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Student's Explicit and Implicit Attitudes Regarding Breastfeeding in Public : Analyzed Through FaceReader™ Technology

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Abstract:

INTRODUCTION: The recommended length of time to exclusively breastfeed a child is six months. However, women are not meeting these rates because they are not receiving enough support from their communities. Societal support is essential to successful breastfeeding rates. **OBJECTIVE:** The aim of this study was to examine students' explicit and implicit attitudes toward women breastfeeding in public, to better understand the challenges associated with breastfeeding in public and social situations. **METHODS:** FaceReader™ technology was used to analyze participants' reactions to three images and one video clip of mothers breastfeeding in public. Questionnaires were used to record participants' explicit (self-reported) reactions on a 5-point Likert scale and facial expression technology was used to capture their implicit (facial) reactions to the images and video. Data was analyzed using a non-parametric Kruskal-Wallis test to determine the significance between each image/video clip and implicit and explicit responses. Pearson's Correlation test was used to determine any significant relationships between variables. **RESULTS:** Twenty-two students (14 undergraduate, 8 graduate) participated in the study. Men had more positive attitudes toward public breastfeeding than women did ($R^2= 0.256$; $p= .016$). Getting kicked out of a restaurant because of breastfeeding had significantly higher negative emotions than breastfeeding in a public park. Overall, participants generally had positive attitudes towards breastfeeding but were most comfortable when the woman in the image had showed the least breast exposure. **CONCLUSION:** Additional knowledge and positive exposure to public breastfeeding is needed to improve students' attitudes toward women breastfeeding in public.

MONTCLAIR STATE UNIVERSITY

Student's Explicit and Implicit Attitudes Regarding Breastfeeding in Public: Analyzed
Through FaceReader™ Technology

By

Kaitlin Doherty Overgaard

A Master's Thesis Submitted to the Faculty of

Montclair State University

In Partial Fulfillment of the Requirements

for the Degree of Master of Science

May 2019

College of Education and Human Services

Department of Nutrition and Food Studies

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Chapter 1 Introduction

Background

One of the first decisions parents tend to make is whether or not their child will be breastfed or given formula. This decision will affect that child's life for the next few days, weeks, months, and even year(s). Breast milk is produced with a high nutrient dense composition compared to formula. The cells, hormones, and antibodies in breastmilk change every feeding to meet the child's nutritional needs and to protect vulnerable infants and their growing immune systems.¹ This chapter will discuss the benefits and rates of breastfeeding, reasons why some mothers stop breastfeeding (including not receiving enough support from their communities), and breastfeeding in public.

Breastfeeding Benefits

The American Academy of Pediatrics (AAP) is a major advocate for breastfeeding based upon the unequivocal evidence that it protects against a variety of diseases such as: bacteremia, diarrhea, respiratory tract infection, necrotizing enterocolitis, otitis media, urinary tract infection, late-onset sepsis in preterm infants, type 1 and type 2 diabetes, lymphoma, leukemia, Hodgkins disease, and childhood overweight and obesity.² Research has also shown that breastmilk protects against asthma, ear infections, sudden infant death syndrome, and certain allergies.³⁻⁵ A research study found that, infants who were exclusively breastfed for four months and partially after had a decreased risk of upper respiratory infections, lower respiratory infections, and gastrointestinal infections, compared to infants who were never breastfed.⁶

In contrast, infant formula can cause adverse effects because it can be much harder to digest for children, especially premature infants (infants born before 37 weeks of gestation), compared to breastmilk. Nevertheless, parents choose formula over breastmilk for different personal reasons. One recent study observed the preparation of infant formula of low-income mothers living in the southeastern United States, and found that mothers reported cost and convenience to be factors in choosing formula over breastmilk.⁷ Even though these reasons are valid, it should be taken in to consideration that many infant formulas are costly and, made using cow's milk which can be difficult for an infant's under developed digestive tract to breakdown.¹

A 2018 research study conducted in Canada, analyzed 1,087 infants to determine the association between gut microbiome and overweight and obesity. Researchers found that exclusive formula feeding appeared to stimulate changes in microbiota that are associated with being overweight. The results also distinguished early infancy as a critical period when transient gut dysbiosis may lead to increased risk of overweight and obesity.⁸ All and all, breastmilk proves to be more favorable for an infant's body, specifically their digestive tract.

Breastfeeding is beneficial for new mothers as well. The skin-to-skin contact is beneficial for the infant and mother. Specifically, in mothers this close contact boosts the brain's oxytocin levels, which is a hormone that helps breastmilk flow and can calm the body.¹ Oxytocin levels can also have an antidepressant effect.⁹ In fact, researchers in Germany found that for as long as breastfeeding is continued oxytocin will be released which in turn will reduce stress and blood pressure and can even raise a person's pain threshold.¹⁰ More importantly, these mother and child interactions during the first year are

beneficial to help establish social-emotional capacities, a wider range of flavor preferences and/or food choices as the child grows.¹¹

Also, breastfeeding aids in decreasing the mother's chances of diseases, postpartum depression, and certain cancers.¹² Breastfeeding and its association to breast cancer has been studied numerous times. In 2002, the largest individual-level analysis on the inverse association of breastfeeding and breast cancer was observed in about 50,000 patients with cancer and 47 studies analyzed.¹³ The findings suggest that the longer women breastfed the more they are protected against breast cancer. Similarly, Schwarz and Nothnagle also found that mothers who do not breastfeed are at a greater risk of breast cancer, diabetes mellitus, hyperlipidemia, hypertension, myocardial infarction, obesity, and ovarian cancer.¹⁴

Aside from health benefits, breastfeeding can make for a more productive workforce and save money. Mothers who breastfeed may miss less work to care for sick infants, than those who provide formula.¹⁵ Having fewer doctor and/or hospital visits can reduce medical costs and ultimately save families money. Research has shown that if 90% of families exclusively breastfed for six months, the United States could save an estimated \$13 billion per year in direct health care costs (formula, doctor/hospital visits, clinic, and laboratory fees) and indirect costs (loss of parent wages from caring for an ill child).¹⁶ Additionally, about 900 deaths among infants could be prevented annually.¹⁶ Breastfeeding not only saves money on medical costs but also saves money from parents' wallets as well. It is estimated to cost a family \$1,200-1,500 for purchasing formula for the first year of an infant's life, compared to breastmilk which the human body produces.¹⁵

Breastmilk is also considerably more beneficial to the environment than formula, specifically formula made from cow's milk. Greenhouse gases are emitted into the environment from cow's milk production, including the processing and transportation of the product.¹⁸ Globally for every 100 kg of raw milk produced and processed, only 20 kg is used for producing powdered milk, leading to production of 2.2 kg of powdered milk in formula containers.¹⁸ According to the Food and Agriculture Organization of the United Nations, for each 1 kg of powdered milk production and processing, 21.8 kg CO₂-eq of greenhouse gasses are emitted.¹⁷ For example, this means the amount of greenhouse gasses that are emitted from producing three, 12.5oz formula containers is equivalent to driving 53.3 miles, in an average passenger vehicle.¹⁹ This is an issue because hundreds of millions of formula containers are produced annually.²⁰

One study reported, in the United States more than 550 million containers, 86,000 tons of metal and 364,000 tons of paper are added to landfills every year from infant formula alone.²⁰ Not only are greenhouse gasses emitted from the production of the powdered milk formula but also in the creation of the packaging and transportation of formula containers. These containers are especially bad for the environment as they are typically made from aluminum and plastic, both non-biodegradable materials. The infant formula industry's carbon footprint is massive, though, formula production could be decreased if more women breastfed their infants.

