health Outcomes Associated with Not Breastfeeding

For mothers, breastfeeding is linked to lower risk of Type 2 diabetes, obesity, breast cancer and ovarian cancer (Ip et al., 2007; CDC, 2010). Additionally, research shows that breastfeeding improves a mother's responsiveness to her baby (Kuzela, Stifter, & Worobey, 1990; Lavelli & Poli, 1998; Kim et al., 2011), her mood, and stress levels (Viriden, 1988; Heck & de Castro, 1993; Mezzacappa et al., 2000; Mezzacappa and Katkin, 2002).

Breast Cancer

A number of studies have examined the relationship between breastfeeding and breast cancer risk. A recent meta-analysis of 47 studies found that each year of breastfeeding was associated with a 4.3% reduction in risk (95% CI 2.9–5.8) of invasive breast cancer (Moller et al, 2002). The reduction in breast cancer risk with breastfeeding remained unaltered after stratification for potential confounders such as parity, number of children breastfed, menopausal status, and lifetime duration of breastfeeding. The results were also adjusted for ethnicity, education, family history of breast cancer, age at menarche, height, weight, BMI, and use of hormonal contraceptives, alcohol, and tobacco. The researchers suggest that the higher incidence of breast cancer in developed countries, such as the United States, may in part be due to the lack of breastfeeding or the short duration of breastfeeding.

A 1994 study of breast cancer rates reported that women who were breastfed themselves had significantly less risk of developing breast cancer (Freudenheim et al, 1994). Both premenopausal and postmenopausal breast cancer were decreased by 26 to 31 percent in women who had been breastfed.

Ovarian Cancer

Similarly, multiple studies have found a higher risk of ovarian cancer among women with children who have never breastfed. In a meta-analysis, breastfeeding for at least 12 months (cumulative duration) was associated with 28% lower odds for ovarian cancer compared to parous women who had never breastfed (OR=0.72, 95%CI 0.54 – 0.97) (Ip et al., 2007). Danforth et al. (2007) found a decrease in ovarian cancer risk for parous women breastfeeding for 18 months or longer compared to women who had never breastfed (RR = 0.66, 95% CI 0.46–0.96).

Cardiovascular Disease and Diabetes

Breastfeeding requires a substantial metabolic expenditure and is associated with more favorable glucose levels, lipid metabolism and blood pressure (Stuebe & Rich-Edwards, 2009). Epidemiological studies suggest that these differences may persist after weaning, with long-term benefits for mothers (Stuebe & Rich-Edwards, 2009). Dewey, Heinig, and Nommsen (1993) compared weight loss during the first year postpartum between women who had breastfed for <3 months and those who had breastfed for ≥ 1 year. Women in the prolonged breastfeeding group lost 4.4 lbs. more than women who weaned at 3 months. This difference in weight persisted for

2 years postpartum.

Several authors have found a higher risk of diabetes among parous women who have never breastfed, compared with those who breastfed for a prolonged period. In the Nurses' Health Studies, the authors found that duration of lactation was inversely associated with risk of Type 2 diabetes in women, independent of other diabetes risk factors, including body mass index, diet, exercise, and smoking status (Stuebe, 2005). Using data from the Women's Health Initiative, Schwarz et al. (2009) found a significant relationship when examining the duration of lactation and the odds of Type 2 diabetes. After adjusting for socio-demographic, family history, lifestyle variables and body mass index, they found that the odds ratio of developing diabetes for women who had breastfed for 1–6 months was 0.91(CI 0.84–0.99); for women who had a lifetime history of breastfeeding for 13–23 months, they found an odds ratio for developing diabetes of 0.75(CI 0.66–0.85) (Schwarz et al, 2009).

Stress and Maternal & Infant Bonding

In a study examining the effects of breastfeeding on maternal stress and mood, Mezzacappa and Katkin (2002) found that breastfeeding mothers reported significantly less stress than bottle-feeding mothers, controlling for maternal age, time postpartum, number of children, and work status. The authors also found evidence that breastfeeding is associated with greater decreases in negative mood than bottle-feeding and that bottle-feeding is associated with greater decreases in positive mood than breastfeeding. These findings support the previous findings that breastfeeding women report less perceived stress and less negative mood than bottle-feeding women (Heck & de Castro, 1993; Mezzacappa et al., 2000; Virden, 1988).

Additionally, studies show that breastfeeding may improve mother–infant attachment (Kuzela, Stifter, & Worobey, 1990; Lavelli & Poli, 1998; Kim et al, 2011). Kim and colleagues (2011) found links between breastfeeding and greater response to infant cues in brain regions implicated in maternal–infant bonding and empathy during the early postpartum. Breastfeeding mothers exhibited a trend toward higher maternal sensitivity during mother–infant interaction at 3–4 months postpartum as compared to formula-feeding mothers. This sensitive maternal behavior observed in dyadic mother–child interactions at 3 months has been shown to be associated with improved cognitive, social, emotional, and moral development across childhood and up to adolescence (Feldman, 2007; Isabella & Belsky, 1991).

Breastfeeding Rates in the United States

It is with these benefits for mother and child in mind that the following recommendations have been made. The American College of Obstetricians and Gynecologists (ACOG, 2007) recommends exclusive breastfeeding for 6 months. The American Academy of Pediatrics (AAP, 2005) and the American Academy of Family Physicians (AAFP, 2008) also recommend exclusive breastfeeding for 6 months, continuing at least through the infant's first birthday, and as long thereafter as is mutually desired. The World Health Organization (WHO, 2001) recommends exclusive breastfeeding for 6 months and at least 2 years of breastfeeding for all infants.

In spite of these recommendations, breastfeeding rates in the U.S. remain suboptimal. In 2011, 74.6% of U.S. infants were breastfed at least once after delivery, 44.3 % were breastfeeding at 6 months, and 23.8% were breastfeeding at 12 months. Moreover, 35.0% of infants were exclusively breastfed at age 3 months, and just 14.8% were exclusively breastfed at age 6 months (CDC, 2011). In Florida, 79.5% of infants were ever breastfed, 39.0% were breastfed at 6 months, and 20.2% were breastfed at 12 months (CDC, 2011). With regards to breastfeeding exclusively, 31.7% of Florida infants were exclusively breastfeeding at 3 months and 12.9% were exclusively breastfeeding at 6 months (CDC, 2011).

As studies show that the duration of exclusive breastfeeding and how long a mother continues to breastfeed thereafter are more meaningful predictors of health, the concerns of the public health community extend beyond breastfeeding rates to include low exclusivity and durations rates as well (Bachrach, Schwartz, & Bachrach, 2003; Kramer et al., 2003; Chantry, Howard, & Auinger, 2006; Ip et al., 2007). The CDC (2011) reports that nationally, 24.5% of babies receive formula before 2 days of age. In Florida, 31.4% of infants receive formula before 2 days of age.

Previous studies have found that breastfeeding rates vary by race and ethnicity (Forste, Weiss, & Lippincott, 2001; CDC, 2004, 2010; Gill, 2009). Research also shows that younger maternal age, lower maternal education, and being unmarried are associated with not breastfeeding (Grummer-Strawn & Shealy, 2009).

In sum, the benefits of breastfeeding are well documented and generally well known. However, breastfeeding rates continue to be sub-par. It is important to understand the factors that influence a mother's decision to breastfed. Furthermore, it is important to understand how

women respond to various health messages promoting breastfeeding.

Health Behavior Theories and Behavioral Intentions

Understanding the determinants of a given behavior is a necessary step in developing an effective communication to change that behavior (Fishbein & Cappella, 2006). Health communication professionals generally turn to theories of behavioral prediction and behavior change as a framework to help identify the determinants of a specific behavior. There are many theories of behavioral prediction such as the Theory of Planned Behavior (Ajzen, 1991), the Protection Motivation Theory (Rogers, 1975), the Health Belief Model (Rosenstock, 1974), Social Cognitive Theory (Bandura, 1977), and the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Fishbein and Cappella (2006) posit that any given behavior is most likely to occur if one has a strong intention to perform the behavior, has the necessary skills and abilities required to perform the behavior, and there are no environmental or other constraints preventing behavioral performance.

Behavioral intention represents a person's motivation to perform the target behavior (Conner & Sparks, 2005). Fishbein and Cappella (2006) state that there are three primary determinants of intention: attitude toward performing the behavior, perceived norms concerning performance of the behavior, and self-efficacy with respect to performing the behavior. The authors suggest that the weight of these psychosocial variables as determinants of intention will depend upon both the targeted behavior and population. Whereas one behavior may be primarily determined by attitudinal considerations, another may be predominantly influenced by self-efficacy.

Several of the widely employed health behavior prediction theories interpret intention to act as the most immediate and important predictor of the subsequent action (Sheeran, Milne, Webb, & Gollwitzer, 2005). Ajzen (1991) suggests that intentions are the culmination of the decision-making process; they mark the end of deliberation about a behavior and reflect the standard of performance that will be expended during action.

Studies have used a mixture of single-item and reliable multi-item measures that ask respondents to indicate whether they intend to, plan to, are likely to, or are willing to engage in a behavior (e.g. 'Do you plan to follow a low-fat diet for at least the next six months?'; Plotnikoff and Higginbottom, 1998). Often respondents are asked to indicate their intention to perform a behavior either at some point in the future (e.g. 'In the future I will use dental floss regularly';

Sheeran and Orbell, 1996) or without a time frame (e.g. 'I intend to drink within safe limits as a regular habit'; Murgraff, White, & Phillips, 1999). (Norman, Boer & Seydel, 2005)

Investigating how well intentions predict behaviors, Sheeran (2002) conducted a meta-analysis of meta-analyses testing the intention-behavior relationship. Across 422 studies, intentions accounted for 28 percent of the variance in behavior, on average. According to Cohen's (1992) power primer, $R^2 = 0.28$ constitutes a 'large' effect size, which suggests that intentions are 'good' predictors of behavior. This meta-analysis found that, across studies of exercise, condom use and cancer screening, the median proportion of participants with positive intentions who did not perform the behavior was 47 percent (Sheeran, 2002). Thus, these findings indicate that a little more than half of the people with positive intentions to engage in health behaviors successfully translate those intentions into action.

Breastfeeding Intentions

A number of factors influence a woman's decision to initiate and continue to breastfeed. These factors include social and cultural norms, social support, guidance and support from health-care providers, work environment, and the media (Khoury et al, 2005; CDC, 2010). Mitra, Khoury, Hinton, and Carothers (2004) found fewer children, past breastfeeding experience, breastfeeding knowledge, self-efficacy, and perceived social support predicted breastfeeding intention. Women are more likely to breastfeed if they have a positive attitude toward breastfeeding (Black, Blair, Jones, & Durant, 1990; Freed, Jones, & Schanler, 1992; Wambach, 1997; Tarkka, Paunonen, & Laippala, 1999; Mahoney & James, 2000). Conversely, women with negative breastfeeding attitudes, such as perceptions of lifestyle restrictions, physical discomfort, and inconvenience, are more likely to formula-feed (Avery, Duckett, Dodgson, Savik, & Henly, 1998; McLorg & Bryant, 1989).

Women's behavioral beliefs associated with breastfeeding intention include the perceptions that it is healthier for babies and promotes maternal-infant bonding; it is more natural, economic, convenient, satisfying; and it is more enjoyable for the mother (Libbus & Kolostov, 1994; Dennis, 2002; Khoury, Moazzem, Jarjoura, Carothers, & Hinton, 2005;). Women who feed their infants formula, on the other hand, state that it is easier, less embarrassing, more compatible with work or school, not associated with uncomfortable complications such as sore nipples, more reassuring because they can visualize the amount of milk the baby is ingesting, and easier for

someone else to feed the baby when necessary (Dennis, 2002; Khoury, Moazzem, Jarjoura, Carothers, & Hinton, 2005).

Donath and Amir (2003) found prenatal intention to breastfeed had an influence on both initiation and duration of breastfeeding. Of the women intending to bottle feed from birth, only 3.4% initiated breastfeeding compared with 96.6% of women planning to breastfeed for at least four months. Logistic regression, using intended duration as the only explanatory variable, correctly predicted 91.4% of breastfeeding initiation and 72.2% of infant feeding at six months.

Moore and Coty (2006) conducted focus group interviews with pregnant women for the purpose of examining perceptions about anticipated barriers and facilitators that influenced breastfeeding. Many of the women indicated that they were unsure of what to expect with breastfeeding stating that health care providers gave little information or advice about breastfeeding prenatally. The majority of participants reported that they were not very confident in their ability to successfully breastfeed. Moore and Coty (2006) state that beliefs regarding the relative ease or difficulty of behavioral performance may be unrealistic when a person has little information about and no experience with the behavior. Hearing about the benefits of breastfeeding from a greater number of different sources, from family members, from the baby's father, and from lactation consultants is also positively correlated with breastfeeding intention (Humphreys, Thompson, & Miner, 1998).

O'Campo et al. (1992) found maternal confidence influenced breastfeeding duration. Women with low confidence in their perceived ability to breastfeed were at three times the risk of discontinuing breastfeeding when compared with very confident women who were breastfeeding. Similarly, Buxton et al. (1991) found that 27% of women who had low maternal confidence during pregnancy discontinued breastfeeding within the 1st postpartum week in comparison with only 5% of the highly confident women. Using the Breastfeeding Self-Efficacy Scale, Dennis and Faux (1999) found maternal breastfeeding confidence to be significantly related to breastfeeding behaviors at 6 weeks postpartum. (Dennis, 2002)

Historically, the Theory of Planned Behavior (TPB) has guided studies investigating breastfeeding intentions (Manstead, Proffitt, & Smart, 1983; O'Campo, Faden, Gielen, & Wang, 1992; Wambach, 1997; Duckett et al., 1998; Bai et al., 2010; Dyson et al., 2010). According to the TPB (Ajzen, 1991), behavioral intention is a direct function of (1) attitudes toward the behavior, (2) subjective norms toward performing the behavior, and (3) perceived behavioral

control; each construct influenced by underlying beliefs. Attitude is determined by behavioral beliefs that performing the behavior will lead to certain outcomes and is weighted by the evaluation of those outcomes. Subjective norm is determined by normative beliefs of what valued social referents think about performing the behavior, and is weighted by the general motivation to comply with those referents. Perceived behavioral control is determined by the ease or difficulty associated with performing the behavior. Attitude toward breastfeeding, normative beliefs, and perceived behavioral control have all demonstrated significant associations with breastfeeding intentions, in accordance with the propositions of the TPB (Manstead, Proffitt, & Smart, 1983; O'Campo, Faden, Gielen, & Wang, 1992; Wambach, 1997; Duckett et al, 1998; Bai et al., 2010).

Due to the complexity of the behavior, health professionals face many challenges in the promotion of breastfeeding. Breastfeeding behavior has a number of distinctive features that separate it from any other preventive health behavior. While the majority of risks examined in prior studies focus on risks concerning personal health, the risks associated with not breastfeeding impact both mother and child. In addition, breastfeeding differs from traditional health risk perceptions in that there are multiple risks involved, risks that impact the immediate and long-term health of mother and child. Moreover, because many of the health benefits associated with breastfeeding are not immediately observable, mothers may not be as worried about the risks associated with not adopting the behavior.

Furthermore, while breastfeeding benefits both mother and child, there are also many perceived costs for the mother. Concerns include worry that the behavior requires a lot of time, is often considered embarrassing, and can be temporarily uncomfortable (La Leche League International, 2012). These issues point to the importance of communicating information about breastfeeding in a way that addresses perceived barriers and is well received by future mothers.

In summation, a number of factors influence a woman's decision to breastfeed. Intentions have been found to be significant predictors of breastfeeding initiation and duration. While the benefits of breastfeeding are generally well-known, a number of barriers and challenges are associated with the behavior. Breastfeeding as a health protective behavior differs from other health behaviors in a number of ways. The complex and sensitive nature of this behavior presents a number of challenges for health professionals attempting to promote breastfeeding.

Protection Motivation Theory

Similar to the TPB, the Protection Motivation Theory (PMT) also includes measures of behavioral beliefs (response efficacy and costs) and perceived behavioral control (self-efficacy). However, in addition to these measures, PMT also considers risk perceptions (severity and vulnerability). Prior research suggests that any attempt to predict when people will take precautions against illness or injury should take risk perceptions into account (Weinstein, 2000). Much evidence suggests that risk perceptions—or beliefs about personal vulnerability to a negative health outcome—are related to health behavior and the processing of health information (Janz & Becker, 1984; Rogers, 1975; Rosenstock, 1974).

To ensure that health promotion messages are communicated persuasively, many researchers have applied Protection Motivation Theory to focus on the cognitive processes that mediate behavior change (Gage et al, 2012). Protection Motivation Theory (Rogers, 1975) suggests that the likelihood of individuals adopting health-protecting behaviors, such as breastfeeding, depends on their perceptions of the severity of the threat, probability of the threat occurring, efficacy of the recommended protective behavior, and self-efficacy that they can perform the preventive behavior.

The origins of PMT can be traced to early work on the persuasive impact of fear appeals on attitudes and behavior (Norman, Boer & Seydel, 2005). The basic premise being that if a communication evokes fear the recipient will be motivated to reduce this unpleasant emotional state. Hovland et al. (1953) proposed that there are three main stimulus variables in a fear appeal: (a) the magnitude of noxiousness or severity of an event, (b) the probability of the event occurrence if no protective behavior is adopted, and (c) the efficacy of a recommended coping response to reduce or eliminate the noxious event. These variables were included by Rogers (1975) in the original formulation of PMT. Rogers (1983) subsequently revised PMT proposing that various environmental (e.g. fear appeals) and intrapersonal (e.g. personality) sources of information can initiate two independent appraisal processes: threat appraisal and coping appraisal. Together, threat and coping appraisals determine an individual's intentions (protection motivation) to engage in the targeted behavior.

