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Breastfeeding, body image, and weight control behavior among postpartum women

Meghan M. Gillen[a,*], Charlotte H. Markey[b,1], Diane L. Rosenbaum[a,2], Jamie L. Dunaev[b,3]

[a] The Pennsylvania State University, USA
[b] Rutgers University, USA

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ABSTRACT

The goal of this study was to examine breastfeeding behavior and attitudes as predictors of women's body image and weight control behavior. This study extends past research by focusing on positive body image variables including body appreciation and perceived body functionality. Women (N = 597) from the United States who had recently birthed biological babies ages 0–12 months participated in an online study. Current breastfeeding rates were high (86 %), and average breastfeeding duration was approximately 3 months. Women who were currently breastfeeding indicated more positive body images and less likelihood of engaging in maladaptive weight control behaviors than women who were no longer breastfeeding or had never breastfed their baby. Women's positive attitudes toward breastfeeding were associated with awareness and appreciation of body functionality and fewer maladaptive weight control behaviors. These findings extend research on the health benefits of positive body image and suggest that breastfeeding may occur within a constellation of beliefs and behaviors indicative of positive body image.

1. Introduction

Breastmilk is an optimal source of nourishment for infants (Centers for Disease Control [CDC], 2020a). Consequently, breastfeeding is associated with better infant health, including reduced ear and respiratory infections, asthma, and gastrointestinal issues (CDC, 2020a). According to the CDC (2020b), most mothers (83.8 %) in the United States report breastfeeding their babies at some point. Yet, only about 25 % of mothers exclusively breastfeed through 6 months of age, and approximately 33 % of mothers are still breastfeeding at 1 year of age (CDC, 2020c), as per the recommendations of the American Academy of Pediatrics (2012). Thus, many infants are getting some exposure to breastmilk, but likely not as much as would be optimal for them according to medical guidelines. Given this trend, it is important to understand women's experiences with breastfeeding.

Breastfeeding is a physical experience that affects women's bodies. Research indicates that breastfeeding also has an impact on women's thoughts and feelings about their bodies, and sense of identity (Bucher & Spatz, 2019). Thus, the experience of breastfeeding involves not just the biological component of providing nutrition to infants, but also the ways in which women's attitudes and behaviors toward their bodies may affect decisions regarding this behavior. Specifically, what factors are associated with the decision to breastfeed, or to stop breastfeeding? Could positive views about one's body (e.g., positive body image) impact breastfeeding behavior? It may be that the physical process of breastfeeding, as well as psychological factors regarding the body, have important roles in understanding breastfeeding experiences. In the current study, we focused on body image, including facets of positive body image, and weight control behavior as factors that may relate to women's experiences with breastfeeding.

1.1. Breastfeeding behavior

Previous research has focused on the association between negative experiences with body image and breastfeeding. Most of this work has examined body dissatisfaction. Among pregnant women, those who have more body concerns are less likely to ini-

* Corresponding author at: Division of Social Sciences, 1600 Woodland Road, The Pennsylvania State University, Abington, PA, 19001, USA.
E-mail addresses: mmg204@psu.edu (M.M. Gillen), chmarkey@camden.rutgers.edu (C.H. Markey), dlr427@psu.edu (D.L. Rosenbaum), Jamie.Dunaev@camden.rutgers.edu (J.L. Dunaev).
[1] Department of Psychology, Health Sciences Center, Rutgers University, 311 N. 5th Street, Camden, NJ, 08102, USA.
[2] Division of Social Sciences, 1600 Woodland Road, The Pennsylvania State University, Abington, PA, 19001, USA.
[3] Health Sciences Program, Rutgers University, 311 N. 5th St., Camden, NJ, 08102.

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tiate breastfeeding (Morley-Hewitt & Owen, 2019). Women with more body or weight concerns who do breastfeed wean their infants sooner (Brown, Rance, & Warren, 2015; Han & Brewis, 2017; Morley-Hewitt & Owen, 2019). Some women have reported that they are concerned that breastfeeding will alter their breast shape (e.g., cause sagging; Battersby, 2010); those with heightened body concerns may be especially worried about this outcome and therefore avoid or shorten the duration of breastfeeding.