Breastfeeding Rates

The global and national breastfeeding recommendations are set from extensive scientific research throughout decades, that has found breastfeeding to have multiple

benefits for the overall health of children and parents. The World Health Organization (WHO) advocates globally as a public health initiative, that infants be exclusively breastfed for the first six months to achieve optimal growth, development, and health.²¹ Additionally, the AAP recommends that infants should be fed breast milk exclusively for the first six months after birth. After six months to a year the parents should continue to breastfeed while adding in solid foods to the child’s diet, also referred to as complementary feeding.³ Breastfeeding then after can be continued as long as mutually desired by parent and child. Nationally, breastfeeding rates in the United States are continuing to rise from previous years and are on track to meet or exceed the United States Healthy People 2020 goals.²² See Table 1 for complete breastfeeding rates compared to the Healthy People 2020 goals.

Table 1. 2018 Breastfeeding rates compared to Healthy People 2020 goals.

	2018 Breastfeeding Rates	Healthy People 2020 Objectives
Infants ever breastfed	83.2%	81.9%
Infants breastfeeding at 6 months	57.6%	60.6%
Infants breastfeeding at 12 months	35.9%	34.1%
Infants exclusively breastfeeding at 3 months	46.9%	46.2%
Infants exclusively breastfeeding at 6 months	24.9%	25.5%

The Healthy People 2020 goals of breastfeeding rates will be met or surpassed in the near future. However, these rates are a relatively low percent for the entire nation. The Centers for Disease Control and Prevention (CDC) reported a high initiation rate of 4 out of 5 children (83.2%) breastfeeding at birth, but many stopped earlier than recommend. This can be seen from the steady decline of infants being exclusively breastfed at three and six months.²³

Despite the numerous benefits of breastfeeding for both the mother and child, infants are not being exclusively breastfed for the full recommended six-month time period for various personal reasons. Research has stated some reasons of having to stop breastfeeding, including issues with lactation, latching, concerns about the infant's nutrition, mothers having to take medication, unsupportive workplace or hospital policies, and/or lack of family support/cultural norms.²⁴⁻²⁶ Aside from medical or physical reasons, recently more research has emphasized the support (or lack thereof) that parents receive for breastfeeding. Stopping prematurely could suggest that parents may lack the support from their health care providers, workplace, or family members to continue breastfeeding.²⁴

Receiving societal support is essential to successful breastfeeding rates. For one, parents need guidance and support is from their health care providers but are not receiving this. One research study²⁷ held focus groups and observed the way mothers felt their health care providers were supporting them. These researchers found that the health care providers and mothers had different perceptions of support. All of the health care providers that were interviewed indicated that the clinic environment, nurses, and doctors (including themselves), have positive views on breastfeeding and actively support mothers as best as they could. On the other hand, mothers felt the support they were receiving was not enough, stating that when asking for advice they were not given a clear-cut answer on how to solve their nursing issue. The authors concluded that health care providers and mothers need to reconcile their definitions of support in order for mothers to continue breastfeeding.²⁷

Additionally, support for breastfeeding needs to be enforced in the workplace. The United States is the only developed country in the world without nationally required paid

maternity leave.²⁸ Without having a source of income many parents feel the need to return to work as soon as they can which can result in stopping breastfeeding earlier than recommended. However, this does not need to be the case because some women have the right to breastfeed at their workplace. According to the United States Department of Labor, section 7 of the Fair Labor Standards Act “requires employers to provide reasonable break time for an employee to express breast milk for her nursing child for one year after the child’s birth each time such employee has need to express the milk”.²⁹ Research has even shown that when employees receive support to express breast milk at work, they have increased health care savings,³⁰ higher productivity and satisfaction with their jobs³¹ and in return employees display higher retention rates.³² Supporting women about breastfeeding is essential to meet the AAP and WHO recommendations, particularly for women who choose to breastfeed outside the comfort of their home.

Breastfeeding in Public

For those who exclusively breastfeed for the fully recommended six months, public breastfeeding can be difficult to avoid. However, breastfeeding in public has become a controversial and sensitive topic, despite the fact that it is legal in all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands.³³ Thirty states, the District of Columbia, Puerto Rico, and the Virgin Islands even exempt breastfeeding from public indecency laws.³⁴ However, current social norms in the United States generally do not support public breastfeeding and numerous research studies have examined unsupportive breastfeeding in public.³⁵⁻³⁸

One research study reviewed public forums for women’s stories and opinions of breastfeeding in public and found three broad themes.³⁵ The first theme was ‘breastfeeding

as a human right' with positive comments stating breastfeeding is a natural way to feed a child. The second theme was 'permission within boundaries' with comments focusing on where, when, and how the mother is breastfeeding, reassuring that she be completely covered up. The last theme was 'public restraint of breast(feeding) as acknowledgement of the cultural status-quo,' with comments expressing that breasts are a sexual organ and should not be shown in public, especially if exposing other children to such an act. Additionally, the authors state that women should be aware if men (other than their partners) are in the vicinity and to cover-up accordingly. It is important to understand why these negative attitudes towards public breastfeeding are present and how we, as a society can change them.

Recently, more research has been done to investigate how societal attitudes toward women breastfeeding in public can influence women's comfort levels and overall success rates.³⁶ Stuebe and Bonuck³⁷ found that women who feel comfortable breastfeeding in public tend to breastfeed their child longer. Additionally, Roche, Owen, and Fung studied the appropriate public space to breastfeed. The researchers defined a public place as any space where a breastfeeding mother may be viewed by another person.³⁷ The public spaces they used in their study were a park, mall, restaurant, health clubs, library, places of worship, and general open spaces.³⁷ Their results showed that men felt more uncomfortable seeing their partners or other women breastfeeding in several public places than women did. Men felt the most comfortable when women were in a park and the most uncomfortable when women were breastfeeding in restaurants and places of worship.³⁸

Specifically looking at places of worship, the Pew Research Center for Religion and Public Life found that people who frequently (at least once a week) attend religious

services tend to be conservative.³⁹ Conservative ideas in regard to breastfeeding would be that breastfeeding is beneficial to the infant, but a mother should be covered if she chooses to nurse in public.⁴⁰ One recent research study looked at maternal religious involvement and breastfeeding initiation and duration. The researchers found that women who frequently attend religious services are more likely to initiate breastfeeding compared to those who never attend services. However, they also found that women who attended services frequently had a weaker association with breastfeeding for a full six months.⁴¹ These findings could suggest that these women did not receive the support they needed from their community to continue breastfeeding. Implications for future research from this study suggest implementing interventions within the religious setting and social networks, in order to build awareness and support within the community.⁴¹

Furthermore, a 2017 research study looked at men's attitudes toward public breastfeeding and factors associated with their visual perception of images of women. The researchers found that images of public breastfeeding are viewed less favorably by the sampled men than the images of women privately breastfeeding. Also, the research study notes that their knowledge and attitudes toward breastfeeding are positively associated with perception of breastfeeding images.⁴²

Foss and Blake³⁶ conducted a similar research study where they used entertainment-education to improve student's attitudes toward breastfeeding in public. The aim of their study was to explore how media influences the knowledge and attitudes of students, by having them view prime-time television clips that depicted public breastfeeding. Researchers found that participants generally held positive views of breastfeeding but were uncomfortable seeing it.³⁶ A few implications for further research that Foss and Blake

mentioned was, to measure the effect of seeing up-close videos of breastfeeding and the participants attitude and comfort levels, as well as using a video where the mother breastfeeds without a cover.³⁶ Also, Foss and Blake indicated that a limitation to their study was failure to explore the underlying psychological processes the students went through when viewing these video clips.³⁶

This present research study was adapted from Foss and Blake's³⁶ research techniques and attempted to add in psychological processing by studying participants' explicit and implicit attitudes, by incorporating face reading technology (Noldus FaceReader™). To the researcher's knowledge, no other research studies have incorporated facial expression software to analyze participants' implicit attitudes toward public breastfeeding.