According to Protection Motivation Theory (Rogers, 1975), threat appraisal focuses on the components of a fear appeal relevant to an individual's perceived threat and factors that impact the probability of maladaptive responses (e.g. avoidance). PMT proposes that people

consider the perceived intrinsic and extrinsic rewards accompanying the behavior (in this study, the behavior would be formula feeding, or not breastfeeding) minus the perceived severity of the threat and their perceived vulnerability to this threat. Greater levels of fear will be aroused if an individual perceives him or herself to be vulnerable to a serious health threat and this will increase an individual's motivation to engage in protective behavior.

In the coping appraisal process, people consider the effectiveness of an adaptive response to alleviate the threat (response efficacy) and the negative implications of enacting the response (response cost). In this process people also consider their ability to successfully perform the adaptive response (self-efficacy). An individual will be more likely to intend to adopt the recommended coping response if he or she believes the response will be effective in reducing the threat (i.e. response efficacy) and they are capable of performing the recommended behavior (i.e. self-efficacy). In order for perceptions of response efficacy and self-efficacy to increase the probability of an adaptive response, they need to outweigh perceived costs or barriers (e.g. time) that inhibit performing the adaptive behavior.

Protection motivation (i.e. intention to perform a recommended behavior) results from the two appraisal processes and is a positive function of perceptions of severity, vulnerability, response efficacy and self-efficacy, and a negative function of the intrinsic and extrinsic rewards (of not breastfeeding), and response costs of the adaptive behavior (Norman, Boer & Seydel, 2005). The concept of protection motivation involves any threat for which there is an effective recommended response that can be carried out by the individual. PMT has been used to predict a range of health promoting and health compromising behaviors such as exercise, diet, smoking, binge drinking, sexual behaviors, screening behaviors, and treatment adherence (Norman, Boer, & Seydel, 2005).

It has been suggested that individuals who feel particularly vulnerable to a health threat in the absence of an effective coping response may experience high levels of anxiety and thereby adopt a strategy to reduce the fear associated with the threat without dealing with the threat itself. (Norman, Boer, and Seydel, 2005). These strategies are referred to as maladaptive coping responses and include strategies such as denial and avoidance. It is suggested that high levels of perceived vulnerability and severity and low levels of response efficacy and self-efficacy may result in the adoption of maladaptive coping responses (Norman, Boer & Seydel, 2005).

Previous studies have found the PMT can be usefully applied to predict maladaptive coping responses in addition to adaptive responses. Ben-Ahron et al. (1995) considered maladaptive coping responses in relation to binge drinking. Avoidance was predicted by a negative relationship between perceived severity and self-efficacy. Hodgkins and Orbell (1998) found that the response costs associated with breast self exams were predictive of the use of avoidance as a coping strategy.

Floyd et al. (2000) conducted a meta-analysis of PMT studies. Of the 65 studies reviewed, 16 measured only one PMT component, whereas 49 contained multiple PMT components. In addition, 27 of the studies measured intention, 22 measured only behavior, and 16 measured both intention and behavior. Floyd et al. (2000) reported d_+ (sample weighted standardized mean differences) as an estimate of the effect size for each component. Cohen (1992) suggests that d_+ values of 0.20, 0.50, and 0.80 represent small, medium, and large effect sizes.

The effect sizes for the threat appraisal variables (i.e. rewards, perceived severity and vulnerability) were in the small to medium range (0.39 – 0.54). In contrast, the effect sizes for the coping appraisal variables (i.e. perceived response efficacy, self-efficacy and response costs) were in the medium to large range (0.39 – 0.88). Self-efficacy was found to have the largest effect size (0.88). Floyd et al. (2000) also examined the performance of PMT in relation to the prediction of intention versus behavior. Both the threat and coping appraisal variables were found to have larger effect sizes when intention was the dependent variable compared to when behavior was the dependent variable.

This pattern of results was, to a large extent, replicated in a more detailed meta-analysis of PMT studies conducted by Milne et al. (2000). Milne et al. (2000) employed stricter inclusion criteria so that only empirical applications of PMT to health-related intentions, concurrent behavior or future behavior were included in the meta-analysis—resulting in the inclusion of only 12 studies. The majority of the studies were concerned with the prediction of intention. Milne et al. (2000) reported r_+ (sample weighted average correlations) as an estimate of the effect size for each component of PMT. Cohen (1992) suggests that r_+ values of 0.10, 0.30, and 0.50 represent small, medium and large effect sizes, respectively.

Considering the prediction of intention, significant effects were found for all PMT components. Small effect sizes were found for the threat appraisal variables (0.10 – 0.20),

whereas the effect sizes for the coping appraisal variables (0.29 – 0.34) were in the medium to large range. Response costs had the largest effect size (0.34), followed by self-efficacy (0.33). Each of the components of PMT is described below.

Perceived Vulnerability

According to PMT, perceived vulnerability should be positively related to health-protective intentions and behavior. Previous research has supported this hypothesis, reporting a positive relationship between risk perceptions and individuals' attitudes, beliefs and intentions toward adopting preventive behaviors; the higher the perceived risk, the more likely a person will partake in a recommended behavior (Weinstein, 1989; Aspinwall et al, 1991; Eppright, Tanner & Hunt, 1994; Gerrard, Gibbons, & Bushman, 1996; Orbell & Sheeran, 1998; Chapin, 2001; Norman, Boer, & Seydel, 2005). For example, compared to a woman who thinks she has a low risk of developing breast cancer, a woman who thinks her risk is high will be more likely to have yearly mammograms (McCaul, Branstetter, Schroeder, & Glasgow, 1996; Klein, 2007).

However, looking specifically at perceived vulnerability as included in PMT, prior meta-analyses have found perceived vulnerability to be a relatively weak predictor of intention (Floyd et al., 2000; Milne et al., 2000). These results reflect a number of studies that report significant negative correlations between perceived vulnerability and intentions to exercise (Plotnikoff and Higginbottom, 2002), drink within safe limits (Ben-Afron et al., 1995), use condoms (Van der Velde and Van der Pligt, 1991), limit the number of sexual partners (Abraham et al, 1994), and participate in cancer screening programs (Seydel, Taal, & Wiegman, 1990). In instances where perceived vulnerability has been found to have a negative relationship with health-protective intentions and behavior, a possible explanation may be maladaptive styles of coping (Norman, Boer, & Seydel, 2005).

Perceived vulnerability has been assessed using multi-item scales with good levels of internal reliability (Norman, Boer & Seydel, 2005). The perceived vulnerability items often focus on the individuals' chances of experiencing the health threat at some point in the future (e.g. 'My chances of developing breast cancer in the future are ... very low/very high'; Hodgkins and Orbell, 1998). Another approach is to ask respondents to provide vulnerability ratings if a recommended behavior is not performed (e.g. 'If left untreated, what are the chances that your child's visual impairment will affect his/her reading ability?'; Norman et al, 2003). Van der

Velde and Hooykass (1996) argue that the latter may provide a more accurate assessment of the perceived vulnerability construct as outlined in PMT.

Perceived Severity

While an individual may perceive that they are vulnerable to a health risk, if the health risk is not considered severe, the individual will likely not be motivated to adopt precautionary measures against the threat. As mentioned earlier, perceived severity has been found to have small effect sizes in relation to the other PMT components (Floyd et al., 2000; Milne et al., 2000). Previous PMT studies have measured perceived severity with single items (Orbell and Sheeran, 1998; Plotnikoff and Higginbottom, 1998). When multi-item scales have been used these are often found to have poor internal reliability (e.g. Abraham et al, 1994; Boer and Seydel, 1995; Taylor and May, 1996), although there are some exceptions (Sheeran and Orbell, 1996; Norman et al, 2003).

Intrinsic and Extrinsic Rewards

According to PMT, the overall appraisal of the threat can be determined by summing the rewards, severity, and vulnerability. Extrinsic rewards (e.g. social approval) and intrinsic rewards (e.g. bodily pleasure) associated with the undesired behavior tend to decrease the adoption of a protective behavior. Rewards have been found to have small effect sizes in relation to the other PMT components (Floyd et al., 2000). Multi-item scales have been used to measure intrinsic and extrinsic rewards (Abraham, Sheeran, Abrams, & Spears, 1994; Neuwirth, Dunwoody, & Griffin, 2000; Stanton et al, 2004; Gong et al, 2009). An example of how this was done is “Sex would be more exciting without a condom” (*strongly agree to strongly disagree*).

Self-efficacy

The concept of self-efficacy is derived from Social Cognitive Theory (Bandura, 1986) and refers to a person’s belief in her/his abilities to perform a given action. In health behavior research, self-efficacy has been found to be a major determinant of motivation to engage in a healthy behavior (De Vries & Backbier, 1994; Strecher, DeVellis, Becker, & Rosenstock, 1986). Research has shown that when it comes to adopting healthy behaviors that are perceived to be challenging or complex, “self-efficacy considerations are probably paramount” (Strecher, DeVellis, Becker, & Rosenstock, 1986, pp.87). In the case of breastfeeding, if a mother believes

that exclusive breastfeeding is important but is not confident in her ability to maintain her milk supply or determine if the baby is receiving sufficient breast milk, then it is unlikely that she will refrain from using formula.

Self-efficacy is typically assessed with multi-item scales with good levels of internal reliability in PMT studies (Norman, Boer & Seydel, 2005). The self-efficacy items tend to focus on individuals' overall levels of confidence or perceived ability to perform the behavior (e.g. 'I am capable of starting and continuing drinking at safe levels'; Murgraff, White, & Phillips, 1999), or on their perceptions of the ease or difficulty of performing the behavior (e.g. 'I would find it easy to suggest using a condom to a new partner'; Abraham et al, 1994). Some studies ask respondents to rate their confidence that they can perform a behavior when faced with specific obstacles (e.g. 'Choose mainly low-fat foods when you feel too lazy to prepare a meal'; Plotnikoff and Higginbottom, 1998). Respondents may also be asked to indicate the extent to which specific obstacles may prevent them from performing the behavior (e.g. Boer and Seydel, 1995; Orbell and Sheeran, 1998).

In developing self-efficacy expectations, Bandura (1977, 1986) identified four primary sources of information: (a) previous experience with the specific behavior, (b) previous observation of the performance of the specific behavior, (c) encouragement of influential others, and (d) physiological responses. In relation to breastfeeding self-efficacy, a mother determines her capability to breastfeed her infant based on whether she has previous breastfeeding experience, observed successful breastfeeding behaviors by others, or received encouragement from significant others to breastfeed (Dennis, 2003).

Self-efficacy expectancies not only influence which behaviors individuals will engage in, but also how much effort they expend, how long they persist when faced with obstacles, and whether they maintain self-debilitating or self-encouraging cognitions (Dennis, 2003). Breastfeeding self-efficacy is believed to be a salient variable in breastfeeding duration, as it predicts (a) whether a mother chooses to breastfeed, (b) how much effort she will expend, (c) whether she will endure challenges, (d) whether she will have self-enhancing or self-defeating thoughts, and (e) how she will respond emotionally to breastfeeding difficulties (Dennis, 2003).

The Breastfeeding Self-Efficacy Scale (BSES) (Dennis & Faux, 1999), a 33-item, self-report instrument, was developed to measure breastfeeding confidence. Dennis (1999) developed the breastfeeding self-efficacy theoretical framework based on Bandura's (1977)

social cognitive theory. All items are preceded by the phrase “I can always” and anchored with a 5-point Likert-type scale where 1 indicates not at all confident and 5 indicates always confident. Dennis (2003) found support for the reliability of the BSES with a Cronbach’s alpha coefficient of 0.96, with 73% of all corrected item-total correlations ranging between 0.30 and 0.70.

Response Efficacy

Response efficacy has been found to have medium to large effect sizes when predicting behavioral intention (Floyd et al., 2000; Milne et al., 2000). Many PMT studies have used reliable multi-item measures to assess response efficacy (e.g. Plotnikoff and Higginbottom, 2002; Sheeran and Orbell, 1996), although a number of studies have employed single item measures (e.g. Eppright et al, 1994; Greening, 1997; Murgraff, White, & Phillips, 1999). Response efficacy items typically focus on the effectiveness of the behavior to reduce the health threat (e.g. ‘Regular exercise will reduce my chances of having a heart attack’; Plotnikoff and Higginbottom, 2002). However, some studies have focused on other positive outcomes of performing the behavior, such as psychological well-being (e.g. ‘The test will give me peace of mind’; Orbell and Sheeran, 1998).

Response Costs

While response and self-efficacy increase the likelihood of an adaptive coping behavior, response costs decrease the probability of an adequate reaction to a threat; the relationship is thought to be linear and additive (Neuwirth, Dunwoody, & Griffin, 2000). As previously discussed, the negative implications (i.e. time, pain, embarrassment) associated with implementing a behavior have been found to have large effect sizes in regards to behavioral intention (Floyd et al., 2000; Milne et al., 2000). In prior PMT studies, response costs have assessed with reliable multi-item scales (Norman, Boer & Seydel, 2005). The items typically focus on various negative aspects of performing the behavior (e.g. ‘The test will make me feel anxious’; Orbell and Sheeran, 1998).

Negative Affect

One critique of PMT questions the extent to which the theory recognizes the importance of emotional responses to fear appeals (Tanner et al., 1991). Emotion is recognized as an important component in many health behavior models (Consedine et al, 2004; Mayne, 1999).

These models propose that communications concerning health should provoke some degree of fear or anxiety, and in turn, motivate an individual to adopt a specific health behavior in an effort to reduce that fear. While PMT is founded on the belief that when fear is evoked the recipient will be motivated to reduce this unpleasant emotional state, the model does not include a measure of negative affect.

It has been suggested that the purpose of affect is to induce states of ‘action readiness’ that make the individual responsive to a specific environment or context (Frijda, 2007). Emotions like fear, anxiety, and worry rarely occur in an unregulated state; because of their strong motivational qualities, people are impelled to regulate most emotional experiences (Consedine et al, 2004).

However, a review of the literature on negative affect yields mixed results. While negative affect has been found to be associated with the adoption of healthy behaviors, it has also been found to be associated with poor health behaviors and a lack of adherence to preventive practices (Mayne, 2007; Moser et al., 2007; Mullens, McCaul, Erickson & Sandgren, 2004). For example, messages that induce fear have been found to be effective in changing attitudes, intentions, and health behavior (Janis & Feshbach, 1953; Leventhal, 1971), unless the message generates a sense of intense fear resulting in hopelessness (Rosen, Terry, & Leventhal, 1982).

Moreover, the negative affect literature lacks a consensus as to whether fear, anxiety, and worry represent the same emotional construct or whether they are separate with overlapping characteristics. While some researchers use fear, anxiety and worry interchangeably assuming they measure the same underlying concept, others argue that they are in fact distinct emotions generating different responses. According to the literature referencing these as separate constructs, anxiety is chronic, generally yields non-adaptive behaviors, is neither specific nor requires immediate actions (Lief, 1967). Fear is acute, generally yields adaptive behaviors, and requires a specific threat and immediate action (Lief, 1967). Worry is neither acute nor chronic, generally yields adaptive coping strategies, focuses on a specific danger and does not require immediate action (Bay & Algase, 1999). Both fear and worry, when extreme, can potentially generate non-adaptive behaviors. Based on these considerations, this study will focus on worry as a measure of negative affect.

Studies have shown that worry leads individuals to engage in active problem-solving, and is associated with preventive behaviors such as vaccinations (Chapman & Coups, 2006).

However, the studies examining feelings of worry as potential influencers of adoption of healthy behaviors have produced mixed results. Some concluded that feeling of worry increased motivation or intention to engage in health behaviors (McQueen, Vernon, Meissner & Rakowski, 2008; Chapman & Coups, 2006; Mullens, McCaul, Erickson & Sandgren, 2004). Others indicated that excessive feelings of worry were associated with avoidance strategies. These studies suggested that people reporting higher negative affect were less likely to adopt healthy practices (Hay, Buckley & Ostroff, 2005). Overall, the literature reflects a slight bias towards a positive relationship between worry and the adoption of health behaviors.

Moreover, worry has been found to be related to risk perceptions (Klein, 2003). Individuals' understanding of risk and their affective reactions influence the steps taken to reduce, eliminate or avoid health threats (Moser et al., 2007, Hay Buckley & Ostroff, 2005; Sweet, Willis, Ashida & Westman, 2003). The dual-process theories related to information processing suggest that threat messages generate both illness-related thoughts and emotions (Leventhal, Safer, & Panagis, 1983). According to this approach, worry represents the emotional aspect of processing and risk perception characterizes the cognitive component of processing (Lowenstein, et al., 2001; Hay, Buckley & Ostroff, 2005). Turner and Stets (2005) similarly suggested that rationality and decision-making were dependent on emotions.

Message Framing

As mentioned previously, health professionals seek to present health information in a way that maximizes its impact on people's beliefs and behavior. For health messages to be effective, people must recognize the personal relevance of health information and be motivated to either initiate or continue healthy behavioral practices (Rothman, Bartels, Wlaschin, & Salovey, 2006). Research on message framing represents one approach to understanding factors that enhance message effectiveness (Rothman et al, 2006; Rothman, Martino, Bedell, Detweiler, & Salovey, 1999; Schneider et al., 2001).

Information about a health behavior can emphasize the benefits of taking action (i.e., a gain-framed appeal) or the costs of failing to take action (i.e., a loss-framed appeal). It is important to note that gain-framed statements can refer to both good things that will happen and the bad things that will not happen, whereas loss-framed statements can refer to bad things that will happen and good things that will not happen (Rothman et al, 2006). This simple variation in how health information is framed proves important because research has shown that although the

content of gain- and loss-framed messages can be factually equivalent, emphasizing either the benefits of adopting a particular behavior or the costs of failing to adopt a behavior can alter a message's persuasive impact, differentially affecting individuals' judgments, decisions, and behaviors (Tversky & Kahneman, 1981; Kalichman & Coley, 1995; Rothman & Salovey, 1997; Levin, Schneider & Gaeth, 1998; Rothman, Kelly, Hertel, & Salovey, 2003; Mann, Sherman, & Updegraff, 2004; Rothman, Bartels, Wlaschin, & Salovey, 2006).