Media promote the idea that with enough effort, women can quickly "bounce back" after pregnancy to a smaller size. Many women report feeling this pressure and are surprised when this "bounce back" does not happen as quickly as expected (Clark, Skouteris, Wertheim, Paxton, & Milgrom, 2009; Roth, Homer, & Fenwick, 2012). The reality of women's experiences is inconsistent with unrealistic Western cultural expectations for women's bodies after pregnancy, so women may feel vulnerable to body concerns during this time. Breastfeeding may help buffer against body concerns during this vulnerable period. Producing milk to nourish one's child can simultaneously be challenging, amazing, and satisfying (Dunaev & Gillen, 2021 in preparation). Women who breastfeed may develop more positive body image knowing that their bodies are capable of producing milk and helping their child develop. Breastfeeding may also engender feelings of pride and accomplishment for what one's body can do, increasing women's focus towards body functionality and decreasing focus on appearance concerns (Schalla, Witcomb, & Haycraft, 2017). Thus, we would expect that women who breastfeed would have more positive body image than those who do not breastfeed.

Breastfeeding may contribute to weight loss in the postpartum period because milk production requires energy and therefore burns calories (Mayo Clinic, 2020; Samano et al., 2013). Although we do not advocate breastfeeding for this purpose or encourage weight loss in all postpartum women, it may decrease the perceived need to engage in restrictive weight control practices for some women. In fact, mothers have identified positive impacts on their eating behaviors from breastfeeding such as more mindful and less restrictive eating habits (Montgomery, Best, Aniello, Phillips, & Hatmaker-Flanigan, 2013; Schalla et al., 2017).

How women feed their infants may relate to their weight concerns. Women with weight concerns may prioritize a quicker initiation of weight loss through dieting to try to regain control over their body size and shape in the postpartum period (Montgomery, Bushee, & Phillips, 2011). Breastfeeding leaves women tied to another being's schedule; when a baby wants to eat a breastfeeding mother is typically unable to eat at the same time. In other words, breastfeeding women are likely to have less control over both their schedules in general and their meals in particular. This may be especially worrisome for women who have weight concerns and desire more control over their bodies, who may instead opt for formula feeding (Hodgkinson, Smith, & Wittkowski, 2014). Calorie restriction, which is a key feature of attempts at weight loss and dieting, can also make breastfeeding more difficult due to nutrient deficiencies and changes in the breastmilk supply (Institute of Medicine Committee on Nutritional Status During Pregnancy & Lactation, 1991). This is particularly true if calorie restriction occurs early in the breastfeeding process (e.g., before a successful pattern of breastfeeding is established) and if the level of restriction is high (Lovelady, 2004). In turn, early restrictive dieting practices may prevent initiation of breastfeeding or contribute to earlier weaning.

Research on postpartum women generally supports a mutually beneficial relationship between women's body image and infant feeding methods (with some exceptions, e.g., Mancini, 2017). For example, in one study, women who breastfed at birth and at 2, 6, and 26 weeks reported lower levels of restricted eating and eating for external reasons (e.g., time of day) as compared to women who formula fed at these times (Brown, 2014). Another study found that women who were breastfeeding at 6–8 weeks postpartum had higher appearance evaluation and body satisfaction and less overweight preoccupation (Swanson, Keely, & Denison, 2017). At 6 months postpartum, not breastfeeding exclusively is associated with higher body dissatisfaction and more disordered eating symptoms (Zimmerman, Rodgers, O'Flynn, & Bourdeau, 2019). Among those who stopped breastfeeding before 6 months, those with more body concerns were more likely to stop breastfeeding because of body image-related reasons: embarrassment about feeding in public and concerns about how breastfeeding would impact their body shape (Brown et al., 2015). Relatedly, in qualitative work, women identified their body image as an important factor that influences their decision to breastfeed in public (Hauck, 2004). At 9 months postpartum, results are similar to those for mothers with younger infants. Those with higher body dissatisfaction are less likely to breastfeed (Gjerdingen et al., 2009). In sum, women who have more body concerns and engage in more weight control behaviors are less likely to breastfeed and if they do breastfeed, engage in it for less time.

1.2. Breastfeeding attitudes

There is also some work on the association between body image and breastfeeding attitudes. Specifically, there is some research on how components of self-objectification (e.g., body shame and surveillance) relate to breastfeeding attitudes. According to objectification theory, self-objectification is a process whereby women learn from the wider culture to evaluate their bodies from an outsider's perspective with an emphasis on how the body looks, rather than how it functions (Fredrickson & Roberts, 1997). This process of body surveillance can lead to feelings of body shame for not meeting cultural standards of attractiveness (Fredrickson & Roberts, 1997). Further, the extent to which women experience *embodiment* more broadly, or how they experience their bodies, are attuned to their bodies, and how they engage in meaningful ways in their sociocultural contexts, is likely relevant to their breastfeeding attitudes (Piran, 2017).