FaceReader

Noldus FaceReader™ technology is a type of facial expression recognition software that analyzes six basic or universal emotions: happy, sad, angry, surprised, scared, and disgusted. Additionally, FaceReader™ can analyze contempt and a participant's neutral state.⁴³ This software is used to interpret facial expressions from participants when exposed to different stimuli, by video recording them in real time. It can also measure gaze direction, head orientation, and personal characteristics, such as, age, ethnicity, gender, and facial hair. At our facility, this software has only been used for sensory analysis of food and beverage products. However, it is capable of many different types of research and has been utilized in educational and scientific studies.^{11, 44-46}

For example, recently FaceReader™ technology was used in a consumer behavior research study that used an implicit and explicit measurement approach of consumers'

facial reactions to flavored orange juice products.⁴⁴ All of the participants tasted the beverages in front of the FaceReader camera, but the implicit group was not informed they were being videotaped. This technique was used in order to capture their unintentional, automatic facial reactions. Conversely, the explicit group was told to rate the product with their facial expressions. Researchers found that both the implicit and explicit measurement techniques showed significant positive correlation between facial expressions elicited by the different samples of orange juice.⁴⁴ Secondly, when used in market research, one study looked at the emotion-induced engagement in internet video advertisements.⁴⁵ Researchers reported how advertisers can leverage emotion and attention to engage consumers in internet ads, by using a controlled experiment to focus on joy and surprise facial expressions.

Lastly, the field of psychology utilized Noldus FaceReader™ with great success, specifically, in conducting research with infants. These psychological studies have used this software in trying to understand more about speech behaviors, motor skills, maternal sensitivity, and learning behaviors of infants.⁴⁶ One specific infant study looked at the relationship between infants' temperament, food acceptance, and mothers' perceptions of their enjoyment of food.¹¹ The researchers found that certain aspects of children's temperament are related to their food acceptance from their mother's facial expressions that they show the infant when feeding them. For example, positive facial expressions such as smiling or raised eyebrows would indicate to the infant that the food they were about to consume was good. Overall, this technology has a wide variety of uses in the realm of psychological research.

Aims and Hypothesis

In this present study FaceReader™ was used to observe participants' implicit attitudes when viewing still images of women breastfeeding in public. As stated previously, the literature of breastfeeding in public has found that, men are more uncomfortable than women to see breastfeeding in public, those who attend religious services frequently are less likely to accept breastfeeding in public due to conservative views, and many people believe women have the right to breastfeed in public but should be covered when doing so. The purpose of this study was:

Aim 1: To observe students' attitudes and beliefs toward the behavior of women breastfeeding in a public place.

- H1a: Positive attitudes for breastfeeding in public will be significantly greater in women than men, and highest in women with children.
- H1b: Being kicked out of a restaurant because of breastfeeding will have more negative attitudes compared to breastfeeding in a public park.

Aim 2: To determine whether students' written (explicit attitude) support of women breastfeeding in public correlates with their facial reaction (implicit attitude).

- H2: Students who attend religious services frequently will show an inverse correlation between explicit and implicit facial reactions.

Aim 3: To determine which level of breast exposure from public breastfeeding makes students most comfortable.

- H3: Students would be most comfortable viewing the image of the woman with the least breast exposure in public.

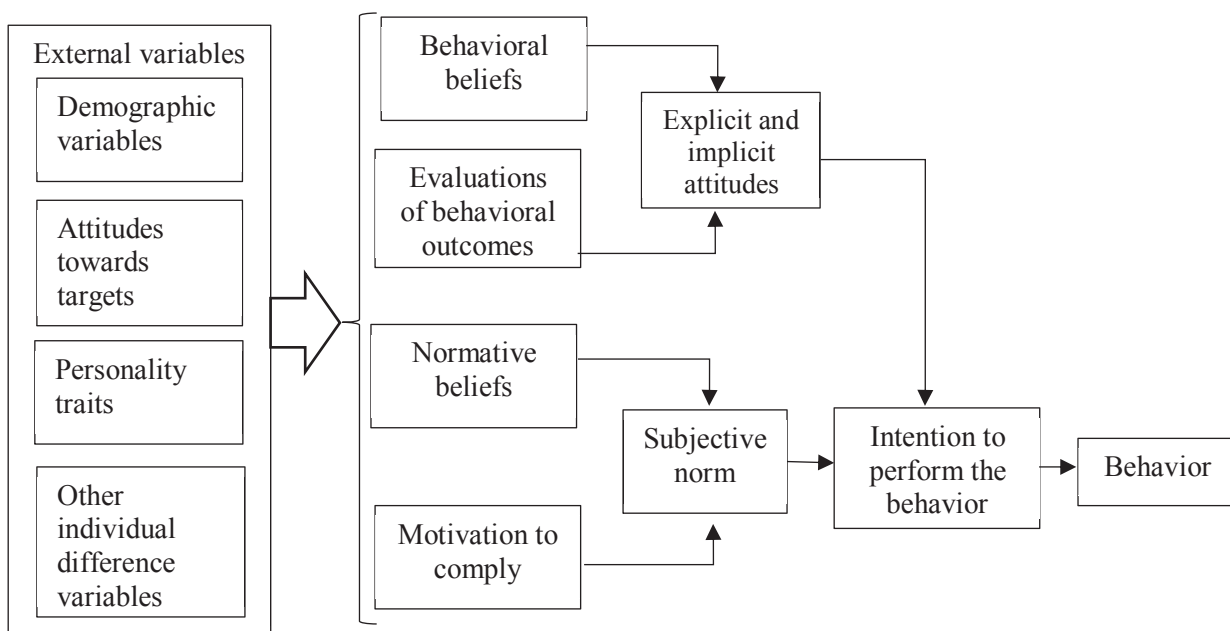
Chapter 2 Theoretical Framework

To try and understand students' attitudes toward women breastfeeding in public this present research study used a combined approach when incorporating theory. It was grounded under the Theory of Reasoned Action and measured explicit and implicit attitudes (Figure 1).

Theory of Reasoned Action

The Theory of Reasoned Action (TRA) was developed in 1980, to offer a conceptual framework to understand human behavior, by social psychologists Martin Fishbein and Icek Ajzen.⁴⁷ This theory is a psychological model that is concerned with behavioral intent created or caused by two factors: attitudes and subjective norms. Psychologists have used the TRA to investigate abnormal behavior and compulsions, how to promote healthy actions, and why individuals participate and misbehave in social groups.⁴⁷

Figure 1. The Theory of Reasoned Action with explicit and implicit attitudes.