While early investigations on framing can be seen in the fear appeal research dating back decades, the reasoning suggesting that framing information can differentially affect people's behavioral decisions stems from the Prospect Theory (Tversky & Kahneman, 1981). According to the framing postulate of the Prospect Theory, when faced with two choices—one posing little risk and one posing some higher degree of risk—a person's preference for one option over the other will be influenced by the manner in which the choices are framed. If the choices emphasize potential losses, individuals are often willing to choose a risky option to prevent those losses (they are risk seeking in their preferences). However, if the choices emphasize potential gains, individuals are generally less willing to choose options involving risk to secure those gains (they are risk averse in their preferences). (Latimer et al., 2012)

While the literature on framing of health messages is extensive, studies show inconsistent results with regard to which type of framing is more persuasive (O'Keefe & Jensen, 2006, 2007). Rothman and Salovey (1997) argue that the relative effectiveness of a gain- or loss-framed appeal is contingent on the type of health behavior that is promoted. The authors maintain that when people are considering a behavior that they perceive to involve some risk (e.g., it may detect a health problem), loss-framed appeals are more persuasive. On the other hand, when people are considering a behavior that they perceive involves a relatively certain outcome (e.g., prevention of a health problem), gain-framed appeals are more persuasive.

In a study conducted by Rothman et al (1999), participants were given a gain- or loss-framed brochure about a behavior—gargling with mouth rinse—that described an effective way to either prevent the buildup of dental plaque (i.e., a prevention behavior) or detect the buildup of dental plaque (i.e., a detection behavior). Consistent with findings that had been observed across studies, the persuasiveness of the framed brochure was contingent on the function served by the mouth rinse. When the mouth rinse was presented as a way to prevent the buildup of plaque, participants were more likely to request a free sample of the product after having read a gain-

framed pamphlet. However, when the mouth rinse provided a way to detect the buildup of plaque, participants were more likely to request a free sample after having read a loss-framed pamphlet (Rothman et al., 1999). The findings of this study were replicated by Rivers et al (2005) in an intervention designed to promote pap tests—the persuasive impact of gain- and loss-framed messages was contingent on whether a pap test was characterized as a prevention behavior or a detection behavior (Rivers et al., 2005).

Further evidence supporting the use of loss-framed messages for detection behaviors has been found for breast self-exams and mammography's (Meyerowitz & Chaiken, 1987; Banks et al., 1995; Cox & Cox, 2001; Schneider et al., 2001), HIV testing (Kalichman & Coley, 1995), a viral test for a hypothetical illness (Rothman, Martino, Bedell, Detweiler, & Salovey, 1999), and a mouth rinse to detect gum disease (Rothman et al., 1999). Additional supporting evidence for the use of gain-framed information in promoting healthy behavioral practices has included requests for a free sample of sunscreen (Detweiler et al, 1999; Rothman et al, 1993), intentions to use condoms (Linville, Fischer, & Fischhoff, 1993), and positive exercise intentions (Gray & Harrington, 2011).

While Rothman and Salovey's (1997) hypotheses have been the leading predictions in health message framing research to date, recent meta-analyses specifically examining the role of framing in promoting health behaviors have found limited support for Rothman and Salovey's predictions (O'Keefe & Jensen, 2007, 2009). For preventive health behaviors, O'Keefe and Jensen (2007) found a significant but weak advantage of gain-framed messages over loss-framed messages (effect size $r = 0.032$, $p = 0.015$). In particular, the strongest effects were found for studies that promoted preventive dental hygiene behaviors ($r = 0.154$) while other effect sizes ranged from $r = 0.018$ (safe-sex behaviors) to $r = 0.110$ (exercise). O'Keefe and Jensen (2007) reported that when behaviors other than dental hygiene are considered, no statistically significant advantage of either a gain- or loss-framed message was observed.

When reviewing detection health behaviors, O'Keefe and Jensen (2009) found that loss-framed messages showed a significant but also weak advantage over gain-framed messages ($r = 0.039$, $p = 0.020$). Again, a single type of behavior (breast cancer detection, $r = 0.056$) accounted for the loss-frame advantage. Excluding breast cancer studies from the analysis, no significant advantage of either a loss- or gain-framed message was observed from the remaining subset of studies.

Building on the meta-analysis conducted by O’Keefe and Jensen (2006), Gallagher and Updegraff (2012) reviewed health message framing research with a focus on studies that assess behavior as an outcome. Whereas O’Keefe and Jensen (2007, 2009) combined effect sizes for multiple outcome measures, Gallagher and Updegraff (2012) distinguished between the common outcomes used to assess the persuasive impact of framed messages, running separate analyses for attitudes, intentions, and behavioral responses.

In line with O’Keefe and Jensen (2006), Gallagher and Updegraff (2012) observed no significant moderating effect of framing on the persuasiveness of health messages when persuasiveness was assessed as either attitudes towards the behavior ($Q(1)=1.209, p=0.272$) or intentions to perform the behavior ($Q(1)=1.588, p=0.208$). However, contrary to O’Keefe and Jensen (2006), gain-framed messages were significantly more persuasive than loss-framed messages in promoting actual preventive health behavior ($Q(1)=11.635, p=0.001$). With regards to detection behavior, loss-framed messages were not significantly more likely than gain-framed messages to promote behavior. (Gallagher & Updegraff, 2012)

Thus, a distinction between prevention and detection behaviors does not seem to be sufficient to explain differences between the effects of gain- versus loss-framed information. Latimer and colleagues (2012) speculate that the lack of support for Rothman and Salovey’s (1997) prediction may have to do with the degree of variability in how individuals perceive the risks associated with a specific behavior. In the case of prevention behaviors, people may generally view such behaviors to be relatively safe and certain to engage in, and hence a reliable advantage of gain-framed messages may result. Detection behaviors, on the other hand, may represent a class of behaviors for which people have more variable beliefs about their susceptibility to a specific health condition. In some instances, individuals may perceive adopting a detection behavior as a health-affirming act. For example, people who brush and floss their teeth might feel there is little risk of having a health problem (e.g., having a cavity) and in turn consider a dental checkup as an opportunity to affirm that they are healthy (e.g., have no cavities).

Moderators of Framing

To account for the inconsistent findings surrounding framing effects, many researchers have been concerned with identifying possible moderating variables of message framing effects

(Van't Riet, 2009). Identifying factors that moderate the persuasive effects of gain- or loss-frames is of major interest for researchers, as well as for health professionals, who need to decide how to best tailor the message to the characteristics of their target group (Werrij 2011). Previous studies have identified several moderators of the message framing. These moderators include attitudinal ambivalence (Broemer, 2002), regulatory focus (Lee & Aaker, 2004), and approach/avoidance orientation (Mann, Sherman, & Updegraff, 2004; Sherman, Mann, & Updegraff, 2006). As just discussed, Latimer, Salovey, and Rothman (2007) argue that researchers should focus less on whether the recommended behavior serves to prevent or detect illness, and more on the way the recipient perceives the behavior. Recently, researchers have started investigating health message framing effects using motivational theories such as Protection Motivation Theory (Van't Riet, Ruiter, Werrij, & de Vries, 2010; Van't Riet, Ruiter, Smerecnik, & de Vries, 2010).

Perceived Risk and Message Framing

Recent research suggests that individuals' perceptions of the level of risk of particular behaviors interact with the message frame to predict health behaviors (Apanovitch, McCarthy, & Salovey, 2003; Hevey et al., 2010; Kiene, Barta, Zelenski, & Cothran, 2005; O'Connor, Ferguson, & O'Connor, 2005; Van't Riet, Ruiter, Werrij, & De Vries, 2010). In a study that manipulated college students' perceptions of risk for developing heart disease as an attempt to encourage cholesterol screening (Maheswaran & Meyers-Levy, 1990), loss-framed messages were more effective only when students were led to believe they were at a high risk for developing heart disease. In promoting screening mammography, Meyerowitz, Wilson, and Chaiken (1991) and Gallagher and colleagues (2011) found a loss-frame advantage only for women who considered themselves to be at high risk for breast cancer. No advantage of either frame was reported for women who felt little or no risk. A similar pattern of results was obtained in a study designed to promote interest in skin cancer screening exams (Rothman, Pronin, & Salovey, 1996). Those participants who perceived themselves to be at relatively higher risk for developing skin cancer were more interested in a screening exam if they had received loss-framed information about skin cancer.

While investigating interactions between risk perceptions and message framing of smoking cessation, Toll et al (2008) found that low perceptions of risk are sensitive to gain-

framed messages. In another study, Apanovitch, McCarthy, and Salovey, (2003) found a significant advantage for a gain-framed appeal in promoting HIV testing. In this case, women who were confident that they were not currently HIV positive were more likely to have an HIV test after having viewed the gain-framed appeal. Loss-framed messages were only somewhat more effective than gain-framed messages among those participants who believed that they were at greater risk for HIV.

In regards to the use of message framing to promote health behaviors, risk is often operationalized more broadly as people's subjective perception of the behavior. Thus, the concept of risk reflects not only the probability of a particular outcome, but also the associated feelings of worry and concern about the issue (Rothman et al, 2006).

Negative Affect and Message Framing

Considering negative affect in relation to message framing, gain-framed information is believed to elicit more positive affect than loss-framed information, and loss-framed information is believed to elicit more negative affect than gain-framed information (Chang, 2005; Cox, Cox & Zimet, 2006; Cox & Cox, 2001; Millar & Millar, 2000; Schneider et al., 2001; Shen & Dillard, 2007). Shen and Dillard (2007) point out that the focus on beneficial outcomes inherent to gain-framed messages may emphasize possible congruence between the recipient's goals and the environment/situation. Loss-framed messages, on the other hand, by focusing on costs, may emphasize possible incongruence between goals and the environment/situation. With regards to framed messages, the persuasive effects of positive and negative affect imply that gain- and loss-framed messages exert their influence on persuasion to a large extent through different channels (Van't Riet et al., 2010).

Affect, Information Acceptance, and Message Framing

There is an extensive body of literature available on the influence of affect on information processing and decision-making (Bless & Schwartz, 1999; Forgas, 1995; Isen, Daubman, & Nowicki, 1987; Isen, Nygren, & Ashby, 1988). Generally, a message is more likely to be accepted if it elicits more positive than negative cognitions or if it leads to relatively little counterarguing (Van't, Ruiters, Werrij, & De Vries, 2010). Findings suggest that affect may play an important role in the persuasion process and may be helpful in explaining the underlying

mechanisms of message framing effects (Van't Riet et al., 2010). Negative emotions are believed to narrow people's behavioral urges towards specific actions, preparing the body physically and mentally for immediate action (Fredrickson and Losada, 2005; Frijda, 2007). There is some evidence showing that negative affect, as a consequence of loss-framed information, influences intention (De Hoog, Stroebe, & De Wit, 2008; Witte, 1994).

To obtain a clearer picture of the role of positive and negative affect in message-framing effects, Van't Riet and colleagues (2010) conducted an experiment which used gain- and loss-framed messages about reducing salt intake and assessed positive affect, negative affect, information acceptance, attitude and intention. The negative affect items assessed the extent to which participants thought the statement made them feel sad (*1 - Very sad; 10 - Not sad at all*) and afraid (*1 - Very afraid; 10 - Not afraid at all*). Three items assessed information acceptance by asking participants to indicate for each statement the extent to which they agreed with the statement (*1 - I totally agree; 10 - I totally disagree*), felt that the statement was exaggerated (*1 - Very exaggerated; 10 - Not at all exaggerated*), and thought the statement was relevant (*1 - Very relevant; 10 - Not at all relevant*).

The results showed that positive affect was significantly correlated with information acceptance and attitude, whereas negative affect was significantly correlated with intention. Results of the linear regression analyses showed that gain-framed messages evoked more positive affect than loss-framed messages, whereas loss-framed messages evoked more negative affect. Also, gain-framed information resulted in higher levels of information acceptance than loss-framed information and resulted in more positive attitudes. There was no significant effect of frame on intentions.

These findings suggest that gain- and loss-framed messages exert their influence through separate channels (positive and negative affect). The authors suggest it might be the case that gain-framed information may have an effect on information acceptance and attitude through positive affect, exerting a persuading influence, whereas loss-framed information might be more likely to have an effect on intention through negative affect, exerting a motivating influence.

Response Efficacy and Message Framing

When people are confident that a health protective behavior will keep them healthy and safe, a gain-framed appeal should be effective. However, if people have reason to question the

efficacy of the behavior, performing the behavior might be considered a risky proposition as people cannot be confident that they will be protected. In which case, a loss-framed appeal should be more persuasive. To test this idea, Bartels, Elo, and Rothman (2004) conducted a study centered on the manipulation of the effectiveness of a vaccine. The authors found that the perceived effectiveness of the vaccine moderated the impact of the framed message. Participants who read a message describing the vaccine as having fairly certain outcomes (i.e., it works for nearly everyone who receives it) were best persuaded by the gain-framed article; participants presented with a message describing the vaccine as having uncertain outcomes were more persuaded by a loss-framed article.

Self-efficacy and Message Framing

Recently, Van't Riet and colleagues have proposed that self-efficacy can moderate the effects of gain- and loss-framed messages on health intentions and health behavior (Van 't Riet, Ruiter, Werrij, & De Vries, 2008, 2010). The authors hypothesized that a certain level of perceived threat is important in motivating people to perform a recommended behavior but only in combination with high self-efficacy expectations. Since loss-framed messages are generally perceived as more threatening than gain framed messages (Cox & Cox, 2001; Shen & Dillard, 2007), fear appeal research suggests that this greater sense of threat might increase persuasiveness, but only if recipients feel capable of averting the threat by performing the recommended action (Witte, 1992). Thus, when perceived self-efficacy is high, loss-framed messages might be more persuasive than gain-framed messages, whereas when perceived self-efficacy is low, gain-and loss-framed messages might not be differentially persuasive. If recipients have low self-efficacy expectations, this greater sense of threat elicited by a loss-framed message may result in decreased message acceptance due to defensive avoidance (Van 't Riet, Ruiter, Werrij, & de Vries, 2010).

In a study of anti-smoking messages targeted at current smokers, Van 't Riet, Ruiter, Werrij, and de Vries (2008) found that self-efficacy to quit smoking moderated the influence of gain- and loss-framed messages. Specifically, a loss-framed message was more persuasive for participants with high self-efficacy to quit smoking than a gain-framed message. For participants with low self-efficacy to quit smoking, there was no difference in persuasiveness between the gain-framed and loss-framed conditions.

These findings were replicated in a second study conducted by Van 't Riet, Ruiter, Werrij, and de Vries (2010) examining framed messages advocating skin self-examination. The authors found that participants with high self-efficacy who read a loss-framed communication were more motivated to perform skin self-examination than those who read a gain-framed communication. For participants with low self-efficacy to perform skin self-examination, the authors found no differences in intention between the gain- and loss-framed conditions.

In a study aimed at increasing consumption of more ecological meat, Werrij, Ruiter, Van't Riet, and de Vries (2011) also examined self-efficacy as a potential moderator of the effects of gain- and loss-framed health messages using an experimental manipulation of self-efficacy. The authors found that when self-efficacy was high, the gain-framed appeal was more persuasive than the loss-framed appeal. When self-efficacy was low, there was no difference between the gain- and loss-framed messages. The finding that the effects of framed health messages were moderated by self-efficacy is in line with earlier findings (Van 't Riet et al., 2008, 2010). However, in contrast to previous work, this study revealed a gain-framed advantage instead of a loss-frame advantage for people high in self-efficacy. The authors suggest that one possible explanation for this gain-frame preference might be that perceptions of risk within the study sample may have been low (Werrij, Ruiter, Van't Riet, & de Vries, 2011).

Information Acceptance, Self-efficacy, and Message Framing

Loss-framed messages have been found to evoke a greater sense of threat than gain-framed messages (Cox & Cox, 2001; Shen & Dillard, 2007). Fear appeal research suggests that this greater sense of threat might increase persuasiveness, but only if recipients feel capable of averting the threat by performing the recommended action (Rogers, 1983; Stephenson & Witte, 1998; Witte, 1992, 1994). If recipients have low self-efficacy levels, however, this greater sense of threat may result in maladaptive responses such as less message acceptance due to defensive avoidance.

Building on both social cognitive theory (Bandura, 1986) and fear-appeal research (Ruiter et al., 2001), Van't Riet, Ruiter, Werrij, and de Vries (2010) conducted a study investigating whether self-efficacy can moderate the effects of framed health-promoting messages. The experiment had two main outcome measures: 1) intention to engage in monthly skin self-examination, and 2) information acceptance as a measure of defensive avoidance. A

meta-analysis by Good and Abraham (2007) indicates that measuring information acceptance is a valid way to assess defensive reactions. Their findings revealed that participants with low self-efficacy were less likely to accept information about skin self-examination than those with high self-efficacy. Additionally, the loss-framed communication resulted in lower levels of information acceptance than the gain-framed communication. These results suggest that the combination of having low self-efficacy and receiving a loss-framed communication might render an individual likely to process this information defensively. The interaction between message frame and self-efficacy, however, was not significant.