Self-objectification may occur within the context of breastfeeding, particularly because breastfeeding involves women's bodies and potential judgement of self and body surrounding the process. According to objectification theory, women may negatively evaluate the impact of breastfeeding on their appearance. This could increase negative attitudes toward breastfeeding. Research generally supports this contention. For example, college women who engage in more body surveillance and have higher body shame have more shameful attitudes toward breastfeeding and menstruation (Johnston-Robledo, Sheffield, Voigt, & Wilcox-Constantine, 2007). Research conducted among pregnant women found that those with more body concerns have fewer intentions to breastfeed (Morley-Hewitt & Owen, 2019). Pregnant women with more body shame were more worried that breastfeeding would be embarrassing and would negatively impact their bodies and sexuality (Johnston-Robledo & Fred, 2008). Research demonstrates these associations even among women who are currently breastfeeding. That is, those who engage in more body surveillance (and desire weight loss) have lower breastfeeding self-efficacy (Rodgers, O'Flynn, Bourdeau, & Zimmerman, 2018). Thus, it may be that self-objectification does not significantly impact women's decisions to breastfeed, but rather their subjective experiences with breastfeeding especially related to the body and sexuality.

The theoretical principles behind self-objectification, and embodiment in general, may apply not just to the appearance of the body, but also its function. Research supports this idea within the context of breastfeeding. Breastfeeding can be linked to positive thoughts and feelings about the body when women's expectations for breastfeeding are met. For instance, evidence

shows higher body appreciation among breastfeeding compared to bottle feeding women (Fern, Buckley, & Grogan, 2014). However, research also indicates that women whose breastfeeding experiences do not match their expectations have lower levels of appreciation of body functionality and higher levels of depression symptoms (Rosenbaum, Gillen, & Markey, 2020). For example, women may engage in body surveillance as they check their ability to breastfeed correctly or to produce enough milk; if they perceive failure, they may feel ashamed. This is supported by a recent review that identified a theme in the literature that some women believe "good mothers" breastfeed their babies and experience feelings of guilt and failure with breastfeeding difficulties (Da Silva Tanganhito, Bick, & Chang, 2020). This process of self-surveillance and subsequent shame is learned from the wider culture as women internalize the tendency to judge women, including themselves, and this affects their experiences of embodiment more broadly (Fredrickson & Roberts, 1997; Piran, 2017). Although judgments about breastfeeding capabilities mainly surround women's perceptions of body functionality, women (and others) may wonder if perceived breastfeeding failures may reflect women's appearance: are my (her) breasts too small? Too large? Not "right" in some other way? Thus, through self-objectification in breastfeeding, women may become judges of both their body appearance and functionality (Morris, Goldenberg, & Heflick, 2014), and may also develop negative attitudes toward breastfeeding (Beech, Kauffman, & Anderson, 2020).

1.3. Contributions of current study

The current study adds to the literature in several ways. Many studies on body image and breastfeeding have focused on negative aspects of body image (e.g., body dissatisfaction), relying on the framework that poor body image may inhibit breastfeeding. Here, we take a different approach by examining how breastfeeding may be related to multiple positive aspects of body image. Breastfeeding can enhance confidence because of the body's ability to provide milk to nourish a child (Schalla et al., 2017). Thus, women may feel proud and satisfied with their body as a result of breastfeeding (Dunaev & Gillen, 2021, in preparation). Additionally, women who breastfeed have been found to have more favorable views of the functionality of their bodies and greater appreciation for their bodies (Fern et al., 2014). A recent study also found that women whose breastfeeding expectations are met have higher appreciation for the functionality of their bodies (Rosenbaum et al., 2020). The current study builds on these past findings by including multiple measures of body image and also women's weight control behaviors.

Our other measures of body image and eating behavior are also new in this literature. Appearance orientation focuses on investment in appearance. Based on the additional demands of breastfeeding (beyond the other aspects of raising an infant), we would expect that breastfeeding women would be less oriented toward their appearance than women who are not breastfeeding. This may be because women who are currently breastfeeding are less likely to engage in self-objectification, given the positive regard for the body that can occur within the context of perceived breastfeeding success.

Appearance evaluation may also relate to breastfeeding. Women may feel more positively about their appearance when breastfeeding and have more positive attitudes toward the practice as well. Their breasts are part of their overall appearance; feeling positively toward breasts because of their ability to nourish an infant may generalize to positive feelings about one's entire appearance. Breasts are perceived to be an important aspect of women's physical appearance ideals because they are sexualized (Murnen & Don, 2012). Women may not only evaluate their own breasts in terms of how they look but also what they can do (i.e., breastfeed a baby). Previous research demonstrates that women with less breast dissatisfaction also report higher body satisfaction (Frederick, Peplau, & Lever, 2008) suggesting that evaluations of breasts may relate to how women feel about their bodies in general.