The TRA recognizes that there are situations (or factors) that limit the influence of attitude on behavior.⁴⁸ In this study we defined the behavior as, supporting women breastfeeding in public. Per the TRA, the driver of behavior is the intention to perform the behavior. Intention is the cognitive representation of a person's readiness to perform a given behavior and is the most critical precursor of behavior.⁴⁸

The TRA behavioral intentions are driven by a person's subjective norms and attitude towards a behavior. Subjective norms are the perceived social pressures to perform or not perform the behavior.⁴⁸ The social pressure is influenced by one's perception of the beliefs based on their parents, friends, partners, acquaintances, and colleagues. These beliefs play a significant factor in how people are influenced in the way they perceive behavior and views.⁴⁸ For example, a person who was exposed to breastfeeding would be more aware of this behavior and may hold positive attitudes about breastfeeding. However, these positive attitudes all depend on the social group's attitudes and if they were also positive.

To go into further detail, subjective norms have two components, normative beliefs and motivation to comply. Normative beliefs are what the individual believes society expects their views to be and motivation to comply is the importance of this issue to the individual.⁴⁹ However, there are also external variables that can be of influence such as, the individual's demographics, attitudes towards targets, personality traits, and other difference variables.⁴⁹ These external variables can also influence one's beliefs.

Behavioral belief items are casual indicators that illustrate a latent variable and attitude items are ones that reflect the operation of a latent variable.⁴⁹ The TRA considers the behavioral belief and evaluation of behavior outcomes to influence attitudes.

Behavioral beliefs are what the person believes the consequences of the behavior will be.⁴⁷ Evaluation of the outcome refers to the way one perceives and evaluates the potential outcomes of a performed behavior, typically in a binary “good-bad” way.⁵⁰

These beliefs influence the attitude toward the behavior. The TRA explains that to change the ultimate behavior a person would need to consciously look at their underlying attitudes or beliefs that exist and modify them accordingly. Attitudes can be a very complex variable to look at, in this present study we deviated from the traditional TRA model and separated attitudes as explicit and implicit. The attitudes were separated in an effort to make a comparison to each other later on.

Explicit and Implicit Attitudes

In this study, we are using questionnaires to represent participants’ explicit attitudes and FaceReader™ technology for measuring implicit attitudes. The term explicit attitude is defined as an attitude we think about and deliberately report.⁵¹ They are measured by self-report and necessarily involve respondents knowing that their attitudes are being assessed.⁵² On the other hand, the term implicit attitude is used to refer to an attitude that “manifests as actions or judgements that are under the control of automatically activated evaluation without the performer’s awareness of that causation.”⁵³ These unconscious attitudes could stem from preconceived judgements seen at home or when growing up.

Implicit attitudes are more challenging to measure but considerable research has been done on how to do so. For example, Greenwald, McGhee and Schwartz⁵³ developed the Implicit Association Test (IAT) in 1998. This test measures differential association of two target concepts with an attribute, where the two concepts appear in a 2-choice task and

the attribute in a second task.⁵³ This procedure aims to measure implicit attitudes by measuring their underlying automatic evaluations.⁵³ Similarly, Project Implicit, a non-profit organization and international collaboration between researchers developed by Greenwald, Banaji, and Nosek launched the IAT that can be taken online.

The IAT measures strength of associations between concepts and evaluations or stereotypes.⁵³ In order to complete the IAT the participant is asked to quickly sort words into categories that are on the left- and right-hand side of the computer screen. The IAT has five main parts to complete. The first part asks the participant to sort words relating to the concepts into categories, and then sort words relating to the evaluation. In the third part the categories are combined, and the participant is asked to sort both concept and evaluation words. On the fourth part the placement of the concepts switches sides of the computer screen and the number of trials is increased in order to minimize the effects of practice. In the last part all the categories are combined, and the participant is asked to sort the concept and evaluation, as seen in part three, except the pair of categories to evaluate is opposite than before.⁵³

The way the IAT analyzes the participant's score is based on how long it takes them to sort the words in the third part versus the fifth part of the test. The results would show that a person would have an implicit preference if they were faster to categorize words for one category over the other. For example, if the participant associated thin people (category) with good (concept) versus fat people with bad when these categories shared the same response key during the test, then the expected results would be to that the participant has an implicit bias that thin people are good and fat people are bad.⁵³

As mentioned, attitudes are a main focal point for TRA, but researchers have criticized this model for not taking into consideration unconscious behavior choices.⁵⁴ To examine this idea further Ackermann and Palmer, studied the impact of explicit and implicit attitudes on the predictive ability of TRA.⁵⁴ Researchers were able to do this by observing consumers' attitudes towards eating healthy food versus fast food. They used the IAT and compared those scores to self-reported explicit attitude scores. The results showed a disconnect between an individual's implicit and explicit attitudes and that implicit attitudes had no significant effect on behavioral intentions.⁵⁴ The combination of TRA and explicit and implicit attitudes needs further research studies to examine this association more thoroughly.

Chapter 3 Materials and Methods

This study used a cross-sectional study design to examine students' explicit (written) and implicit (facial) attitudes of women breastfeeding in public and observed their current knowledge and beliefs about breastfeeding. Noldus FaceReader™ technology was used to analyze students' facial reactions to three images and one video clip of women breastfeeding in public. A questionnaire was used to determine students' written responses, according to a 5-point Likert scale, to the images and video clip, as well as demographic, belief and, attitude questions. The Institutional Review Board at Montclair State University approved the study protocol.

Participant recruitment

A total of 26 undergraduate and graduate students at a public university in northern New Jersey were recruited to participate in the research study. The student population closely resembles the population of New Jersey with regard to their ethnicities and race, according to the 2010 United States census data (Table 2).^{55,56} The demographics at this university make for an ethnically and racially diverse population to recruit from.

Table 2. New Jersey 2010 census data compared to student population at study university

	NJ (%)	Undergraduate (%)	Graduate (%)
White	59	47	61
Hispanic/Latino	18	29	16
Black/African American	13	13	11
Asian	8	6	5
Two or more races	3	3	1
Female	51	61	71
Male	49	39	29

Recruitment was ongoing from December 2018 until February 2019. Students had to meet the following criteria to participate in the study: currently be enrolled as an undergraduate or graduate student at the university and they had to be at least 18 years old at the time of the study. Also, they could not be enrolled in any of Dr. Dinour's classes, because her students are exposed to breastfeeding information and we did not want a biased population.

The researcher sent emails with a brief description of what the study entailed and the criteria that had to be met to participate via Canvas, the Learning Management System (LMS) used on campus, to reach nutrition undergraduate and graduate students. Efforts were also made to include students pursuing their studies from a variety of majors through professional connections the researchers had. The researcher had directly emailed professors from the public health, exercise science, communications, mathematics, and psychology departments. Recruitment was largely successful from the Nutrition and Food Studies and Public Health Departments.