Summary and Conclusions

A number of conclusions can be drawn from the previous literature. While the wide-ranging and long-term protective effects of breastfeeding are well documented, breastfeeding rates in the United States can be improved. Research shows that many factors influence a woman's decision to initiate and continue to breastfeed, including past breastfeeding experience, breastfeeding knowledge, breastfeeding efficacy and costs, and self-efficacy. Generally, the Theory of Planned Behavior (TPB) has guided studies investigating breastfeeding intentions.

Prior research suggests that any attempt to predict when people will take precautions against illness or injury should take risk perceptions into account, a measure not included in TPB. Researchers focusing on the cognitive processes that mediate behavioral intentions have applied Protection Motivation Theory. PMT suggests that the adoption of a health-protective behavior depends two appraisal processes involving perceptions of the severity of the threat, probability of the threat occurring, efficacy of the recommended protective behavior, and self-efficacy.

The literature shows that PMT components have varying degrees of influence on behavioral intentions. Threat appraisals tend to have small effects on intentions, while coping appraisals generally show medium to large effect sizes. The majority of prior PMT studies examined each component separately, few studies have examined the measures of PMT as overall indices of threat appraisals and coping appraisals.

While PMT does not include measures of negative affect and information acceptance, the literature shows relationships between these variables and the components of PMT. Specifically, negative affect and risk perceptions have been shown to have a positive relationship. Self-

efficacy has been shown to be related to information acceptance; when self-efficacy is low, ratings of message acceptance tend to also be low. These relationships may be notable as negative affect and information acceptance have been found to be associated with behavioral intentions.

The literature shows that emphasizing either the benefits or costs associated with a particular behavior can alter a message's persuasive influence. However, the literature is inconsistent in regards to when frames are more persuasive. Previously, the literature focused on the distinction between prevention and detection behaviors as a possible explanation for the effects of gain- versus loss-framed information; however, recent meta-analyses show that this may not be the case (O'Keefe and Jensen, 2006; Gallagher and Updegraff, 2012). Latimer and colleagues (2012) instead suggest that the degree of variability in how individuals perceive the risks associated with a specific behavior may explain the effects of message framing.

To explain the inconsistent findings surrounding framing effects, the literature has begun to focus on identifying possible moderating variables of message framing effects (Van't Riet, 2009). Prior studies identify a number of possible moderators of message framing. Specifically, empirical studies have shown positive relationships between message framing and:

- 1) risk perceptions,
- 2) response efficacy,
- 3) self-efficacy, and
- 4) negative affect.

This study seeks to add to the literature on message framing and breastfeeding intentions in a number of ways. Previously, Protection Motivation Theory has not been applied to breastfeeding intentions; the literature on breastfeeding intentions has traditionally employed the Theory of Planned Behavior. Prior research shows that self-efficacy, as well as the benefits and costs of breastfeeding have been shown to influence breastfeeding intentions. However, the relationship between threat appraisals and breastfeeding intentions has not been investigated. In addition, the effects of message framing have not previously been tested on breastfeeding intentions.

Theoretical Framework

The theoretical basis for this study is grounded in a number of considerations. This study uses the PMT model proposed by Rogers (1975), which is depicted in Figure 1, as the main

theoretical framework to understand the relationships between the proposed variables. As the PMT model does not include measures of both information acceptance and negative affect, the present study will enhance the model by integrating both variables. Furthermore, this study will examine the influence of gain- and loss-framed messages on the model (Figure 2).

Specifically, the current study explores the background predictors of message frame, risk perception (threat appraisal), coping appraisal, feelings of worry, and information acceptance and subsequently their impact on behavioral intentions to breastfeed. In summary, the main changes from the initial model (Rogers, 1975) apply to (1) the inclusion of information acceptance and negative affect as intervening variables, (2) the application of the model for both gain and loss-framed messages, and (3) changing protection motivation from a predictor variable to the outcome variable.

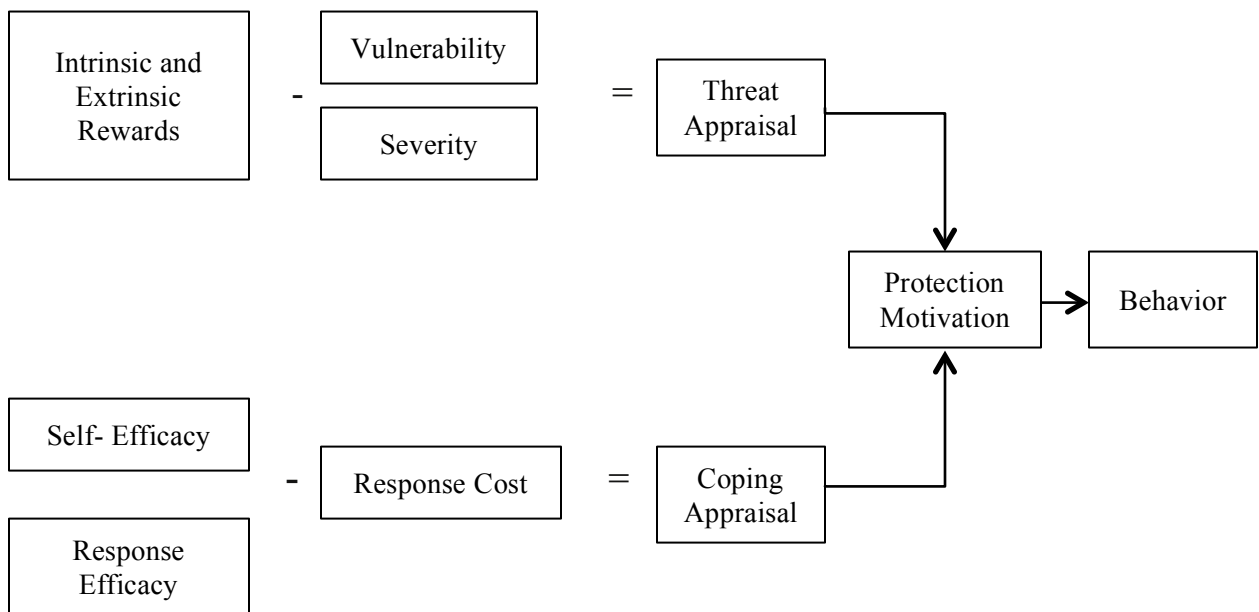


Figure 1. A baseline model of Protection Motivation Theory (Rogers, 1975)

Research Design and Hypotheses

When designing communications to promote healthy behaviors, health professionals must identify critical beliefs underlying a person’s intention to perform (or not perform) a given behavior. Theories of behavioral prediction provide a way to identify these beliefs. However,

behavioral theories do not provide direction on how to best design messages so that they will be attended to, accepted, and yielded to. Therefore, health professionals must also understand what makes a message effective, more specifically, the factors that influence acceptance and yielding.

One approach to understanding factors that enhance message effectiveness has been to focus on the way in which a message is framed (see, e.g., Rothman, Bartels, Wlaschin, & Salovey, 2006; Rothman, Martino, Bedell, Detweiler, & Salovey, 2003; Salovey, 2005; Schneider et al., 2001). However, evidence is still uncertain regarding under which circumstances gain and loss-framed messages are most persuasive.

This study aims to investigate under which circumstances gain- or loss-framed messages promoting breastfeeding are more persuasive. This study seeks to identify conditions that maximize the desired impact of framed messages on people's intentions to partake in a health-related behavior and to better understand how people's behavioral decisions are related to risk perceptions, self-efficacy, perceived benefits and costs of the targeted behavior, negative affect, and information acceptance. The hypotheses guiding this study are as follows (controlling for race and breastfeeding experience):

Based on prior research there are reasons to believe that individual's perceptions of risks (threats) associated with breastfeeding can be influenced by both information concerning what can be gained (threats reduced) by breastfeeding and what losses (threats increased) can result from not breastfeeding. In addition, there is reason to believe that information emphasizing the losses associated with by breastfeeding will have a greater influence on individual's perceptions of breastfeeding risks (threat appraisals).

H1: Compared to neutral information messages about breastfeeding, loss-framed and gain-framed messages are positively related to threat appraisals of outcomes associated with breastfeeding.

H1a: Compared to the relationship between gain-framed messages and threat appraisal, the positive relationship between loss-framed messages and threat appraisal will be stronger.

Previous studies show a link between message frame and evaluations of the behavior (response efficacy and cost) as well as one's perceived behavioral control (self-efficacy). Additionally, there is reason to believe that information emphasizing the gains associated with breastfeeding

will have a greater influence on an individual's perceptions of breastfeeding efficacy and costs (coping appraisals).

H2: Compared to neutral information messages about breastfeeding, loss-framed and gain-framed messages are positively related to coping appraisals of outcomes associated with breastfeeding.

H2a: Compared to the relationship between loss-framed messages and coping appraisal, the positive relationship between gain-framed messages and coping appraisal will be stronger.

Extending and extrapolating the research on messaging framing, perceived risk and self-efficacy in relation to negative affect and information acceptance, it is further hypothesized that:

Earlier studies show that emphasizing either the gains or losses associated with a behavior can influence an individual's negative affect (level of worry). Focusing on the losses, or increased threats, of not breastfeeding may have greater influence on negative affect than focusing on reduced threats, or gains.

H3: Compared to neutral information messages about breastfeeding, loss-framed and gain-framed messages are positively related to perceptions of negative affect associated with breastfeeding.

H3a: Compared to the relationship between gain-framed messages and threat appraisal, the positive relationship between loss-framed messages and threat appraisal will be stronger.

The literature shows that increased perceived severity and vulnerability (threat) is associated with increased negative affect, or worry.

H4: Threat Appraisals concerning the outcomes of breastfeeding are positively related to perceptions of negative affect associated with breastfeeding.

Prior research suggests that higher levels of perceived response efficacy and an individual's ability to perform the behavior (self-efficacy), combined with lower levels of perceived response costs, are associated with lower negative affect (levels of worry).

H5: Coping Appraisals concerning the outcomes of breastfeeding are negatively related to perceptions of negative affect associated with breastfeeding.

Similarly, higher levels of perceived self-efficacy and breastfeeding efficacy combined with lower levels of perceived costs, will likely result in increased information acceptance.

H6: Coping Appraisals concerning the outcomes of breastfeeding are positively related to acceptance of information associated with breastfeeding.

Previous studies have shown that extreme levels of negative affect can result in maladaptive coping responses such as information avoidance, or decreased levels of information acceptance.

H7: Perceptions of negative affect concerning the outcomes of breastfeeding are negatively related to acceptance of information associated with breastfeeding.

Earlier research shows that increased perceived severity and vulnerability (threat) will generally result in increased motivation to adopt a protective behavior.

H8: Threat Appraisals concerning the outcomes of breastfeeding are positively related to Protection Motivation (behavioral intentions to breastfeed).

Based on the literature, there is reason to believe that the greater the acceptance of the persuasive message, the greater the behavioral intention. Conversely, lower levels of message acceptance will likely result in lower levels of behavioral intention.

H9: Information Acceptance concerning the outcomes of breastfeeding is positively related to Protection Motivation (behavioral intentions to breastfeed).

Prior research shows that higher levels of self-efficacy and response efficacy, combined with lower levels of response cost (coping appraisal) will generally result in increased motivation to adopt a protective behavior.

H10: Coping Appraisals concerning the outcomes of breastfeeding are positively related to Protection Motivation (behavioral intentions to breastfeed).

Figure 2 summarizes the proposed hypotheses.

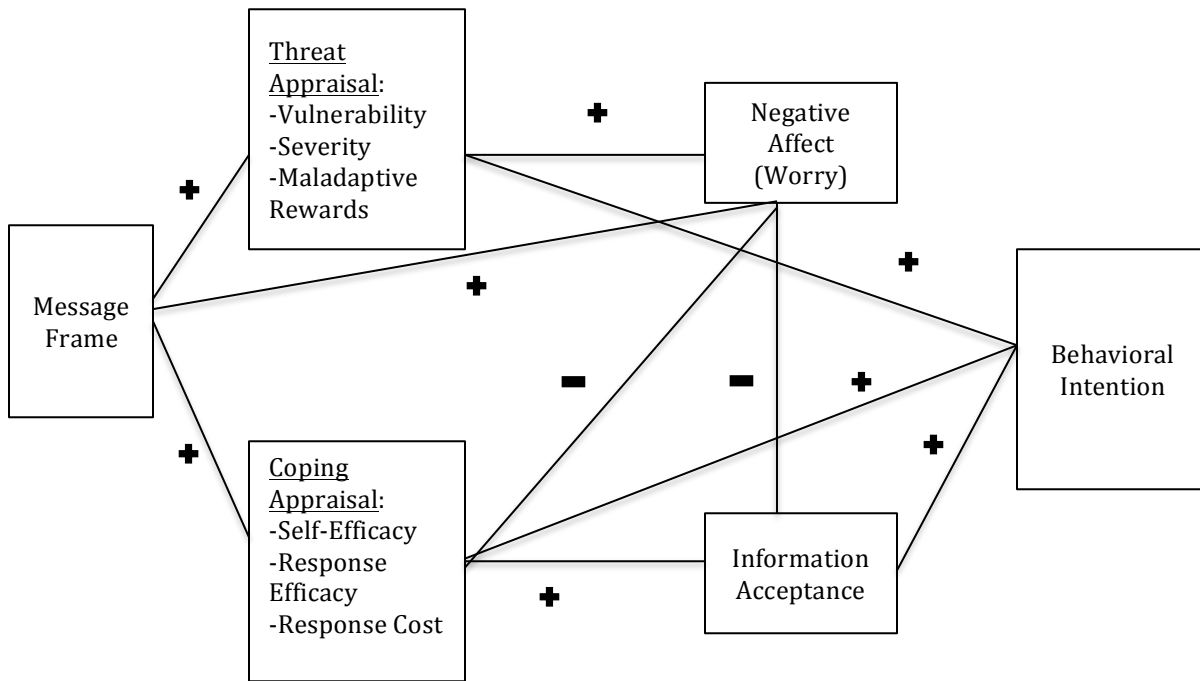


Figure 2. The proposed message-frame PMT model, controlling for race and breastfeeding experience.

CHAPTER 3

METHODOLOGY

This chapter outlines the methodology applied in the study. An overview of the particular methodology used is presented first. The chapter initially discusses the survey research design, the data collection procedures, and the sample. This chapter concludes with a description of the data analysis techniques utilized in the study.

Design

This study used a survey with a field-experimental manipulation to test the effects of message framing on intentions to breastfeed. Experimental research designs involve the manipulation of the independent variable(s). Traditionally, there are two forms of experiments: the laboratory experiment and the field experiment. A field experiment is any experiment that is carried out beyond the laboratory; that is, the experiment is performed in a “natural setting.”

There are a number of advantages and disadvantages of conducting field-experimental research via the Internet. Advantages include greater time efficiency, reduced costs, a reduction in data entry errors, heightened anonymity, and greater convenience for respondents in terms of the time and place of participation. Additionally, participants of field experiments are presumably not as influenced by the observation of the experimenter. (Lewis, Watson, & White, 2009)

The main disadvantage associated with field-experimental research is the loss of control over testing conditions. The experimenter is unable to control possible distractions provided by the environment or whether other people are present while the survey is being completed. An additional disadvantage is that the experimenter is unable to verify if the participants are accurately reporting information such as demographic information. (Lewis, Watson, & White, 2009)

This study consisted of three short communications: 1) a neutral message focusing on the infant feeding methods in general, 2) a message stressing the positive consequences of breastfeeding (gain-framed), and 3) a message stressing the negative consequences of not

breastfeeding (loss- framed). The Florida Sate University Institutional Review Board (IRB) approval form can be found in Appendix B.

The neutral, gain-, and loss-framed messages used in this study were the following:

Neutral message

Dear participant,

Motherhood is filled with both joys and challenges. Many of the experiences of becoming a first time parent are new experiences surrounded by uncertainty. New mothers face uncertainty with respect to how best to take care of the baby. There are so many decisions to make for your new baby regarding prenatal care, the birth of your child, diapering, immunizations, pediatricians, baby gear, and more.

One big decision a mother must make is how she will feed her infant. The decision to breastfeed or formula feed is a very personal one and is often influenced by many factors. A new mother may consider nutritional value, cost, and convenience, among other things.

Of course, expectant mothers are concerned with how best to protect their child from illness and disease, such as ear infections, diarrhea, diabetes and obesity. When deciding how to feed her child, a new mother may consider what is best for the child's health and nutrition. Breast milk and formula differ in nutritional composition, are digested differently, and differ in protection of an infant's health.

In addition to worrying about the infant's health, new parents worry about finances. New mothers must consider potential costs associated with infant feeding. While breastfeeding is free, some mothers may need to consider the cost of a breast pump and bottles. With formula feeding, the mother will have to consider costs associated with the formula and bottles. Depending on the type of formula –powdered, concentrated, ready-to-feed, or specialty (i.e. soy or hypoallergenic)—costs will vary.

Additional concerns will center on challenges regarding time and convenience. Challenges with formula include preparation of the formula, which involves measuring formula, mixing with water or milk, sterilizing nipples, refrigeration, and warming of bottles. Breastfeeding challenges may include nursing making it hard for new mothers to work, run errands, or travel because of the frequency of feedings or the need to pump during the day.

As mentioned, this decision is an important one that involves the consideration of many factors. Ultimately, a mother's decision will have to be based on what is best for her and her child.

Gain-framed message

Dear participant,

The method of infant feeding is one of the most important decisions a mother will make. Choosing to breastfeed increases an infant's protection from many diseases and illnesses. In addition, breastfeeding reduces maternal health risks and financial and environmental costs.

Outcomes for child

Current research indicates that breastfeeding is associated with a decrease in an infant's risk of experiencing recurrent ear infections and diarrhea. When an infant is breastfed, their chances of contracting lower-respiratory infections and asthma decrease. Risk of childhood obesity and Type-2 diabetes also decreases. Research has also shown that breastfeeding lowers the risk of unexpected, sudden death of an infant, otherwise known as Sudden Infant Death Syndrome (SIDS).