Our measure of eating behavior focuses exclusively on unhealthy weight control behavior (e.g., fasting, vomiting). Because breastfeeding women's milk is affected by their diet (Nichols, 2018), they may be more conscious than non-breastfeeding women of eating adequate quality and quantities of food. Thus, they may engage less in unhealthy dieting behaviors. Further, women who are concerned about weight management may be less inclined to maintain a practice – breastfeeding – that physiologically ties them to their babies and may keep them from being able to exercise or eat as they would like to.

1.4. Hypotheses

Based on previous research and theory, we hypothesize:

1 Women who are currently breastfeeding will have more positive body image (higher body appreciation, higher perceived body functionality, higher appearance evaluation, lower appearance orientation) and less unhealthy weight control behavior as compared to women who are not currently breastfeeding.
2 Women who have more positive attitudes toward breastfeeding will have more positive body image (higher body appreciation, higher perceived body functionality, higher appearance evaluation, lower appearance orientation) and less unhealthy weight control behaviors. Among women who are currently breastfeeding, more positive attitudes toward breastfeeding until 12 months of age will be associated with more positive body image and less unhealthy weight control behaviors.

2. Method

2.1. Participants

Women with babies ages 0–12 months were recruited through social media, email, and a university website to participate in a study about "Early Motherhood Health" using the survey tool Qualtrics. Women had to live in the United States, be age 18 or over, and have birthed a baby that is their biological child. Participants were told that the study would take about 45 min to complete. The survey was available for approximately 3 months (August through November). Women's average age was approximately 31 years old and babies' average age was approximately 6 months old (see Table 1). Most women in the sample identified as European American/White (83.9 %), married (89.8 %), heterosexual (96.6 %), and had singleton babies (i.e., one baby rather than multiples such as twins or triplets; 99.0 %). See Table 1 for a detailed breakdown of the demographic characteristics of the sample.

2.2. Procedure

Participants read a recruitment statement online describing the eligibility criteria for the study, duration, and remuneration for participating. If they decided to participate, they completed informed consent and proceeded to a survey on health and feeding experiences in the postpartum period. If women had more than one child, they were asked to report on the experiences they have with their child ages 0–12 months. The postpartum period was defined as "the period of time since your baby was born." Data were carefully screened to remove respondents who reported not meeting the criteria for the study, had duplicate or suspicious responses, and/or a large amount of missing data (i.e., most of the survey was not

Table 1
Demographic Characteristics of the Sample.

	M	*SD*	Range
Women's age (in years)	31.31	4.20	20.79–44.33
Babies' age (in months)	6.57	3.47	0.42–12.97
Number of children	1.85	0.93	1–6
Current BMI	27.15	5.91	17.14–59.27
	%		
Marital status			
Married	89.8		
Cohabiting	7.2		
Remarried	1.2		
Dating a significant other	0.8		
Single	0.7		
Divorced	0.2		
Widowed	0.2		
Race/ethnicity			
European American/White	83.9		
Other	7.4		
Latino American/Hispanic	3.9		
Asian American/Asian/Pacific Islander	3.2		
African American/Black	1.2		
American Indian/Native American/Aleutian or Eskimo	0.5		
Woman has twins			
No	99.0		
Yes	1.0		
Sexual orientation			
Heterosexual	96.6		
Homosexual	0.5		
Bisexual	2.5		
Other	0.3		

Note. BMI = Body mass index.

completed). Of the 1,480 responses received, N = 597 (40 %) were retained. This rate is in line with previous research that indicates that typical ranges for carelessness or insufficient effort responding styles can be up to 40–60 % in online research (Dogan, 2018; Oppenheimer, Meyvis, & Davidenko, 2009). After completing the study, participants received a $10 gift card. This study was approved by Pennsylvania State University's Institutional Review Board.

2.3. Measures

2.3.1. Breastfeeding behavior

Participants were asked if they are currently breastfeeding their baby (*yes* or *no*). They were also asked to indicate how they feed their baby now with 6 response options (1 = *Exclusively breastfed from the breast*, 2 = *Bottle-fed with breastmilk,* 3 = *Fed from the breast and bottle-fed with breastmilk,* 4 = *Fed from the breast and bottle-fed with formula,* 5 = *Fed from the breast and bottle-fed with formula and breastmilk,* 6 = *Exclusively bottle-fed with formula*) These items were modified from Hipp, Kane Low, and van Anders (2012) and acceptable validity and reliability information is available for items assessing breastfeeding behaviors (see Gau, 2004).