The nutrition undergraduate students were reached with help from faculty in the Nutrition and Food Studies Department who forwarded the same informational email through Canvas and allowed in-person pleas from the researcher to their students. The researcher also forwarded this email to the food science club and student dietetic organization on campus. Flyers were made and displayed on bulletin boards located throughout the College of Education and Human Services building because this is where the majority of nutrition and public health classes are held and where these students would be. At times, convenience sampling techniques were used to recruit. Students who were sitting in the lounge area outside the lab and in the graduate assistant lounge were asked to

participate. A snowball sampling technique was used to ask students who participated to tell their friends about this opportunity and provided them with flyers.

Lastly, there was an incentive for participants who fully completed the research study. A raffle for two participants to each win a \$25 Amazon gift card was drawn when the study concluded. The incentive was offered to increase the likelihood of student participation. The gift cards were provided from the Nutrition and Food Studies Department.

FaceReader™

As previously mentioned FaceReader™ technology was used to record and analyze facial expressions when participants were exposed to visual stimuli. This study used an Axis webcam model M1054 network camera (Axis Communications AB, Emdalavägen 14, SE-223 69 Lund, Sweden) mounted on the wall and connected to a closed-circuit network to video record participants who provided consent. FaceReader™ software (version 7; Noldus Information Technology, Wageningen, The Netherlands) was used to analyze the video recordings for implicit facial reactions. The software exports numerical data when a certain emotion is present. Each emotion is expressed as a value between 0 and 1 indicating the intensity of the emotion. Zero means that emotion is not visible in the facial expression and one means the emotion is fully present.⁴³

In this study the stimuli were three images and one video clip of women breastfeeding in public. The images and video clip were shown on a Microsoft Surface Pro2 tablet (Windows 10; Pegatron Corporation, Taipei, Taiwan) parallel to the webcam. The FaceReader™ technology is best utilized and can report an accurate facial reading

when participants make direct eye contact with the camera lens. Having the tablet set up parallel to the camera allowed the participants to keep eye contact with the camera as well as view the images and video clip as naturally as they could.

Images

Three images of women breastfeeding on a public park bench were displayed on the tablet. The images represented were of women: covered (Figure 2), partially exposed (Figure 3), and exposed (Figure 4). See appendix A for images. Each image was shown for 15 seconds, and 20 seconds in between each image displayed a white screen and instructions for the participants to fill out the corresponding page of the questionnaire.

Three slideshow variations were made that switched the image viewing order. To try and limit any viewing bias, each participant was randomly assigned a slideshow number that correlated to one of the three variations they would view. The images were found from Google Images, and chosen by the researcher to fit the following criteria: an outdoor setting, sitting on a bench with the woman gazing down at the child, and no other persons were visible in the photograph. The researcher also tried to choose the three photographs to have similar demographics (age, race, and appearance). This set of criteria was established so the main difference between the images was breast exposure, to determine if it plays a factor in public breastfeeding acceptance.

Each image showed the woman and child sitting down and breastfeeding on a public park bench. The woman in each image is Caucasian with dark hair and roughly 20-30 years of age. They are holding and gazing down at the child, who appears to be less than a year old. Having the woman gazing down at the child was considered to eliminate

attractiveness of the woman and child, because their faces could not fully be seen. This also helped the participants solely focus on the action that is happening in the photo. Figure 2 shows the woman with a breastfeeding cover over the child. Figure 3 shows the child breastfeeding without a cover, but no breast exposure. Figure 4 shows the mother breastfeeding with the top of her breast exposed. Table 3 illustrates how the images are categorized by breast exposure and public place.

Breast Exposure	Public Setting	
Exposed	Park Image 3	Restaurant
Partial	Image 2	
Covered	Image 1	Video clip

Video Clip

After the three images were shown to participants, the first 2 minutes and 29 seconds from a popular television series, *Charmed* the “Bare Witch Project” started to play. The video clip shows the main character of the show breastfeeding outdoors at a restaurant. The manager approaches her and asks her to leave because other customers are uncomfortable. She is completely covering the child with a blanket and the child cannot be seen at all.

The video clip was edited by the researcher to fit the present research study. The first minute of the clip was shown without sound for two reasons, first because the conversation was politically charged and could have distracted participants by focusing on the conversation. The second reason was because removing the sound made the participants solely focus the actions of the characters. The second half of the clip showed a restaurant manager come to their table and ask the two main characters to “take that somewhere else.”

This part of the clip had sound to convey the way the manager spoke to the customers and to observe the participants' emotions on how the situation was handled. The video clip is important to the present research study as it shows two different variables; breastfeeding in public and other people's reactions to breastfeeding in public. This particular television series and episode was chosen because it was the same video used in Foss and Blake's³⁶ research study. It also portrayed a scene of a woman being kicked out of a restaurant, that is not typically shown throughout the media and would cause an emotional reaction from the participants.

Questionnaires

The researcher designed a short questionnaire relative to the study. These questions focused on participants' demographics, attitudes, and beliefs about breastfeeding and their emotions after viewing the images and video clip. Participants were asked to answer a series of questions before the study began, after each image, and after the video clip was shown. The questions asked beforehand were focused on demographic questions such as; age, gender, race, ethnicity, education, and marital status. They were also asked if they are a parent and if so they were asked if they or their partner has ever breastfed. A 5-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree) was used for the remaining questions that asked about participants' current knowledge and beliefs regarding breastfeeding and breastfeeding in public. These questions were used from previous research studying attitudes and knowledge of breastfeeding in Australia.⁵⁷ See appendix B for the full questionnaire.

The corresponding questions asked them to rate on the same 5- point scale, how the image made them feel according to the following emotions: happy, sad, scared, angry, disgusted, and surprised. These emotions were used to make a comparison between their implicit facial reactions and their explicit stated responses. The participants repeated this procedure, viewing the image and answering the questionnaire questions two more times for the remaining images. Next, they were instructed to view the video clip for two and half minutes. After the video ended they were prompted to finish the remaining questions.

Data Collection

Participants were seated in a booth located in the food science sensory lab. The booth was designed to meet standards for sensory testing such as proper lighting, room temperature, and noise control. The study took place in this area because the FaceReader™ and Microsoft tablet are also located in the booth. Participants were given the following instructions about the FaceReader™ in order for the camera to properly detect their facial features: remove any hats or glasses, adjust the height of the chair so the camera was eye level and keep eye contact as best as possible while viewing the images/video on the tablet. The entire process from entering the room to leaving, took approximately 10 minutes for each participant.

Data Analysis

Analyzing Data

All statistical analysis was run using IBM SPSS Statistical Software (version 22). A non-parametric Kruskal-Wallis test was used to determine any significant differences between each of the images and the video clip for each of the FaceReader™ (implicit)

emotions (e.g., the FaceReader™ outputs of happy for each of the images and the video were compared for significant differences, etc.; $\alpha= 0.05$). A non-parametric Kruskal-Wallis test was also used to determine any significant differences between each of the images and the video clip for self-reported (explicit) emotions (e.g., the self-reported outputs of happy for each of the images and the video were compared for significant differences, etc.; $\alpha= 0.05$). A Pearson's Correlation test was used to determine any significant relationships between the independent and dependent variables. The independent variables were the demographic, attitude, and knowledge questions. Whereas, the dependent variables were the explicit and implicit attitude emotions: happy, sad, angry, scared, disgusted, and surprised.