Breastfeeding not only provides nourishment for the infant, but also provides comfort and security. Breastfeeding soothes an infant when they are lonely, frightened or in pain.

Furthermore, breastfeeding protects against potential allergies sometimes associated with infant formula and the various types of milk mixed with formula. Infants that are exclusively breastfed for a minimum of 4 months are also found to have fewer food allergies.

Outcomes for mother

Recent studies indicate that for mothers, breastfeeding is associated with lower risk of breast and ovarian cancer. Breastfeeding is also associated with lower risk of Type-2 diabetes. Mothers that breastfed can experience increased weight loss as they tend to burn up to an average of 500 extra calories a day producing breast milk. Breastfeeding releases the hormone oxytocin, a hormone that helps the uterus return to its pre-pregnancy size and may reduce uterine bleeding after birth. The increased levels of oxytocin production found in breastfeeding mothers is also associated with lower reported levels of stress and negative moods. Findings also show that breastfeeding also increases maternal and infant bonding when compared to formula feeding.

In addition, breastfeeding eliminates the nearly \$1,500 per year costs associated with formula and feeding. Breastfeeding does not involve measuring formula, mixing with water or milk, sterilizing nipples, or warming bottles, requiring less time than formula feeding.

Economical & Environmental Outcomes

Current estimates indicate that increased rates of breastfeeding could save \$13 billion per year in the United States. Medical care costs are lower for fully breastfed infants than never-breastfed infants. In addition, breastfed infants typically need fewer sick care visits, prescriptions, and hospitalizations.

Furthermore, breastfeeding is also better for the environment. There is less trash and plastic waste compared to that produced by formula cans and bottle supplies.

Loss-framed message

Dear participant,

The method of infant feeding is one of the most important decisions a mother will make. Choosing not to breastfeed lowers an infant's protection from many diseases and illnesses. In addition, not breastfeeding increases maternal health risks and financial and environmental costs.

Outcomes for child

Current research indicates that not breastfeeding is associated with an increase in an infant's risk of experiencing recurrent ear infections and diarrhea. When an infant is not breastfed, their chances of contracting lower-respiratory infections and asthma increase. Risk of childhood obesity and Type-2 diabetes also increases. Research has also shown that not breastfeeding increases the risk of unexpected, sudden death of an infant, otherwise known as Sudden Infant Death Syndrome (SIDS).

While formula feeding provides nourishment for the infant, it does not provide the same type of comfort and security as breastfeeding. In particular, formula does not soothe an infant when they are lonely, frightened or in pain.

Furthermore, formula feeding involves risk of potential allergies to ingredients in the formula or the type of milk mixed with the formula. Infants that are not breastfed are found to have more food allergies.

Outcomes for mother

Recent studies indicate that for mothers, not breastfeeding is associated with higher risk of breast and ovarian cancer. Not breastfeeding is also associated with higher risk of Type-2 diabetes. Mothers that do not breastfeed do not experience the increased weight loss that comes with burning extra calories when producing breast milk. Not breastfeeding inhibits the release of the hormone oxytocin, a hormone that helps the uterus return to its pre-pregnancy size and reduce uterine bleeding after birth. The lower levels of oxytocin production found in mothers that do not breastfeed is also associated with higher reported levels of stress and negative moods. Findings also show that not breastfeeding has been found to be associated with lower levels of maternal and infant bonding when compared to breastfeeding.

In addition, formula and feeding supplies can cost nearly \$1,500 each year. Formula feeding involves measuring formula, mixing with water or milk, sterilizing nipples, and warming bottles, requiring more time than breastfeeding.

Economical & Environmental Outcomes

Current estimates indicate that lower rates of breastfeeding could cost \$13 billion per year

in the United States. Medical care costs are higher for never-breastfed infants than fully breastfed infants. In addition, infants that are not breastfed typically need more sick care visits, prescriptions, and hospitalizations.

Furthermore, not breastfeeding also has environmental costs. Formula cans and bottle supplies create more trash and plastic waste.

Data Collection Procedures

The survey instrument was developed as a web-based survey using Qualtrics online survey software. The online survey system randomly assigned participants to one of the stimulus conditions. The advantage of using an online survey for this study is that it allows for the collection of a large amount of data from a variety of people at one time and can be administered free of geographic confines.

The online version of the questionnaire was pretested with a small sample of potential subjects (n=30). Analyses of these results showed that the messages were not fully interpreted as intended. Additional feedback from respondents' indicated that the order of the scales was not consistent throughout the survey. Based upon the pilot study responses, minor changes were made to the survey to reflect a consistency in the direction of scales and the wording used in the stimulus messages was changed to strengthen the manipulation of the frames and to insure the messages were presenting the arguments as intended.

Sample and Sampling Issues

A convenience sample was used in this study. Female students at Florida State University were invited to participate in an online survey. Participants were invited to participate based on criteria chosen to maximize relevance of the message content: gender (female) and age (23-40).

Lack of access to student email addresses presented a challenge for this study. In lieu of emailing students directly, the chairs of departments at Florida State University were each contacted with a request to forward the recruitment email and web link to their students inviting them to visit the site to complete the survey.

The heads of fifty departments/schools or colleges (in the case that there were no departments) were contacted. Of those, 17 positive responses and one negative response were received. With a total of 15 colleges or schools, ten forwarded the recruitment email to their

students in at least one of their departments: Arts & Sciences, Communication & Information, Criminology & Criminal Justice, Education, Engineering, Human Sciences, Medicine, Social Sciences & Public Policy, Social Work, and Visual Arts, Theatre, and Dance. Without a response indicating the recruitment email would be forwarded, it cannot be determined whether students in the following colleges received the recruitment email: Business, Law, Motion Picture Arts, Music, and Nursing.

With the recruitment email being sent at the discretion of departments chairs, a sample could not be drawn from the entire female population at Florida State University, which means that each female student between the ages of 23-40 did not have the equal opportunity to participate in this study. This limitation on the population from which the sample could be drawn has possible implications on the results of the study. One result may be that the final sample does not accurately represent the desired sample.

Students were informed that their participation in the survey was voluntary. Those willing to participate were first asked to read an IRB-approved informed consent form and asked to list the risks and benefits of participating in this study as they understood them. The informed consent form can be found in Appendix C.

The data collection window was open between April 23 to May 9, 2013. In this time, 280 participants started the survey. One case was excluded because the respondent was not within the stipulated age range. Additionally, 38.3% of respondents reported having children ($n = 75$). Among the respondents with children, 96.0% ($n = 72$) reported having breastfed one of their children or were currently breastfeeding. As this study seeks to examine breastfeeding intentions among women who had not previously breastfed, these 75 cases were excluded from the analyses.

The final sample included 185 participants. Of those, 61 were assigned to the neutral message unit, 60 to the gain-frame message unit, and 64 to the loss-frame message unit. However, due to participant drop out, sample size varied for each question and therefore both final sample size and the number of missing cases are reported when necessary.

Measures

Eight indices were created to capture threat appraisal components, coping appraisal components, negative affect, information acceptance, and breastfeeding intentions. A total of

fifty-four items were combined into the eight indices. Following factor analysis with Varimax rotation, the items with the highest factor loadings were summed to create indices. Table 1 summarizes the indices indicating the number of items used and the Cronbach alpha reliability coefficients for each index. All indices had reliabilities above .8 and were considered acceptable for applied research (Nunnally, 1967; Pedhazur and Schmelkin, 1991).

The details associated with the eight indices can be summarized as follows (see Table 1):

Measures of Threat Appraisal

Vulnerability. (alpha = 0.884) Perceptions of vulnerability were measured by averaging the scores of five items regarding the likelihood of a child experiencing ear infections/diarrhea/asthma/obesity/SIDS if they were not breastfed. Items were measured on a 7-point scale ranging from 1 (very unlikely) to 7 (very likely). Responses to the vulnerability items were coded such that a high score indicated high perceived vulnerability.

Severity. (alpha = 0.866) Perceived severity was measured by averaging the scores of four items regarding the seriousness of a child experiencing ear infections/diarrhea/asthma/obesity/SID. Items were measured on a 5-point scale ranging from 1 (not at all serious) to 5 (very serious).

Maladaptive Intrinsic and Extrinsic Rewards (of formula feeding). (alpha = 0.813) Perceived intrinsic and extrinsic rewards associated with not breastfeeding were measured by seven items such as “I feel more comfortable with formula feeding than breastfeeding.” Items were measured on a 7-point scale (1= *strongly disagree*, 7 = *strongly agree*). Responses to the maladaptive rewards items were reverse-scored.

To create an overall index of threat appraisal, vulnerability and severity were multiplied, and then maladaptive rewards was subtracted from that product.

Measures of Coping Appraisal

Self-efficacy. (alpha = 0.928) To measure self-efficacy, a modified version of the Breastfeeding Self-Efficacy Scale developed by Dennis and Faux (1999) was used. Respondents were asked to rate their level of confidence regarding thirteen statements such as “I can successfully cope with breastfeeding like other challenges.” Items were measured on a 7-point scale (1= *not at all confident*, 5 = *very confident*). Responses to the self-efficacy items were coded such that a high score indicated high self-efficacy.

Response Efficacy. (alpha = 0.899) Perceived response efficacy was measured by six items regarding benefits of breastfeeding (i.e. Breastfeeding can help keep your baby safe from the above diseases and illnesses). Items were measured on a 7-point scale (1= *strongly disagree*, 7 = *strongly agree*). Responses to the response efficacy terms were coded such that a high score indicated high perceived breastfeeding efficacy.

Response Costs. (alpha = 0.802) The perceived behavioral costs of breastfeeding were measured by five items on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items included: breastfeeding is inconvenient/ embarrassing/ hard. Responses to the response cost items were reverse-scored.

To create an overall index of coping appraisal, self-efficacy and response efficacy were summed, and then response cost was subtracted from that total.

Mediators

Negative affect. (alpha = 0.902) Five items were used to measure individuals’ levels of worry regarding the health risks associated with not breastfeeding (i.e. How worried or concerned are you that your child will experience ear infections/ diarrhea/ asthma/ obesity/ SIDS?). Participants were asked to rate their level of worry on a 5-point scale (1 = *not at all concerned*, 5 = *extremely concerned*). Responses to the negative affect items were coded such that a high score indicated high negative affect.

Information acceptance. (alpha = 0.919) Participants were asked to indicate their agreement or disagreement with statements regarding the message they received at the beginning of the survey (i.e. The information was relevant / interesting / true / convincing / believable / useful). Items were measured on a 7-point scale (1 = *Strongly disagree*; 7 = *Strongly agree*). Responses to the information acceptance items were coded such that a high score indicated acceptance.

Measure of Protection Motivation

Intention. (alpha = 0.893) Intention to breastfeed was measured by summing the scores of three items: ‘Thinking about the future, how likely is it that you’ll breastfed,’ ‘I plan to exclusively breastfeed for at least 3 months’, and ‘I intend to breastfeed my child for at least 6 months’. Items used 7-point scales. Responses to the intention items were coded such that a high score indicated high behavioral intentions.

In addition, participants were asked a series of questions concerning their demographic characteristics that have been shown to be associated with breastfeeding intentions (age, race/ethnicity, degree, marital status) and their experience with breastfeeding (were they breastfed, have they observed successful breastfeeding among close friends and family, have close others shared the benefits of breastfeeding with them). Responses to the three items measuring breastfeeding experience were summed to create a breastfeeding experience index. Race and breastfeeding experience were employed as control variables in the data analyses, while the other demographic variables showed no significant relationship with the predicted variables.

Table 1. Summed Unstandardized Indices and Cronbach's Alpha Reliabilities

Indices	Sample (n)	Number of Items	Alpha Reliability Coefficients
Threat Appraisal Indices			
Vulnerability	137	5	0.884
Severity	138	4	0.866
Intrinsic and Extrinsic Rewards	123	7	0.813
Coping Appraisal Indices			
Response Efficacy	122	6	0.899
Response Cost	120	5	0.802
Self-Efficacy	119	13	0.928
Negative Affect	130	5	0.902
Information Acceptance	120	6	0.919
Breastfeeding Intentions	120	3	0.893

Statistical Procedures

SPSS (version 21.0) was used to perform the data analyses in this study. The data was analyzed primarily to determine the extent to which the proposed message-frame PMT model predicts behavioral intentions to breastfeed. Multiple regression analyses were used to test the hypothesized relationships among the variables in the model. Previous studies have used multiple regression analyses to investigate the application of Protection Motivation Theory in risk communication (i.e. Neuwirth, Dunwoody, & Griffin, 2000). Prior studies have also used multiple regression to examine the effects of message framing on behavioral intentions (i.e. Sherman, Mann, & Updegraff, 2006).

The regression model allows for a predictor variable's effect on the predicted variable to be evaluated controlling for the remaining predictor variables. Multiple regression analysis involves the use of regression coefficients as indices of the effects of predictor variables upon predicted variables. The regression coefficient indicates the expected change in the predicted variable associated with a unit change in a given predictor variable controlling for the other predictor variables.

The coefficient of determination, R^2 , is used to evaluate model fit. R^2 is equal to 1 minus the ratio of the residual variability. R^2 provides the amount of variability in the dependent

variable accounted for by the variables included in the model. An R^2 close to 1.0 indicates that almost all the variability is accounted for by the variables specified in the model. The degree to which two or more predictor variables are related to the predicted variable is expressed in the correlation coefficient R , which is the square root of R^2 . R can range from 0 to 1.

Multiple regression analyses rely upon certain assumptions being met. Assumptions of multiple regression include: 1) independence of observations; 2) normal distribution of variables; 3) linearity; and 4) homoscedasticity. Regression assumes that variables have normal distributions. Non-normally distributed variables (highly skewed or kurtotic variables, or variables with substantial outliers) can distort relationships and significance tests. To ensure this assumption was met, inspections of data plots, skew, kurtosis, and frequency distributions were conducted.

Multiple regression can most accurately estimate the relationship between predicted and predictor variables if the relationships are linear in nature. If the relationship is not linear, the results will under-estimate the true relationship, which can increase the chance of Type II error. Multiple regression also assumes homoscedasticity, meaning the variance of errors is the same across all levels of the predictor variable. When this assumption is not met, it can lead to a distortion of findings and increase the possibility of Type I error. To detect possible non-linearity and heteroscedasticity, residual plots were examined.

To include the categorical message group variable containing three groups (loss, gain, and neutral) in the multiple regression analyses, the categorical variable had to be recoded into two separate dummy variables (coded as 0 and 1), one for the loss-frame message group and one for the gain-frame message group.

CHAPTER 4

RESULTS

This chapter presents a summary of the findings of this study. First, a description of the sample respondents is provided. Then, the research hypotheses are restated and addressed using the results of the multiple regression analyses.

Descriptive Analysis

Table 2 provides a demographic description of the respondents. Information is provided for the full sample and each of the three message groups. In addition, it also includes descriptive analyses of respondents' breastfeeding experience.

The mean age of the full sample is 27.8 (SD = 4.47) years old. The majority of respondents are Caucasian (82.9%) and not Hispanic (95.7%). Most of the respondents are single (68.6%) and are either working on or already completed an undergraduate (10.3%) or graduate degree (83.7%). A large majority of respondents reported being breastfed as an infant (64.5%), observed breastfeeding of close others (84.2%), and have had close others share the benefits of breastfeeding with them (73.3%).

Table 2. Sample Respondents' Demographic Characteristics and Breastfeeding Experience

	Total Sample	Neutral Group	Gain Group	Loss Group
Demographic Characteristics				
<u>Age</u>				
Mean	27.80	28.03	28.08	27.36
Std. Deviation	4.47	4.57	4.54	4.40
Mode	27	27	27	23
Minimum	23	23	23	23
Maximum	42	39	39	42
	n = 117	n = 39	n = 36	n = 42
	Missing = 87 (42.6%)	Missing = 22 (36.1%)	Missing = 24 (40.0%)	Missing = 22 (34.4%)

Table 2 cont'd. Sample Respondents' Demographic Characteristics and Breastfeeding Experience

	Total Sample	Neutral Group	Gain Group	Loss Group
<u>Race</u>				
African	6.0%	7.7%	2.8%	7.1%
White	82.9%	79.5%	83.3%	85.7%
Asian	1.7%	2.6%	2.8%	0
Other	9.4%	10.3%	11.1%	7.1%
	n = 117	n = 39	n = 36	n = 42
	Missing = 87 (42.6%)	Missing = 22 (36.1%)	Missing = 24 (40.0%)	Missing = 22 (34.4%)
<u>Hispanic or Latina</u>				
Yes	4.3%	2.6%	2.9%	7.1%
No	95.7%	97.4%	97.1%	92.9%
	n = 116	n = 39	n = 35	n = 42
	Missing = 88 (43.1%)	Missing = 22 (36.1%)	Missing = 25 (41.7%)	Missing = 22 (34.4%)
<u>Marital Status</u>				
Single	68.6%	64.1%	67.6%	73.8%
Married	28.0%	35.9%	29.7%	19.0%
Divorced	3.4%	0	2.7%	7.1%
	n = 118	n = 39	n = 37	n = 42
	Missing = 88 (43.1%)	Missing = 22 (36.1%)	Missing = 23 (38.3%)	Missing = 22 (34.4%)
<u>Degree</u>				
Undergraduate	10.3%	13.2%	8.1%	9.5%
Graduate, Law, Medicine	83.7%	84.2%	78.4%	88.1%
None	6.0%	2.6%	13.5%	2.4%
	n = 117	n = 38	n = 37	n = 42
	Missing = 87 (42.6%)	Missing = 23 (37.7%)	Missing = 23 (38.3%)	Missing = 22 (34.4%)

Table 2 cont'd. Sample Respondents' Demographic Characteristics and Breastfeeding Experience

	Total Sample	Neutral Group	Gain Group	Loss Group
<u>Breastfed as infant</u>				
Yes	64.5%	65.9%	57.9%	69.0%
No	23.1%	24.4%	26.3%	19.0%
Don't know	12.4%	9.8%	15.8%	11.9%
	n = 121	n = 41	n = 38	n = 42
	Missing = 83 (40.7%)	Missing = 20 (32.8%)	Missing = 22 (36.7%)	Missing = 22 (34.4%)
<u>Observed Breastfeeding of close others</u>				
Yes	84.2%	87.8%	78.4%	85.7%
No	15.8%	12.2%	21.6%	14.3%
	n = 120	n = 41	n = 37	n = 42
	Missing = 84 (41.2%)	Missing = 20 (32.8%)	Missing = 23 (38.3%)	Missing = 22 (34.4%)
<u>Close others have shared benefits of breastfeeding</u>				
Yes	73.3%	63.4%	81.1%	76.2%
No	26.7%	36.6%	18.9%	23.8%
	n = 120	n = 41	n = 37	n = 42
	Missing = 84 (41.2%)	Missing = 20 (32.8%)	Missing = 23 (38.3%)	Missing = 22 (34.4%)

Table 3 provides a summary of respondents' responses to the measures used to create the index of breastfeeding intentions. Information is provided for the full sample and each of the three message groups.