Chapter 4 Results

Sample Population

Twenty-six eligible participants were recruited and participated in the research study. The results of three participants were removed because they did not complete the survey correctly, and one who did not provide consent to be video recorded, making our total 22 participants. Of the 22 participants, 16 (72.7%) were female and 6 (27.3%) were male, these percentages are similar to the graduate student population demographics as stated in Table 2. The mean age of the participants was 26 years old (9.02). All 22 participants were students, 14 (63.6%) were undergraduate and 8 (36.4%) were graduate students. In terms of marital status, race, ethnicity, religion, education, and major their results varied (Table 4). Of the five participants who were parents all reported that themselves or their partner had breastfed their child/children.

Table 4. Participants Demographics		
	Mean (SD)	
Age (years)	26 (9.02)	
	Frequency	Percent
Gender		
Female	16	72.7
Male	6	27.3
Marital Status		
Single	19	86.4
Married	3	13.6
Divorced	0	0
Widowed	0	0
Race		
Asian	1	4.5
Black/African American	3	13.4
Native Hawaiian/Pacific Islander	0	0
White	16	72.7
Other	2	9.1
Ethnicity		
Hispanic	5	22.7
Non-Hispanic	17	77.3
How often do you attend religious services? (aside from weddings and funerals)		
More than once a week	2	9.1
Once a week	4	18.2
Once or twice a month	0	0

A few times a year	5	22.7
Never	11	50.0
Education		
High school graduate/ GED	2	9.1
Some college (no degree)	6	27.3
Associate degree	5	22.7
Bachelor's degree	8	36.4
Master's degree	1	4.5
Academic Standing		
Undergraduate	14	63.6
Graduate	8	36.4
Major		
Nutrition & Food Science	17	77.3
Public Health	3	13.6
Other	2	9.1
Are you a parent		
No	17	77.3
Yes	5	22.7

First Aim

The first aim of this study was to observe students' attitudes and beliefs toward the behavior of women breastfeeding in a public place and had a two-part hypothesis.

The first hypothesis: Positive attitudes for breastfeeding in public will be significantly greater in women than men, and highest in women with children. A Pearson's Correlation test (Table 5) showed that men compared to women, had more positive attitudes toward the belief that women have the right to breastfeed in public ($R^2= 0.256$; $p= .016$) and a negative correlation that women breastfeeding in public makes them uncomfortable ($R^2= -0.224$; $p= .036$). Additionally, men had a significant positive correlation that they would encourage their partner to breastfeed in public ($R^2= 0.247$; $p=0.020$) and a significant negative correlation that a woman should not breastfeed in public places. ($R^2= -0.257$; $p=0.015$). It was also determined that for women, having children was not a significant associative factor for any observed attitude.

Table 5. Significant correlations for gender and explicit beliefs.

	BF in public makes me uncomfortable.	A woman has the right to BF in public.	I would encourage my partner to BF in public.	A woman should not BF in public places.
Gender	-.224*	.256*	.247*	-0.257*

BF= Breastfeed/Breastfeeding
 *p<.05

The second hypothesis was that participant’s response to a woman being kicked out of a restaurant because of breastfeeding will have more negative attitudes compared to breastfeeding in a public park. In support of our hypothesis, we found that participants’ explicit (self-reported) response was significantly more negative to the video of breastfeeding in a restaurant than to any of the three images of breastfeeding in a public park ($p < .001$ in all cases). There were no significant differences between any of the four visual stimuli for any of the assessed FaceReader™ outputs (Table 6). Self-reported scared response also showed no significant difference between the three images and video clip (Table 7). For self-reported happy, sad, angry and disgusted there was a significant difference between the video and each still image ($p < .001$ for all three comparisons). Participants’ self-reported happy responses on a 5-point Likert scale (1= strongly disagree and 5=strongly agree) showed an average of 1.68 ± 0.64 to the video and an average response of 3.87 ± 0.83 to image 1, 3.81 ± 0.79 to image 2 and 3.91 ± 0.81 to image 3. The opposite can be seen for self-reported angry response, the video had an average score, on the same 5-point Likert scale of 4.13 ± 0.83 , 1.32 ± 0.57 to image 1, 1.23 ± 0.53 to image 2 and 1.41 ± 0.91 to image 3.

	Happy	Scared	Sad	Angry	Disgusted	Surprise
Image 1	.132 ± .23 A	.009 ± .03 A	.020 ± .04 A	.344 ± .27 A	.124 ± .19 A	.221 ± .26 A
Image 2	.047 ± .07 A	.016 ± .04 A	.013 ± .03 A	.426 ± .34 A	.114 ± .19 A	.264 ± .27 A
Image 3	.039 ± .08 A	.024 ± .06 A	.033 ± .07 A	.373 ± .33 A	.069 ± .12 A	.149 ± .24 A
Video	.038 ± .09 A	.030 ± .06 A	.072 ± .12 A	.411 ± .36 A	.023 ± .06 A	.273 ± .23 A

^a Per reported mean, assessment on a 0-1 scale; 0=absent, 1=fully present
Samples in rows without the same letter are significantly different ($\alpha = 0.05$). Significance determined with Kruskal-Wallis.

	Happy	Scared	Sad	Angry	Disgusted	Surprise
Image 1	3.87 ± .83 A	1.36 ± .72 A	1.59 ± .85 A	1.32 ± .57 A	1.14 ± .35 A	1.81 ± .1.1 A
Image 2	3.81 ± .79 A	1.22 ± .42 A	1.27 ± .70 A	1.23 ± .53 A	1.14 ± .35 A	1.50 ± .67 A
Image 3	3.91 ± .81 A	1.45 ± .91 A	1.41 ± .91 A	1.41 ± .91 A	1.45 ± .78 A	1.95 ± .99 AB
Video	1.68 ± .64 B	1.68 ± .89 A	3.63 ± 1.2 B	4.13 ± .83 B	3.27 ± 1.2 B	2.95 ± 1.4 B

^a Per reported mean, assessment on 5-point Likert scale; 1=strongly disagree, 5=strongly agree
Data in columns without the same letter are not significantly different ($\alpha = 0.05$). Significance determined with Kruskal-Wallis.

Second Aim

The second aim was to determine whether students' explicit written support of women breastfeeding in public correlates with their implicit facial reaction. The hypothesis was: Students who attend religious services more frequently will show an inverse correlation between explicit reporting and implicit facial reactions. No significant correlation was found when comparing explicit and implicit responses.

However, we found a significant positive association between attendance rate of religious service and measures of implicit anger across all stimuli ($R^2 = 0.04$; $p = .007$).

Table 7 shows other significant findings for all visual stimuli. For example, participants that believe breastmilk is the ideal way to feed a baby had a significant negative correlation to self-reported surprised ($R^2 = -0.237$; $p = 0.026$). Additionally, participants who believe breastfeeding provides health benefits for infants that cannot be provided by formula had a significantly negative correlation to self-reported scared response ($R^2 = -0.258$; $p = 0.015$). We also found that, participants who attend religious services frequently and explicit self-reported responses to belief questions were significant (Table 8). For example, these religious participants had a significant negative correlation to the belief that breastmilk is the ideal way to feed a baby ($R^2 = -0.212$; $p < 0.05$). Additionally, these religious participants had a significantly positive correlation to the belief that formula is more convenient than breastfeeding ($R^2 = 0.334$; $p < 0.01$).

Third Aim

The third aim was to determine which level of breast exposure from public breastfeeding makes students most comfortable. The hypothesis was: Students would be most comfortable viewing the image of the woman with the least breast exposure in public. The last question of the questionnaire asked: Which image would you be the most comfortable seeing in public? The mode of all participants' answers showed that figure 1, least breast exposure made students the most comfortable.

Table 7. Significant Correlation Findings for all Stimuli

Predictor	Outcome Variable	Pearson Correlation Coefficient	p-Value
Age ^a	Sad (FR ^b)	.049	.002
	Scared (SR ^c)	.344	.001
Marital Status ^d	Angry (FR)	-.041	.006
	Surprise (SR)	-.237	.026
Breast milk is the ideal way to feed a baby ^b			
Formula feeding is a good way of letting fathers care for the baby ^b	Angry (FR)	.060	.000
Breastfeeding provides health benefits for infants that cannot be provided by formula ^b	Scared (SR)	-.258	.015
Formula is more convenient than breastfeeding ^b	Angry (FR)	.062	.000
	Happy (SR)	-.245	.021
A woman breastfeeding in public makes me feel uncomfortable ^b	Contempt (FR)	.075	.000
	Happy (SR)	-.218	.041
A woman should not breastfeed in public places ^b	Contempt (FR)	.058	.000
A woman breastfeeding in public should be completely covered ^b	Angry (FR)	.039	.010
	Contempt (FR)	.033	.029
It is important to me that I/my partner breastfeeds my child ^b	Disgusted (FR)	-.032	.037
Aside from weddings and funerals how often do you attend religious services? ^b	Angry (FR)	.041	.007

^a: Continuous quantitative variable

^b: SR = Self-Reported; Ordinal scale (1 = strongly disagree, 5 = strongly agree)

^c: FR = Facereader; Continuous quantitative variable (0 = none, 1 = maximum)

^d: Binary term (0 = no, 1 = yes)

Table 8. Significant Correlation of Participants' Religion

	Education	Breastmilk is the ideal way to feed a baby	Formula is a good way for fathers to care for a baby	BF provides health benefits that formula cannot provide	Formula is more convenient than BF	BF in public makes me uncomfortable	A woman BF in public should be completely covered
Religion	-.377**	-.212*	.267*	-.095	.334**	.283**	.404**

BF= Breastfeeding

*p<.05

**p<.01

Chapter 5 Discussion

In this study we found that men were more comfortable seeing women breastfeed in public than women. This is contrary to Stuebe and Bonuck's³⁷ findings, that men were more uncomfortable about public breastfeeding than women were. We can speculate this is because the men surveyed were in the health and nutrition field and view breastfeeding as a health benefit rather than a controversial issue. In addition, our study found that men were also more likely to believe that women have the right to breastfeed in public. Our findings coincide with the United States National Health Styles Survey, which showed a slightly higher acceptance (45.2% vs 41.3%) of men believing women have the right to breastfeed in public than do women.⁵⁷ However, this result could suggest that the men who participated in this study were already accepting of breastfeeding thus the reason why they volunteered for the study to begin with.

Meanwhile, regardless of gender, the average explicit and implicit response of all participants to women being kicked out of a restaurant because of breastfeeding was more negative than to women breastfeeding in a public park. This corresponds with previous research that also found men and women were most uncomfortable with breastfeeding at a restaurant.^{42,43} However, participants' explicit and implicit angry reactions were more prevalent during the second half of the scene from *Charmed*, when the main character is being publicly ridiculed for breastfeeding by the manager. This observation suggests that the anger reported from the video came from how the situation was handled rather than the actual act of breastfeeding in public. This is a positive result because it suggests that the students do not support women being escorted out of public places for feeding their child.

However, it did fail to differentiate if students were comfortable with public breastfeeding in a restaurant setting.

The way breastfeeding is portrayed in the media can be fundamental to the way people form their attitudes on breastfeeding, especially young adults. Given the fact that young adults are frequent users of mass media, a negative media portrayal of breastfeeding could negatively impact their views on breastfeeding.⁵⁸ For example, the strong negative reaction the participants exhibited towards the *Charmed* clip was notable. The clip itself would appear to have been written with sympathy towards an unfair treatment of the breastfeeding parent, presumably in favor of greater societal acceptance. It may well promote greater acceptance, but our data shows that it associates for the viewer the topic of public breastfeeding with negative emotional response. It also conveys its message by depicting the behavior as forbidden and unaccepted. Furthermore, more media messages are needed to highlight the obstacles of breastfeeding in order to shift the responsibility from individual women to society as a whole.³⁶

Also, students' implicit reactions to breastfeeding in the park (all three images) showed predominately positive or neutral emotions. Previous research has also shown people to feel most comfortable when a woman breastfeeds in a public park, suggesting that parks are for young children and families and breastfeeding would be an acceptable behavior in this environment.⁴² This creates a great base for future research to build on because even if the media is showing negative messages about breastfeeding, students' implicit attitudes remain positive.

Additionally, we hypothesized that students who attended religious services frequently would have an inverse correlation between their attitudes. For example,

students' normative beliefs, or what society expects them to believe, would show they support breastfeeding. But, their conservative viewpoints would show their implicit or unconscious attitude would not want to support this behavior. This was not observed, and explicit and implicit attitudes did not differentiate between participants.

However, in one study researchers examined explicit and implicit attitudes toward breastfeeding and artificial feeding and found a difference in participants' attitudes.⁵⁹ Breastfeeding was viewed to be positive and the best form of infant feeding, but there was also an underlying perception that breastfeeding and artificial feeding were equivalent. This suggests that over all, society acknowledges breastfeeding as an acceptable way to feed a child but there are other factors in our unconscious thoughts that hold us back from fully supporting it.⁵⁹

Other noteworthy results were found when explicit and implicit attitudes were compared to the independent variables. For instance, participants who rated breastfeeding to be positive and beneficial also explicitly stated agreement to the negative emotions in response to all three images and the video. For example, those that believed breastmilk is the ideal way to feed a baby explicitly reported that they were not surprised to see a woman breastfeeding in public. Also, participants who believed breastfeeding provides health benefits for infants that cannot be provided by formula explicitly reported that they were not scared by public breastfeeding.

This pattern was also seen for participants' implicit attitudes. For example, those who believed formula is more convenient than breastfeeding showed implicit anger to the images and video through the FaceReader™. Also, participants that believe a woman should not breastfeed in public showed implicit contempt through the FaceReader™, when

exposed to all visual stimuli of women breastfeeding in public. These results are showing opposing viewpoints from the participants, which could suggest a lack of knowledge and acceptance to support women breastfeeding in public.

Lastly, we found students had generally positive attitudes about women breastfeeding, but they were uncomfortable if the woman breastfeeding in public was not covered. This reinforces the main findings from Foss and Blake's³⁶ study that found students supported breastfeeding but were uncomfortable when viewing it.

Additionally, another research study assessed how young adults reacted implicitly and explicitly to viewing breastfeeding images.⁵⁹ They found that while the young adults indicated that their intentions were to breastfeed in the future, they showed an increase in discomfort when viewing the breastfeeding images compared to bottle feeding images. Even though their intent to breastfeed proved to be high, social norms could negatively impact the duration of breastfeeding.⁵⁹ For instance, people may expect that breastfeeding happens only in the privacy of one's home and seeing this behavior in public is perceived negatively outside the home.⁶⁰

This probes the question of why are students most comfortable if a woman is covered while breastfeeding in public? Could it be because breastfeeding is unfamiliar to them? A theory that could help explain this is the mere exposure effect. This theory explains that the more exposure to a behavior there is the more willing a person is to accept it.⁶¹ For example, someone who has seen their friends or family members breastfeed would be more accepting of this behavior because it is familiar to them. Also, if more women chose to breastfeed in public despite society's negative opinions it would expose more

people to this behavior who may not see it otherwise. Thus, the more exposure the more acceptance of the behavior.