The majority of respondents indicated that they were very likely to breastfeed (57.5%). For the neutral message group, 48.8% of respondents reported they were very likely to breastfeed, while 64.9% of gain-frame and 59.5% of loss-frame respondents did. With regards to plans to breastfeed for at least 6 months, 35.8% of the total sample indicated they planned to; 34.1% of the neutral group, 43.2% of the gain-frame group and 31.0% of the loss-frame group indicated they had planned to breastfeed for at least 6 months. When asked if they planned to exclusively breastfeed for at least 3 months, 39.2% of the total sample said they did. By group, 43.9% of neutral group respondents, 37.8% of gain-frame respondents, and 35.7% of loss-frame respondents reported that they planned to exclusively breastfeed for at least 3 months.

Table 3. Sample Respondents' Breastfeeding Intentions

	Total Sample	Neutral Group	Gain Group	Loss Group
<u>How likely is it that you'll breastfeed?</u>				
Very Unlikely	7.5%	7.3%	2.7%	11.9%
Unlikely	1.7%	0	2.7%	2.4%
Somewhat Unlikely	0	0	0	0
Undecided	5.0%	9.8%	2.7%	2.4%
Somewhat Likely	8.3%	9.8%	5.4%	9.5%
Likely	20.0%	24.4%	21.6%	14.3%
Very Likely	57.5%	48.8%	64.9%	59.5%
	n = 120	n = 41	n = 37	n = 42
	Missing = 84 (41.2%)	Missing = 20 (32.8%)	Missing = 23 (48.3%)	Missing = 22 (34.4%)
<u>Plan to breastfeed for at least 6 months.</u>				
Strongly Disagree	3.3%	0	5.4%	4.8%
Disagree	1.7%	0	0	4.8%
Somewhat Disagree	5.0%	2.4%	8.1%	4.8%
Neither Agree or Disagree	10.8%	22.0%	2.7%	7.1%
Somewhat Agree	22.5%	29.3%	21.6%	16.7%
Agree	20.8%	12.2%	18.9%	31.0%
Strongly Agree	35.8%	34.1%	43.2%	31.0%
	n = 120	n = 41	n = 35	n = 42
	Missing = 84 (41.2%)	Missing = 20 (32.8%)	Missing = 25 (41.7%)	Missing = 22 (34.4%)
<u>Plan to exclusively breastfeed for at least 3 months.</u>				
Strongly Disagree	2.5%	0	2.7%	4.8%
Disagree	0.8%	0	0	2.4%
Somewhat Disagree	2.5%	0	5.4%	2.4%
Neither Agree or Disagree	10.8%	17.1%	8.1%	7.1%
Somewhat Agree	20.0%	24.4%	16.2%	19.0%
Agree	24.2%	14.6%	29.7%	28.6%
Strongly Agree	39.2%	43.9%	37.8%	35.7%
	n = 120	n = 41	n = 37	n = 42
	Missing = 84 (41.2%)	Missing = 20 (32.8%)	Missing = 23 (38.3%)	Missing = 22 (34.4%)

Test of Hypotheses

H1: Compared to neutral information messages about breastfeeding, loss-framed and gain-framed messages are positively related to threat appraisals of outcomes associated with breastfeeding.

H1a: Compared to the relationship between gain-framed messages and threat appraisal, the positive relationship between loss-framed messages and threat appraisal will be stronger.

The first hypothesis proposes a positive relationship between message frame and threat appraisal. In addition, loss-framed messages would have a stronger positive relationship with threat appraisals as compared to gain-framed messages. The multiple regression model with race and breastfeeding experience as control variables and message frame as the predictor explained 10.0% of the variance in threat appraisal ($R^2 = .100$, $F(4,113) = 4.136$, $p = .004$).

As can be seen in Table 4, the loss-frame message significantly positively predicted threat appraisal ($\beta = .193$, $t(113) = 1.859$, $p = .033$), while the gain-frame message did not ($\beta = .077$, $t(113) = .741$, $p = .230$). Thus, H1 was partially supported. This finding confirms the results of previous studies showing a relationship between loss-framed messages and risk perceptions (Meyerowitz, Wilson, & Chaiken, 1991; Gallagher et al., 2011).

While H1a proposed a stronger relationship between loss-framed messages and threat appraisal as compared to gain-framed messages, this relationship was not supported by the multiple regression model. Unfortunately, the analyses did not support a comparison of the two relationships as the gain-framed message showed no significant relationship with threat appraisals.

Table 4. Multiple Regression Analyses, Using Loss-Framed Messages and Gain-Framed Messages to Predict Threat Appraisals of Outcomes Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences). Sample n = 114

Model Summary and Steps		R	R Square	Adjusted R Square	Std. Error of the Estimate	
Step 1: Entering Control Variables		.322	.104	.088	7.60971	
Step 2: Entering Control & Predictor Variables		.363	.132	.100	7.55870	
		Sum of Squares	df	Mean Square	F	Sig.
Step 1: Entering Control Variables	Regression	745.116	2	372.558	6.434	.002
	Residual	6427.756	111	57.908		
	Total	7172.873	113			
Step 2: Entering Control and Predictor Variables	Regression	945.276	4	236.319	4.136	.004
	Residual	6227.596	109	57.134		
	Total	7172.873	113			
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Step 1: Entering Control Variables	(Constant)	6.650	2.143		3.103	.002
	Race	2.942	1.912	.138	1.538	.127
	Breastfeeding Experience	2.933	.907	.290	3.233	.002
Step 2: Entering Control and Predictor Variables	(Constant)	5.390	2.317		2.326	.022
	Race	3.180	1.906	.149	1.668	.098
	Breastfeeding Experience	2.783	.905	.276	3.076	.003
	Loss-Framed Messages	3.184	1.713	.193	1.859	.033
	Gain-Framed Messages	1.316	1.776	.077	.741	.230

Notes:

- Race is a binary variable (0 = Caucasian, 1 = Minority)
- Constant and Control variable probabilities are two-tailed.
- Predictor variable probabilities are one-tailed.

H2: Compared to neutral information messages about breastfeeding, loss-framed and gain-framed messages are positively related to coping appraisals of outcomes associated with breastfeeding.

H2a: Compared to the relationship between loss-framed messages and coping appraisal, the positive relationship between gain-framed messages and coping appraisal will be stronger.

The second hypothesis proposes a positive relationship between message frame and coping appraisal. Additionally, hypothesis two proposed that the gain-frame message would have a stronger positive relationship with coping appraisals as compared to the loss-frame message. The multiple regression model with race and breastfeeding experience as control variables and message frame as the predictor explained 10.5% of the variance in coping appraisal ($R^2 = .105$, $F(4,114) = 4.361$, $p = .003$). The results presented in Table 5 show that neither loss-frame or gain-frame message significantly predicted coping appraisal. Thus, H2 was not supported.

H2a was also not supported as the relationships between coping appraisals and loss- and gain- framed could not be compared. No significant relationship was produced between message frame and coping appraisal.

Table 5. Multiple Regression Analyses, Using Loss-Framed Messages and Gain-Framed Messages to Predict Coping Appraisals of Outcomes Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences). Sample n = 115

Model Summary and Steps		R	R Square	Adjusted R Square	Std. Error of the Estimate	
Step 1: Entering Control Variables		.331	.110	.094	2.06871	
Step 2: Entering Control & Predictor Variables		.370	.137	.105	2.05522	
		Sum of Squares	df	Mean Square	F	Sig.
Step 1: Entering Control Variables	Regression	59.004	2	29.502	6.894	.002
	Residual	479.310	112	4.280		
	Total	538.314	114			
Step 2: Entering Control and Predictor Variables	Regression	73.681	4	18.420	4.361	.003
	Residual	464.633	110	4.224		
	Total	538.314	114			
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Step 1: Entering Control Variables	(Constant)	3.848	.583		6.602	.000
	Race	1.218	.509	.213	2.393	.018
	Breastfeeding Experience	.700	.246	.254	2.852	.005
Step 2: Entering Control and Predictor Variables	(Constant)	3.867	.630		6.138	.000
	Race	1.184	.507	.207	2.336	.021
	Breastfeeding Experience	.732	.245	.266	2.991	.003
	Loss-Framed Messages	-.529	.462	-.117	-1.144	.255
	Gain-Framed Messages	.343	.479	.073	.717	.475

Notes:

- Race is a binary variable (0 = Caucasian, 1 = Minority)
- Constant and Control variable probabilities are two-tailed.
- Predictor variable probabilities are one-tailed.

H3: Compared to neutral information messages about breastfeeding, loss-framed and gain-framed messages are positively related to perceptions of negative affect associated with breastfeeding.

H3a: Compared to the relationship between gain-framed messages and threat appraisal, the positive relationship between loss-framed messages and negative affect will be stronger.

H4: Threat Appraisals concerning the outcomes of breastfeeding are positively related to perceptions of negative affect associated with breastfeeding.

H5: Coping Appraisals concerning the outcomes of breastfeeding are negatively related to perceptions of negative affect associated with breastfeeding.

Hypotheses three through five propose a relationship between message frame, threat appraisal, coping appraisal and negative affect. H3 proposes a positive relationship between message frame and negative affect. H3a further proposes that the loss-frame message would have a stronger positive relationship with negative affect as compared to the gain-frame message. H4 suggests a positive relationship between threat appraisal and negative affect and H5 suggests a negative relationship between coping appraisal and negative affect.

The multiple regression model with race and breastfeeding experience as control variables and message frame, threat appraisal, and coping appraisal as the predictor explained 31.5% of the variance in negative affect ($R^2 = .315$, $F(6,109) = 9.368$, $p < .001$). The results presented in Table 6 show that neither loss-frame or gain-frame message significantly predicted negative affect. Thus, H3 was not supported. As there was no significant relationship between message frame and negative affect, there were no relationships to compare and therefore no support for H3a.

The results presented in Table 6 show that threat appraisal significantly positively predicted negative affect ($\beta = .545$, $t(109) = 5.936$, $p < .001$), thus, supporting H4. This mirrors the literature showing that worry is related to risk perceptions (Klein, 2003). However, coping appraisal did not significantly predict negative affect, hence, H5 was not supported.

Table 6. Multiple Regression Analyses, Using Loss-Framed Messages, Gain-Framed Messages, Threat Appraisals and Coping Appraisal to Predict Negative Affect Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences). Sample n = 110

Model Summary and Steps		R	R Square	Adjusted R Square	Std. Error of the Estimate	
Step 1: Entering Control Variables		.218	.048	.030	1.28299	
Step 2: Entering Control & Predictor Variables		.594	.353	.315	1.07777	
		Sum of Squares	df	Mean Square	F	Sig.
Step 1: Entering Control Variables	Regression	8.810	2	4.405	2.676	.073
	Residual	176.128	107	1.646		
	Total	184.939	109			
Step 2: Entering Control and Predictor Variables	Regression	65.294	6	10.882	9.368	.000
	Residual	119.645	103	1.162		
	Total	184.939	109			
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Step 1: Entering Control Variables	(Constant)	3.052	.364		8.393	.000
	Race	.673	.324	.196	2.079	.040
	Breastfeeding Experience	.153	.154	.094	0.992	.323
Step 2: Entering Control and Predictor Variables	(Constant)	2.185	.387		5.645	.000
	Race	.359	.280	.105	1.281	.203
	Breastfeeding Experience	-.135	.139	-.083	-0.972	.333
	Loss-Framed Messages	.019	.254	.007	.077	.939
	Gain-Framed Messages	.223	.256	.079	.869	.387
	Threat Appraisals	.090	.015	.545	5.936	.000
	Coping Appraisals	.047	.058	.075	.802	.425

Notes:

Race is a binary variable (0 = Caucasian, 1 = Minority)
 Constant and Control variable probabilities are two-tailed.
 Predictor variable probabilities are one-tailed.

H6: Coping Appraisals concerning the outcomes of breastfeeding are positively related to acceptance of information associated with breastfeeding.

H7: Perceptions of negative affect concerning the outcomes of breastfeeding are negatively related to acceptance of information associated with breastfeeding.

The sixth and seventh hypotheses propose that coping appraisal would have a positive relationship with information acceptance and negative affect would have a negative relationship with information acceptance. The multiple regression model with race and breastfeeding experience as control variables and coping appraisal and negative affect as predictors explained 35.8% of the variance in threat appraisal ($R^2 = .358$, $F(4,112) = 16.589$, $p < .001$). As can be seen in Table 7, coping appraisal ($\beta = .496$, $t(112) = 6.038$, $p < .001$) significantly positively predicted information acceptance. Thus, H6 was supported. However, H7 was not supported as the results were in the opposite direction as hypothesized. Table 7 shows that negative affect ($\beta = .305$, $t(112) = 3.858$, $p < .001$) has a significant positive relationship with information acceptance.

Table 7. Multiple Regression Analyses, Using Coping Appraisals and Negative Affect to Predict Information Acceptance Associated with Breastfeeding (Controlling for Race and Breastfeeding Experiences). Sample n = 113

Model Summary and Steps		R	R Square	Adjusted R Square	Std. Error of the Estimate	
Step 1: Entering Control Variables		.114	.013	-.005	.66857	
Step 2: Entering Control & Predictor Variables		.617	.381	.358	.53452	
		Sum of Squares	df	Mean Square	F	Sig.
Step 1: Entering Control Variables	Regression	.647	2	.323	.724	.487
	Residual	49.169	110	.447		
	Total	49.816	112			
Step 2: Entering Control and Predictor Variables	Regression	18.959	4	4.740	16.589	.000
	Residual	30.857	108	.286		
	Total	49.816	112			
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Step 1: Entering Control Variables	(Constant)	3.799	.189		20.107	.000
	Race	.161	.165	.092	.975	.332
	Breastfeeding Experience	3.799	.189	.067	.707	.481
Step 2: Entering Control and Predictor Variables	(Constant)	2.745	.205		13.411	.000
	Race	-.103	.136	-.059	-.762	.448
	Breastfeeding Experience	-.083	.066	-.099	-1.256	.212
	Coping Appraisals	.152	.025	.496	6.038	.000
	Negative Affect	.156	.040	.305	3.858	.000

Notes:

- Race is a binary variable (0 = Caucasian, 1 = Minority)
- Constant and Control variable probabilities are two-tailed.
- Predictor variable probabilities are one-tailed.

H8: Threat Appraisals concerning the outcomes of breastfeeding are positively related to Protection Motivation (behavioral intentions to breastfeed).

H9: Information Acceptance concerning the outcomes of breastfeeding is positively related to Protection Motivation (behavioral intentions to breastfeed).

H10: Coping Appraisals concerning the outcomes of breastfeeding are positively related to Protection Motivation (behavioral intentions to breastfeed).

Hypotheses eight, nine, and ten propose positive relationships between threat appraisals, information acceptance, coping appraisals and behavioral intentions. Due to an issue with multicollinearity (Table 8 shows correlations between variables), information acceptance was dropped from the model. The multiple regression model with race and breastfeeding experience as control variables and threat appraisal, and coping appraisal as predictors explained 43.0% of the variance in breastfeeding behavioral intentions ($R^2 = .430$, $F(4,111) = 21.895$, $p < .001$). As can be seen in Table 9, both coping appraisal ($\beta = .527$, $t(111) = 6.637$, $p < .001$) and threat appraisal ($\beta = .164$, $t(111) = 2.027$, $p = .045$) significantly positively predicted breastfeeding intentions. H8 and H10 were supported.

In a separate multiple regression model with race and breastfeeding experience as control variables and information acceptance as the predictor, 21.2% of the variance in breastfeeding behavioral intentions was explained ($R^2 = .212$, $F(3,116) = 11.382$, $p < .001$). As the results of the model show, in Table 10, information acceptance ($\beta = .361$, $t(116) = 4.351$, $p < .001$) significantly positively predicted breastfeeding intentions. Thus, H9 was supported.

	(1)	(2)	(3)	(4)	(5)
Breastfeeding Experience (1)					
Race (2)	-.008				
Coping Appraisals (3)	.255**	.212*			
Threat Appraisals (4)	.272**	.140	.420**		
Information Acceptance (5)	.037	.092	.512**	.539**	

Note: n = 114-120. Entries are Pearson correlation coefficients.