Limitations and implications for future research

There were several limitations to this study. First the sample size was predominately white, single, females and was too small to have a true representation of the university. Also, because this study had primarily nutrition and public health students the sample is not representative of all students on campus and their feelings regarding public breastfeeding. In addition, this sample being drawn from health-related studies could have been a biased sample because health educated students could be more aware of the health benefits to breastfeeding. This can be seen in our results that the majority of the participants who volunteered had positive attitudes about breastfeeding.

Additionally, the convenience sampling techniques used in this study created another limitation. To reach a wider range of students from different majors, breastfeeding interventions should be implemented throughout the campus to provide students with more breastfeeding knowledge. Also, these interventions could help expose more students to breastfeeding thus building their acceptance.

Another limitation in this study was the questionnaire developed by the researcher, which was not to scale with the implicit FaceReader™ scale. We suggest future researchers use the foundation of the Implicit Association Test⁵³ to accurately compare explicit to implicit attitudes. Additionally, to measure breastfeeding attitudes and knowledge, The Iowa Infant Feeding Attitude Scale should have been used to have a more representative standard to compare the data to.

The findings from our study set forth a great foundation for future studies. Aside from interventions, future research could implement focus groups, which could help expand the researcher's understanding in further detail as to why these students feel uncomfortable about public breastfeeding. Additionally, research should also go beyond a college campus and look into other communities to gain an understanding of people's attitudes with a wider range of demographics. In an effort to expand the sample population future research studies should try to reach a larger sample of men to receive a more representative result, than our study found.

Furthermore, the facial expression software used in this study added a unique element to this field of research. But, future research studying students' explicit and implicit attitudes through images needs to be addressed. We would suggest using images that cause more of a facial expression to receive more accurate results from the FaceReader™. Overall, change can occur through exposure, education, and empowerment of young adults to allow them to appreciate breastfeeding as a primary health choice.

Chapter 6 Conclusion

The United States' exclusive breastfeeding rates are currently on the rise but are still relatively low for a developed nation. Research has proven that breastmilk and breastfeeding have numerous health benefits for the mother and infant, but our social norms do not fully support a woman to breastfeed her child in public. Although federal laws protect women in the United States to legally breastfeed in public, social norms disapprove of this behavior. This present study observed students' explicit and implicit attitudes of women breastfeeding in public. While there were no differences specifically between participants' explicit and implicit attitudes, we did find that students had more negative attitudes of women being kicked out of a restaurant for breastfeeding than compared to breastfeeding in a public park. Also, students were generally positive towards breastfeeding but felt most comfortable when women were covered while breastfeeding.

Societal support is essential to successful breastfeeding rates, especially for women who choose to breastfeed in public. As the literature has shown that women who feel comfortable breastfeeding in public will breastfeed their child longer. Further knowledge about breastfeeding and the health benefits it has for the parents and infants is needed in order for students to begin to accept and understand breastfeeding. Positive exposure to public breastfeeding can assist to improve students' attitudes toward breastfeeding in public.

Appendix A

Figure 2. Covered



Figure 3. Partially exposed



Figure 4. Exposed



Appendix B

Questionnaire

1. How old were you on January 1, 2018? _____.
2. What is your gender?
 - a. Female
 - b. Male
 - c. Prefer not to answer
3. What is your marital status?
 - a. Single
 - b. Married
 - c. Divorced
 - d. Widowed
4. What is your race?
 - a. Asian
 - b. Black or African American
 - c. Native Hawaiian or Other Pacific Islander
 - d. White
 - e. Other (specify) _____.
5. What is your ethnicity?
 - a. Hispanic
 - b. Non-Hispanic
6. Aside from weddings and funerals, how often do you attend religious services?
 - a. More than once a week
 - b. Once a week
 - c. Once or twice a month
 - d. A few times a year
 - e. Never
 - f. Prefer not to answer

7. What is your highest level of education completed?

- a. High school graduate/ GED
- b. Some college (no degree)
- c. Associate degree
- d. Bachelor's degree
- e. Master's degree

8. What is your role at Montclair State University?

- a. Undergraduate student
- b. Graduate student

9. What is your major?

10. Are you a parent?

- a. No. (Skip to question 12)
- b. Yes.

11. Have you/your partner breastfed your child?

- a. No.
- b. Yes.

What is your agreement level for the following questions?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
12. Breast milk is the ideal way to feed a baby.					
13. Formula feeding is a good way of letting fathers care for the baby.					
14. Breastfeeding provides health benefits for infants that cannot be provided by formula.					
15. Formula is more convenient than breastfeeding.					
16. A woman breastfeeding in public makes me feel uncomfortable.					
17. A women should not breastfeed in public places.					
18. A woman breastfeeding in public should be completely covered.					
19. A woman has the right to breastfeed in public.					

What is your level of agreement with the following questions?

(Choose N/A if you do not plan to have children in the future).

20. It is important to me that I/my partner breastfeeds my child.

a) Strongly Disagree b) Disagree c) Neutral d) Agree. e) Strongly Agree f) N/A

21. I would encourage my partner to/ I would breastfeed in public.

a) Strongly Disagree b) Disagree c) Neutral d) Agree. e) Strongly Agree f) N/A

Image 1	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The image made me feel happy.					
The image made me feel scared.					
The image made me feel sad.					
The image made me feel angry.					
The image disgusted me.					
The image surprised me.					

Image 2	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The image made me feel happy.					
The image made me feel scared.					
The image made me feel sad.					
The image made me feel angry.					
The image disgusted me.					
The image surprised me.					

Image 3	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The image made me feel happy.					
The image made me feel scared.					
The image made me feel sad.					
The image made me feel angry.					
The image disgusted me.					
The image surprised me.					

Video Clip	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The video clip made me feel happy.					
The video clip made me feel scared.					
The video clip made me feel sad.					
The video clip made me feel angry.					
The video clip disgusted me.					
The video clip surprised me.					

1. Have you viewed this episode of *Charmed* Before?

- a. Yes
- b. No
- c. I don't know

2. Do you typically watch television shows like the one shown today?

- a. Yes, always
- b. Often
- c. Sometimes
- d. No, never

After viewing all images/video, what is your agreement level with the following statements?

1. A woman has the right to breastfeed in public.
 - a) Strongly Agree
 - b) Agree
 - c) Neutral
 - d) Disagree
 - e) Strongly Disagree
2. Seeing others uncomfortable about breastfeeding in public made me uncomfortable.
 - a) Strongly Agree
 - b) Agree
 - c) Neutral
 - d) Disagree
 - e) Strongly Disagree
3. After viewing these videos my views towards breastfeeding in public has changed.
 - a) Strongly Agree
 - b) Agree
 - c) Neutral
 - d) Disagree
 - e) Strongly Disagree
4. Which image would you be the most comfortable seeing in public?
 - a) Image 1
 - b) Image 2
 - c) Image 3

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