** p < .01; *p < .05

Table 9. Multiple Regression Analyses, Using Threat Appraisals and Coping Appraisals to Predict Breastfeeding Intentions (Controlling for Race and Breastfeeding Experiences). Sample n = 112

Model Summary and Steps		R	R Square	Adjusted R Square	Std. Error of the Estimate	
Step 1: Entering Control Variables		.361	.130	.114	1.30223	
Step 2: Entering Control & Predictor Variables		.671	.450	.430	1.04503	
		Sum of Squares	df	Mean Square	F	Sig.
Step 1: Entering Control Variables	Regression	27.657	2	13.829	8.155	.001
	Residual	184.842	109	1.696		
	Total	212.499	111			
Step 2: Entering Control and Predictor Variables	Regression	95.646	4	23.911	21.895	.000
	Residual	116.853	107	1.092		
	Total	212.499	111			
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Step 1: Entering Control Variables	(Constant)	4.364	.368		11.861	.000
	Race	-.002	.328	.000	-.006	.996
	Breastfeeding Experience	.630	.156	.361	4.038	.000
Step 2: Entering Control and Predictor Variables	(Constant)	2.859	.352		8.114	.000
	Race	-.491	.270	-.134	-1.815	.072
	Breastfeeding Experience	.272	.134	.156	2.032	.045
	Coping Appraisals	.350	.055	.527	6.367	.000
	Threat Appraisals	.029	.014	.164	2.027	.045

Notes:

- Race is a binary variable (0 = Caucasian, 1 = Minority)
- Constant and Control variable probabilities are two-tailed.
- Predictor variable probabilities are one-tailed.

Table 10. Multiple Regression Analyses, Using Information Acceptance to Predict Breastfeeding Intentions (Controlling for Race and Breastfeeding Experiences). Sample n = 117

Model Summary and Steps		R	R Square	Adjusted R Square	Std. Error of the Estimate	
Step 1: Entering Control Variables		0.322	.103	.088	1.36386	
Step 2: Entering Control & Predictor Variables		0.482	.232	.212	1.26778	
		Sum of Squares	df	Mean Square	F	Sig.
Step 1: Entering Control Variables	Regression	24.449	2	12.225	6.572	0.002
	Residual	212.054	114	1.860		
	Total	236.503	116			
Step 2: Entering Control and Predictor Variables	Regression	54.881	3	18.294	11.382	0.000
	Residual	181.622	113	1.607		
	Total	236.503	116			
		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
Step 1: Entering Control Variables	(Constant)	4.437	0.383		11.583	.000
	Race	-0.069	0.335	-.018	-0.206	.837
	Breastfeeding Experience	0.583	.161	.321	3.618	.000
Step 2: Entering Control and Predictor Variables	(Constant)	1.446	0.774		1.867	.064
	Race	-0.195	0.313	-.052	-0.622	.535
	Breastfeeding Experience	0.540	.150	.297	3.597	.000
	Information Acceptance	0.786	0.181	.361	4.351	.000

Notes:

Race is a binary variable (0 = Caucasian, 1 = Minority)
 Constant and Control variable probabilities are two-tailed.
 Predictor variable probabilities are one-tailed.

Summary of Findings

While the study reinforced some of the findings in the literature, other findings were not supported. Regarding message framing, significant results were quite limited. This study was only able to detect a significant positive relationship between the loss-frame message group and threat appraisals of outcomes associated with not breastfeeding. The loss-framed message did not predict coping appraisal or negative affect as originally hypothesized. Additionally, none of the hypothesized gain-frame message relationships were supported. Potential reasons for the lack of findings regarding message frames will be discussed later.

Whereas this study found limited findings regarding message framing, this study did find support for the application of PMT in predicting breastfeeding intentions. Both threat and coping appraisals of the outcomes associated with breastfeeding were found to significantly positively predict breastfeeding intentions. Moreover, this study proposed the addition of negative affect and information acceptance to the traditional PMT model. The analyses of this study support the inclusion of these two measures as the findings show threat appraisals significantly positively predicted negative affect, while coping appraisals significantly positively predicted information acceptance.

CHAPTER 5

DISCUSSION

While the benefits of breastfeeding are generally well-known, breastfeeding rates in the United States continue to be suboptimal. This study recognizes the complexity of breastfeeding and the various elements that affect a mother's success in her breastfeeding efforts. Factors including but not limited to perceived social support, guidance and support from health-care providers, work environment, past breastfeeding experience, breastfeeding knowledge, and self-efficacy.

Moreover, breastfeeding differs from traditional health risk perceptions in that there are multiple risks involved, risks that impact the immediate and long-term health of mother and child. As many of the health benefits associated with breastfeeding are not immediately observable, mothers may not be as worried about the risks associated with not adopting the behavior. Furthermore, there are also many perceived costs associated with breastfeeding. Due to the complexity of the behavior, health professionals face many challenges in their efforts to promote the behavior.

Recognizing that many elements contribute to breastfeeding success, just like many other health behaviors, the adoption of the behavior often develops from behavioral intentions. Previous research studies have found prenatal intention to breastfeed had an influence on both initiation and duration of breastfeeding (Donath & Amir, 2003). Understanding the factors that influence a mother's decision to breastfeed and how women respond to various health messages promoting breastfeeding may be the first step in discovering ways to motivate new mothers to choose to breastfeed.

This study's main objective was to determine factors that influence breastfeeding intentions and moderate the effects of message frames. This study investigated whether gain- and loss-framed messages as compared to a neutral message differentially impacted behavioral intentions to breastfeed. In doing so, this study aimed to investigate the extent to which Protection Motivation Theory, with the addition of negative affect and information acceptance, explains variation in the behavioral intentions to breastfeed among female college students. The overall goal of this study was to identify the best way to communicate the benefits and risks associated with breastfeeding in hopes of increasing the chances of motivating new mothers to

breastfeed. Based on the results of the study, several theoretical concepts are worthy of discussion.

Message Framing

This study hypothesized a relationship between message frame and threat and coping appraisals. While no relationships were detected in regards to coping appraisals, the loss-frame message significantly positively predicted threat appraisal, while the gain-frame message did not.

When considering this study's lack of significant findings regarding message framing, it is should be noted that the literature on message framing has produced inconsistent results in regards to when loss- and gain-framed messages are most effective (O'Keefe & Jensen, 2006, 2007). One possible explanation for the inconsistencies in the literature, as suggested by Latimer and colleagues (2012), is the degree of variability in how individuals perceive the risks associated with a specific behavior. Prior research has shown a positive relationship between loss-framed messages and high perceived risk (Maheswara & Meyers-Levy, 1990; Meyerowitz, Wilson, & Chaiken, 1991; Rothman, Pronin, & Salovey, 1996; Gallagher et al, 2011). While some studies have found that low perceptions of risk are sensitive to gain-framed messages (Toll et al, 2008; Apanovitch, McCarthy, & Salovey, 2003), other studies have found no advantage of either frame for low perceived risk (Meyerowitz, Wilson, & Chaiken, 1991; Gallagher et al, 2011).

Moreover, no significant results were found for the hypothesized relationships between message frame and negative affect. Prior research has shown that gain-framed information tends to elicit more positive affect than loss- framed information, and loss-framed information generally elicits more negative affect than gain-framed information (Chang, 2005; Cox, Cox & Zimet, 2006; Cox & Cox, 2001; Millar & Millar, 2000; Schneider et al., 2001; Shen & Dillard, 2007; Van't Riet et al, 2010). This study was unable to replicate these findings.

Though not hypothesized, post-hoc analyses were conducted to examine whether gain- and loss-framed messages had a direct relationship with breastfeeding intentions. The results of the multiple regression model produced no significant relationships between message frame and intentions.

Additionally, post-hoc analyses were conducted to directly compare the gain- and loss-framed messages, excluding the neutral condition. The multiple regression analyses of H1, H2, and H3 using a dummy variable (1 = gain-frame message, 0 = loss-frame message), showed no

significant results. Thus, indicating that, in regards to H1, while there are differences between loss and neutral messages, there are no significant differences between the loss and gain message strategies.

Threat Appraisals

PMT suggests that threat appraisal is comprised of perceived maladaptive rewards accompanying a behavior (in this case, the behavior would be formula feeding, or not breastfeeding) minus the perceived severity of the threat and the perceived vulnerability to this threat. Greater levels of fear should be aroused if an individual perceives him or herself to be vulnerable to a serious health threat and this will increase an individual's motivation to engage in protective behavior. Based on PMT and prior research suggesting worry is related to risk perceptions (Klein, 2003), this study proposed positive relationships between threat appraisal and negative affect and threat appraisal and behavioral intentions. The results of this study were consistent with prior research and in line with PMT. Threat appraisal was found to have a significant positive relationship with feelings of worry and behavioral intentions to breastfeed.

Coping Appraisals

The literature on fear appeals suggests that a greater sense of threat might increase persuasiveness, but only if recipients feel capable of averting the threat (Rogers, 1983; Stephenson & Witte, 1998; Witte, 1992, 1994). This study hypothesized that coping appraisals would have a negative relationship with negative affect, suggesting that levels of worry may be decreased by higher levels of self-efficacy. However, the hypothesis was unsupported and coping appraisal did not significantly predict negative affect.

Moreover, this study found that coping appraisal significantly positively predicted information acceptance and breastfeeding intentions. These findings are in line with the PMT literature and research suggesting that low self-efficacy may result in decreased message acceptance due to defensive avoidance (Van 't Riet, Ruiter, Werrij, & de Vries, 2010). The results of this study mirror the results of a study by Van 't Riet, Ruiter, Werrij, and de Vries (2010) focusing on skin self-examination. The authors found that when self-efficacy was low, ratings of message acceptance were also low.

Negative Affect

The literature on affect suggests that a message is more likely to be accepted if it elicits more positive than negative cognitions or if it leads to relatively little counterarguing (Van't, Ruiters, Verrij, & De Vries, 2010). Van't Riet and colleagues (2010) conducted an experiment using gain- and loss- framed messages about reducing salt intake and found that positive affect was significantly correlated with information acceptance. Also, gain-framed information resulted in higher levels of information acceptance than loss-framed information. When extreme, worry can potentially generate non-adaptive behaviors such as refusal to accept information. Based on these findings, this study proposed a negative relationship between negative affect and information acceptance. This study found a significant positive relationship between negative affect and information acceptance; however, it was in the opposite direction as hypothesized. One potential explanation may be that the levels of worry were not extreme, therefore they did not result in a non-adaptive response such as defensive processing of the information.

Van't Riet and colleagues (2010) also found that negative affect was significantly correlated with intention. The authors suggest that gain-framed information may have an effect on information acceptance through positive affect, whereas loss-framed information might be more likely to have an effect on intention through negative affect.

Once again, though not hypothesized, post-hoc analyses were conducted to test a direct relationship between negative affect and breastfeeding intentions. A multiple regression model with race and breastfeeding experience as control variables and negative affect as the predictor explained 11.6% of the variance in breastfeeding behavioral intentions ($R^2 = .116$, $F(3,114) = 5.987$, $p = .001$). Negative affect significantly positively predicted behavioral intentions ($\beta = .193$, $t(114) = 2.146$, $p = .034$).

Information Acceptance

This study hypothesized a positive relationship between information acceptance and behavioral intentions. However, due to an issue with multicollinearity between information acceptance and threat appraisal, information acceptance was dropped from the multiple regression model. When a model was tested employing information acceptance as the only predictor, information acceptance significantly positively predicted breastfeeding intentions.

Thus, this study cannot provide conclusive support regarding information acceptance as a predictor of breastfeeding intentions.

Limitations

This study faced a number of limitations. One of the largest constraints of this study was sample size. The small sample size may have been a product of the recruitment process, inability to email students directly, or general sensitivity surrounding the topic of breastfeeding. As mentioned earlier, for the recruitment of participants in this study, department chairs were asked to voluntarily forward recruitment information to their students. If they chose not to, students in that department did not receive the recruitment email. Therefore, there was no way to assure that each female student between the ages of 23 and 40 at Florida State University received a recruitment letter and may possibly limit the representative nature of the sample.

This study may have potentially benefited by employing additional strategies to increase sample size, such as: offering incentives, using more than one mode for data collection, following up with reminders (Fowler, 2002). As participation was voluntary and self-selected, employing one or more of these methods may help to reduce bias among respondents that chose to participate. With self-selection, the results may not generalize from the self-selected sample to some larger population (Birnbaum, 2004)

In addition to the small sample size, another potential limitation of this study is that the majority of the sample is Caucasian and are working on a college degree. Research shows that low rates of breastfeeding are often found among minority women with less education. Data including a more diverse composite of race, ethnicity, and education levels may produce different results.

Furthermore, the use of an online survey may have a few weaknesses compared with other data collection methods. While online, respondents may not be fully engaged in the survey or they may not complete the survey in one sitting, decreasing their involvement with the survey. They may also terminate the survey early due to distraction, Internet connection issues, or browser issues.

This leads us to another major constraint of this study, the fairly large percentage of dropouts, or surveys that were started but not completed (approximately 43%). Web-based research has been found to have larger dropout rates than lab studies (Birnbaum, 2004). In the lab, the presence of other people may deter participants from leaving early. Web participants can

simply click a button to quit the study and do something else. Musch and Reips (2000) found that the average dropout rate in Internet experiments is 34%. The authors showed that completion of Internet experiments was 86% if some form of reward (individual payments or lottery prizes) was offered, up from 55% without such rewards.

The high percentage of incomplete surveys leads to concerns about whether the final sample of respondents accurately represents the originally selected sample. Dropout can result from interactions between certain web browser versions and incompatible elements on web pages (Reips, 2002). Again, another potential explanation for terminating the survey early may be the sensitivity and personal nature of subject. One possible way to address this issue would be to ask a number of questions prior to presenting the stimulus message and then following up with additional questions after message exposure (i.e. Thomas et al, 2011). Frick et al. (2001) found evidence suggesting that placing questions for personal information at the beginning of an Internet study will lower dropout rates.

Future Research and Implications

Future research should take into consideration the limitations of this study and aim to recruit a more diverse sample. In addition, other studies should explore ways to decrease the amount of incomplete surveys received. Additional research methods should be explored to better address the issue of sensitivity of the topic. It is important that the survey instrument delicately address the personal and complex nature of breastfeeding to avoid making respondents uncomfortable, which, in turn, increases the chances of early termination of the survey.

This study was only able to find limited support for the use of message framing in the promotion of breastfeeding. One potential explanation for the lack of findings may be that the manipulation of the message frames was not strong enough. To check whether the manipulation of framing was successful, participants were asked to indicate how well the information in the message at the beginning of the survey presented the risks associated with not breastfeeding versus the benefits of breastfeeding (1 = *It focused heavily on the costs of not breastfeeding*; 5 = *It focused heavily on the benefits of breastfeeding*) and whether the arguments presented were (1) *very negative* to (7) *very positive*. Responses to the items were spread out amongst the three message groups. It is possible that respondents thought the neutral message was relatively positively.

Future research should take appropriate measures to ensure that the manipulation of message frames is successful. While this study conducted a pilot study to test messages and survey, it would have been beneficial to conduct an additional test to make sure the changes made to the message stimuli based on the pilot test results were effective. Due to the sensitive and complex nature of the subject, it is crucial that the message manipulations are interpreted in the way intended.

An additional consideration is that the framed messages were not well received by respondents, which could be indicated by the fairly large number of incomplete surveys received. Again, this could potentially be due to the sensitivity of the subject and the sample respondents viewing the messages as being biased or insensitive to the complexity of the subject. Future researchers will need to find a balance between messages that present both positive and negative arguments and are well received without seeming biased.

However, the current study is still able to offer a contribution to the area of breastfeeding promotion. Health professionals developing breastfeeding messages should consider the use of Protection Motivation Theory as a guiding framework for the development of messages. This study found support for threat appraisals and coping appraisals as predictors of behavioral intentions. This provides support for the inclusion of perceived risk, maladaptive rewards, self-efficacy, response efficacy, and response costs in future health communication messages promoting breastfeeding. As this study examined the components of PMT as threat appraisals and coping appraisals, future breastfeeding intentions research may consider examining the components of threat appraisal and coping appraisal individually, as opposed to as an index, to investigate the strength of their effects on breastfeeding intentions.

Further research may consider investigating the issue of the high multi-collinearity among the threat appraisal, coping appraisal, and information acceptance. Future studies should also take a closer look at the relationships between these variables and breastfeeding intentions. In addition, the results concerning negative affect and information acceptance warrant further investigation.

Furthermore, this study offers support for the addition of negative affect and information acceptance when using PMT. Threat appraisals significantly positively predicted negative affect and coping appraisals significantly positively predicted information acceptance. Both negative affect and information acceptance were found to significantly positively predict behavioral

intentions.

The findings of this study provide some support for the use of loss-frame messages to influence breastfeeding intentions by way of threat appraisals associated with breastfeeding. This suggests that applying a loss-frame to breastfeeding messages employing the PMT framework may be useful. Future theoretical research should continue to investigate the use of message framing with Protection Motivation Theory to predict behavioral intentions, breastfeeding as well as other health protective behaviors.

Considering the complexity of factors surrounding breastfeeding initiation, to minimize breastfeeding disparities in the United States, the efforts of public health professionals will likely need to be multifaceted, involving several types of interventions, as suggested by Chapman and Pérez-Escamilla (2012). The findings of this study point to the need for health professionals to discuss the risks associated with not breastfeeding, self-doubt regarding the ability to breastfeed, and concerns regarding the challenges of breastfeeding when speaking with pregnant women about their breastfeeding intentions.

APPENDIX A

SURVEY QUESTIONNAIRE

Thank you for choosing to participate in this survey. The survey will take approximately 15-20 minutes and will be completely anonymous. First, you will be presented with an informational message. Please read the message in its entirety before moving on.

Neutral message

Dear participant,

Motherhood is filled with both joys and challenges. Many of the experiences of becoming a first time parent are new experiences surrounded by uncertainty. New mothers face uncertainty with respect to how best to take care of the baby. There are so many decisions to make for your new baby regarding prenatal care, the birth of your child, diapering, immunizations, pediatricians, baby gear, and more.

One big decision a mother must make is how she will feed her infant. The decision to breastfeed or formula feed is a very personal one and is often influenced by many factors. A new mother may consider nutritional value, cost, and convenience, among other things.

Of course, expectant mothers are concerned with how best to protect their child from illness and disease, such as ear infections, diarrhea, diabetes and obesity. When deciding how to feed her child, a new mother may consider what is best for the child's health and nutrition. Breast milk and formula differ in nutritional composition, are digested differently, and differ in protection of an infant's health.

In addition to worrying about the infant's health, new parents worry about finances. New mothers must consider potential costs associated with infant feeding. While breastfeeding is free, some mothers may need to consider the cost of a breast pump and bottles. With formula feeding, the mother will have to consider costs associated with the formula and bottles. Depending on the type of formula –powdered, concentrated, ready-to-feed, or specialty (i.e. soy or hypoallergenic)—costs will vary.

Additional concerns will center on challenges regarding time and convenience. Challenges with formula include preparation of the formula, which involves measuring formula, mixing with water or milk, sterilizing nipples, refrigeration, and warming of bottles. Breastfeeding challenges may include nursing making it hard for new mothers to work, run errands, or travel because of the frequency of feedings or the need to pump during the day.

As mentioned, this decision is an important one that involves the consideration of many factors. Ultimately, a mother's decision will have to be based on what is best for her and her child.

Gain-framed message

Dear participant,

The method of infant feeding is one of the most important decisions a mother will make. Choosing to breastfeed increases an infant's protection from many diseases and illnesses. In addition, breastfeeding reduces maternal health risks and financial and environmental costs.

Outcomes for child

Current research indicates that breastfeeding is associated with a decrease in an infant's risk of experiencing recurrent ear infections and diarrhea. When an infant is breastfed, their chances of contracting lower-respiratory infections and asthma decrease. Risk of childhood obesity and Type-2 diabetes also decreases. Research has also shown that breastfeeding lowers the risk of unexpected, sudden death of an infant, otherwise known as Sudden Infant Death Syndrome (SIDS).

Breastfeeding not only provides nourishment for the infant, but also provides comfort and security. Breastfeeding soothes an infant when they are lonely, frightened or in pain.

Furthermore, breastfeeding protects against potential allergies sometimes associated with infant formula and the various types of milk mixed with formula. Infants that are exclusively breastfed for a minimum of 4 months are also found to have fewer food allergies.

Outcomes for mother

Recent studies indicate that for mothers, breastfeeding is associated with lower risk of breast and ovarian cancer. Breastfeeding is also associated with lower risk of Type-2 diabetes. Mothers that breastfed can experience increased weight loss as they tend to burn up to an average of 500 extra calories a day producing breast milk. Breastfeeding releases the hormone oxytocin, a hormone that helps the uterus return to its pre-pregnancy size and may reduce uterine bleeding after birth. The increased levels of oxytocin production found in breastfeeding mothers is also associated with lower reported levels of stress and negative moods. Findings also show that breastfeeding also increases maternal and infant bonding when compared to formula feeding.

In addition, breastfeeding eliminates the nearly \$1,500 per year costs associated with formula and feeding. Breastfeeding does not involve measuring formula, mixing with water or milk, sterilizing nipples, or warming bottles, requiring less time than formula feeding.

Economical & Environmental Outcomes

Current estimates indicate that increased rates of breastfeeding could save \$13 billion per year in the United States. Medical care costs are lower for fully breastfed infants than never-breastfed infants. In addition, breastfed infants typically need fewer sick care visits, prescriptions, and hospitalizations.

Furthermore, breastfeeding is also better for the environment. There is less trash and plastic waste compared to that produced by formula cans and bottle supplies.

Loss-framed message

Dear participant,

The method of infant feeding is one of the most important decisions a mother will make. Choosing not to breastfeed lowers an infant's protection from many diseases and illnesses. In addition, not breastfeeding increases maternal health risks and financial and environmental costs.

Outcomes for child

Current research indicates that not breastfeeding is associated with an increase in an infant's risk of experiencing recurrent ear infections and diarrhea. When an infant is not breastfed, their chances of contracting lower-respiratory infections and asthma increase. Risk of childhood obesity and Type-2 diabetes also increases. Research has also shown that not breastfeeding increases the risk of unexpected, sudden death of an infant, otherwise known as Sudden Infant Death Syndrome (SIDS).

While formula feeding provides nourishment for the infant, it does not provide the same type of comfort and security as breastfeeding. In particular, formula does not soothe an infant when they are lonely, frightened or in pain.

Furthermore, formula feeding involves risk of potential allergies to ingredients in the formula or the type of milk mixed with the formula. Infants that are not breastfed are found to have more food allergies.

Outcomes for mother

Recent studies indicate that for mothers, not breastfeeding is associated with higher risk of breast and ovarian cancer. Not breastfeeding is also associated with higher risk of Type-2 diabetes. Mothers that do not breastfeed do not experience the increased weight loss that comes with burning extra calories when producing breast milk. Not breastfeeding inhibits the release of the hormone oxytocin, a hormone that helps the uterus return to its pre-pregnancy size and reduce uterine bleeding after birth. The lower levels of oxytocin production found in mothers that do not breastfeed is also associated with higher reported levels of stress and negative moods. Findings also show that not breastfeeding has been found to be associated with lower levels of maternal and infant bonding when compared to breastfeeding.

In addition, formula and feeding supplies can cost nearly \$1,500 each year. Formula feeding involves measuring formula, mixing with water or milk, sterilizing nipples, and warming bottles, requiring more time than breastfeeding.

Economical & Environmental Outcomes

Current estimates indicate that lower rates of breastfeeding could cost \$13 billion per year

in the United States. Medical care costs are higher for never-breastfed infants than fully breastfed infants. In addition, infants that are not breastfed typically need more sick care visits, prescriptions, and hospitalizations.

Furthermore, not breastfeeding also has environmental costs. Formula cans and bottle supplies create more trash and plastic waste.

Now that you have read the informational message, you will be asked a series of questions. If you do not currently have children, please think about children you may have in the future when answering these questions.

1. If you do not breastfeed, how likely is it that your child would experience the following:

Ear infections	1 = <i>Very unlikely</i>	2	3	4	5	6	7 = <i>Very likely</i>
Diarrhea	1 = <i>Very unlikely</i>	2	3	4	5	6	7 = <i>Very likely</i>
Asthma	1 = <i>Very unlikely</i>	2	3	4	5	6	7 = <i>Very likely</i>
Obesity	1 = <i>Very unlikely</i>	2	3	4	5	6	7 = <i>Very likely</i>
Risk of Sudden Infant Death Syndrome (SIDS)	1 = <i>Very unlikely</i>	2	3	4	5	6	7 = <i>Very likely</i>

2. If you do not breastfeed, how serious would it be if your child experienced the following:

Ear infections	1 = <i>Not at all serious</i>	2	3	4	5 = <i>Very serious</i>
Diarrhea	1 = <i>Not at all serious</i>	2	3	4	5 = <i>Very serious</i>
Asthma	1 = <i>Not at all serious</i>	2	3	4	5 = <i>Very serious</i>
Obesity	1 = <i>Not at all serious</i>	2	3	4	5 = <i>Very serious</i>
Risk of Sudden Infant Death Syndrome (SIDS)	1 = <i>Not at all serious</i>	2	3	4	5 = <i>Very serious</i>

3. Please indicate how much you agree or disagree with the following statement:

I feel like the health risks associated with not breastfeeding are serious.
(1= *Strongly disagree*, 7 = *Strongly agree*).

4. Please indicate how much you agree or disagree with the following statement:

Breastfeeding can help keep your baby safe from the above diseases and illnesses.
(1= *Strongly disagree*, 7 = *Strongly agree*).

5. How worried or concerned are you that your child will experience the following:

Ear infections	1 = <i>Not at all concerned</i>	2	3	4	5 = <i>Extremely concerned</i>
Diarrhea	1 = <i>Not at all concerned</i>	2	3	4	5 = <i>Extremely concerned</i>
Asthma	1 = <i>Not at all concerned</i>	2	3	4	5 = <i>Extremely concerned</i>
Obesity	1 = <i>Not at all concerned</i>	2	3	4	5 = <i>Extremely concerned</i>
Risk of Sudden Infant Death Syndrome (SIDS)	1 = <i>Not at all concerned</i>	2	3	4	5 = <i>Extremely concerned</i>

6. Please indicate how much you agree or disagree with the following statement:

I feel more comfortable with formula feeding than breastfeeding.
(1= *Strongly disagree*, 7 = *Strongly agree*).

I feel formula feeding is more reassuring because they can visualize the amount of milk the baby is ingesting.
(1= *Strongly disagree*, 7 = *Strongly agree*).

I feel formula feeding is more enjoyable for the mother because she won't have to worry about what she eats affecting the baby.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Formula feeding is easier than breastfeeding.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Formula feeding is more compatible with work and school.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Mothers that formula feed have more freedom than mothers that breastfeed.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Mothers that do not breastfeed do not have to worry about pumping and storing milk.
(1= *Strongly disagree*, 7 = *Strongly agree*).

By choosing not to breastfeed, someone else can feed the baby when necessary.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Most of my friends and family have chose not to breastfeed.
(1= *Strongly disagree*, 7 = *Strongly agree*).

7. Please indicate how much you agree or disagree with the following statements:

Breastfeeding can help keep a baby healthy.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding benefits the mother's health.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding enhances the bond between mother and child.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding provides comfort and security for the infant.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding costs less than formula feeding.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding is environmentally friendly.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding is inconvenient.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding is embarrassing.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding is hard.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding is painful.
(1= *Strongly disagree*, 7 = *Strongly agree*).

Breastfeeding is difficult while working or going to school.
(1= *Strongly disagree*, 7 = *Strongly agree*).

8. Please indicate your level of confidence regarding the following statements:

I will be able to successfully cope with breastfeeding like other challenging tasks.
(1= *Not at all confident*, 5 = *Very confident*).

I will be able to depend on family to support my decision to breastfeed.
(1= *Not at all confident*, 5 = *Very confident*).

I will be able to motivate myself to breastfeed successfully.
(1= *Not at all confident*, 5 = *Very confident*).

I will be able to breastfeed my baby without using formula as a supplement.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to refrain from bottle-feeding for the first 4 weeks.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to feed my baby with breast milk only.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to stay motivated to breastfeed my baby.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to keep wanting to breastfeed my baby for at least 6 months.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to comfortably breastfeed with my family members present.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to be satisfied with my breastfeeding experience.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to comfortably breastfeed in public.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to deal with the fact that breastfeeding can be time consuming.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to accept that fact that breastfeeding may limit my freedom.

(1= *Not at all confident*, 5 = *Very confident*).

I will be able to breastfeed and go to school or work.

(1= *Not at all confident*, 5 = *Very confident*).

9. Do you have children? (yes/no)

10. How many children do you have? ____

11. Did you breastfeed any of your children?

Yes, I did breastfeed.

Yes, I am currently breastfeeding.

No, I did not.

12. The last child you breastfed, for what length of time did you breastfeed?

Breastfed infant < 1 month.

Breastfed infant > 1 month but < 6 months.

Breastfed infant > 6 months but < 1 year.

__ Breastfed infant for 1 year or more.

13. Across all pregnancies, what is the total amount of time you breastfeed?

- 1 month or less.
- 1-3 months.
- 3-6 months.
- 6-12 months.
- 12-18 months.
- 18-24 months.
- 2 years or more.

14. Were you breastfed?

- 1) Yes 2) No 3) Don't know

15. Have you observed family members or friends who successfully breastfed?

- 1) Yes 2) No

16. Have close friends and family shared the benefits of breastfeeding with you?

- 1) Yes 2) No

17. Thinking about the future, how likely is it that you will breastfeed?

(1 = *Very unlikely*, 7 = *Very likely*).

18. Please indicate how much you agree or disagree with the following statements:

I plan to breastfeed for at least 6 months.

(1 = *Strongly disagree*, 7 = *Strongly agree*).

I intend to exclusively breastfeed my child for at least 3 months.

(1 = *Strongly disagree*, 7 = *Strongly agree*).

19. Thinking about the message at the beginning of the survey, how would you describe the information?

The information was relevant.	1 = <i>Strongly disagree</i>	2	3	4	5 = <i>Strongly agree</i>
The information was interesting.	1 = <i>Strongly disagree</i>	2	3	4	5 = <i>Strongly agree</i>
The information was objective.	1 = <i>Strongly disagree</i>	2	3	4	5 = <i>Strongly agree</i>
The information was true.	1 = <i>Strongly disagree</i>	2	3	4	5 = <i>Strongly agree</i>
The information was convincing.	1 = <i>Strongly disagree</i>	2	3	4	5 = <i>Strongly agree</i>
The information was believable.	1 = <i>Strongly disagree</i>	2	3	4	5 = <i>Strongly agree</i>
The information was useful.	1 = <i>Strongly disagree</i>	2	3	4	5 = <i>Strongly agree</i>

20. Thinking about the message at the beginning of the survey, please indicate if you agree or disagree with the following statement:

The message I received tried to manipulate my feelings.

(1=*Strongly disagree*, 7=*Strongly agree*).

21. Thinking about the message at the beginning of the survey, the arguments presented were:
(1= *Very negative*; 7 = *Very positive*).

22. Please rate how well the message presented the risks associated with not breastfeeding versus the benefits of breastfeeding.
(1 = *It focused heavily on the costs of not breastfeeding*; 5 = *It focused heavily on the benefits of breastfeeding*).

23. What is your age?
()

24. What is your race?
1) African American 2) White
3) Asian 4) Native American 5) Other

25. Are you Hispanic or Latina?
1) Yes 2) No

26. What is your marital status?
1) Single 2) Married 3) Divorced 4) Widowed

27. What degree are you currently seeking?
1) Undergraduate 2) Graduate 3) Professional (Law, Medicine) 4) Other

Thank you.

-End of survey-

APPENDIX B

IRB LETTER OF APPROVAL

Office of the Vice President for Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 03/07/2013

To: Monica Esquibel mae0501@my.fsu.edu

Dept.: COMMUNICATION

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
Examining the influence of risk perceptions and self-efficacy on message framing: Increasing breastfeeding Intentions

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Expedited per 45 CFR § 46.110(7) and has been approved by an expedited review process. The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Gary Heald gheald@cci.fsu.edu, Advisor
HSC No. 2012.9178

-End of document-

APPENDIX C

APPROVED INFORMED CONSENT FORM

Title of Research: Perceptions of Potential Benefits and Risks Associated with Breastfeeding
Investigator: Monica Esquibel, PhD Candidate in the School of Communication

Before agreeing to participate in this research study, it is important that you read the following explanation of this study. This statement describes the purpose, procedures, benefits, risks, discomforts, and precautions of the program. Also described is your right to withdraw from the study at any time.

Explanation of Procedures

This research study is designed to understand how women perceive potential maternal and infant health benefits and risks associated with breastfeeding. Participation in this study involves completion of a short survey which will take approximately twenty minutes to complete.

Risks/Discomforts and Benefits

Some of the questions in the survey might make you mildly uncomfortable, as they are of a personal nature. If you feel discomfort and wish to discontinue, you can choose to quit the survey at anytime. The anticipated benefit of participation is the opportunity to contribute to research that may aid in enhancing maternal and infant health.

Confidentiality

The records of this study will be kept private and confidential to the extent permitted by law. Research data will be stored securely and only the researchers will have access to the study data. The results of the research will be published in the form of a dissertation and may be published in a professional journal or presented at professional meetings. Any publications to transpire from this study will not contain identifying information.

This study will be anonymous. Respondents will not be asked to provide their names or any identifying information and the survey is conducted online. Participants can decide not to continue at any point during the survey, but after the survey is submitted, it cannot be withdrawn.

Withdrawal without Prejudice

Participation in this study is voluntary; refusal to participate will involve no penalty. Each participant is free to withdraw consent and discontinue participation in this study at any time without prejudice from the University.

Contacts and Questions

The researcher conducting this study is Monica Esquibel. If you have any questions regarding this study, you are encouraged to contact the researcher by email at mae0501@my.fsu.edu, or her academic advisor, Dr. Gary Heald, at gheald@cci.fsu.edu.

If you have any questions or concerns regarding this study and would like to speak with someone other than the researcher(s), you are encouraged to contact the FSU IRB at 850-644-8633 or by email at humansubjects@magnet.fsu.edu.

Please list the risks and benefits related to this study as you understand them:

Statement of Consent:

If you agree to participate in the survey, please click the arrow below to begin answering questions.

APPENDIX D

SURVEY RECRUITMENT LETTER

Hello,

My name is Monica Esquibel and I am a PhD student in the School of Communication. The reason that I am contacting you is that I am currently recruiting participants for a study focusing on breastfeeding perceptions and would like to ask you to please consider participating.

While I understand you are likely busy during the final weeks of the semester, participation in this study involves taking a survey online and would only require approximately 20 minutes of your time.

The main objective of the study is to understand how women perceive potential maternal and infant health outcomes associated with breastfeeding. I would like to assure you that the study has been reviewed and received clearance through a Florida State University Human Subjects Committee. The study is anonymous and the decision to participate is yours. I would be ever grateful for your time and participation.

If you are a female, between the ages 23-40, and you are willing to participate in this study, please click on the survey link below to begin the survey:

https://fsu.qualtrics.com/SE/?SID=SV_0SORluW2IPYRoA5

Thank you.

Warm regards,

Monica Esquibel
School of Communication
Florida State University

If you have any questions please contact me at mae0501@my.fsu.edu

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BIOGRAPHICAL SKETCH

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