2.3.2. Infant feeding attitudes

We used the Iowa Infant Feeding Attitude Scale (de la Mora, Russell, Dungy, Losch, & Dusdieker, 1999) to measure attitudes toward feeding infants. Questions focus on attitudes toward infant feeding, including breastfeeding and bottle-feeding (e.g., "Breastfeeding increases mother-infant bonding.") There are 17 items rated on a 5-point scale (1 = *strong disagreement to* 5 = *strong agreement).* Items were summed to create total scores, with higher scores indicating more positive attitudes toward breastfeeding (M = 66.99, SD = 8.84). Women who are currently and not currently breastfeeding responded to these questions. Reliability in the current study was satisfactory (α = .85) and more extensive information about the reliability and validity of this measure among postpartum women can be found in de la Mora, Russell, Dungy, Losch, and Dusdieker (1999).

2.3.3. Attitudes toward breastfeeding until 12 months

We asked three questions regarding attitudes toward breastfeeding until 12 months of age (i.e., "I am motivated to maintain breastfeeding until my baby is 12 months of age," "I feel that maintaining breastfeeding until my baby is 12 months of age is important," and "I am confident that I can maintain breastfeeding until my baby is 12 months of age"). Responses range from 1 = *not at all* to 5 = *very*. The questions and response options were modified from de Jager et al. (2015). Although these authors used the items individually, we combined them to create a sum total representing attitudes toward breastfeeding until 12 months of age (M = 13.66, SD = 2.47). Only women who were currently breastfeeding answered these questions. Internal consistency reliability for the scale was good (α = .90). Past research suggests that items such as these are predictive of breastfeeding behaviors (e.g., de Jager et al., 2015).

2.3.4. Body appreciation

We used the Body Appreciation Scale-2 to measure appreciation for the body, an aspect of positive body image (Tylka & Wood-Barcalow, 2015a). The measure has 10 items (e.g., "I respect my body) to which participants respond on a 5-point scale (1 = *never* to 5 = *always*). Items are averaged and higher scores represent higher body appreciation. Internal consistency reliability was satisfactory in the current study (α = .94). Past evaluation of this measure indicate that is has good internal consistency reliability (αs = .93–.96) and stability over a 3-week period (r = .90; Tylka & Wood-Barcalow, 2015a). Further, the BAS-2 has been found to be positively associated with measures including self-esteem and proactive coping and negatively associated with body dissatisfaction, internalization of societal appearance ideals, and body surveillance (Tylka & Wood-Barcalow, 2015a).

2.3.5. Body functionality awareness and appreciation

This measure assesses women's Awareness of Body Functionality (6 items; "I have felt it is important to understand how my body works"), and their Appreciation of Body Functionality (5 items; "I have been amazed by what my body is capable of doing"; Rubin & Steinberg, 2011). Responses are on a 1 = *strongly disagree* to 5 = *strongly agree* scale. Item responses are summed with higher scores indicate greater awareness of body functionality and greater appreciation of body functionality, respectively. The measure was originally used among pregnant women, but we modified the instructions so that participants were asked to think about their thoughts and feelings during the postpartum period. Internal consistency reliability for both Awareness of Body Functionality (α = .85) and Appreciation of Body Functionality (α = .71) were satisfactory in this sample and consistent with internal consistency reliability found among similar samples (e.g., pregnant women; Rubin & Steinberg, 2011).

2.3.6. Appearance orientation and evaluation

We used two subscales from the Multidimensional Body-Self Relations Questionnaire (MBSRQ; Brown, Cash, & Mikulka, 1990; Cash, 2000). Appearance Orientation captures the level of cognitive and behavioral investment in appearance, and has 12 items, which are averaged to create subscale scores (e.g., "I check my appearance in a mirror whenever I can"). Appearance Evaluation assesses evaluation of overall appearance (e.g., "Most people would consider me good-looking"), and has 7 items, which are averaged to create subscale scores. Responses to both subscales are rated on a 5-point scale (1 = *definitely disagree* to 5 = *definitely agree*). Higher scores indicate greater orientation toward appearance and more positive

Table 2
Differences in Body Image and Unhealthy Weight Control Behavior by Breastfeeding Status.

Variable	Currently breastfeeding *M* (*SD*)	Not currently breastfeeding *M* (*SD*)	*t*	*p*	*d*
Body Appreciation	3.52 (0.71)	3.29 (0.80)	−2.61	.009	0.30
Awareness of Body Functionality	23.98 (3.43)	22.47 (4.10)	−3.57	<.001	0.40
Appreciation of Body Functionality	19.27 (0.13)	17.66 (0.33)	−4.57	<.001	0.55
Appearance Orientation	3.13 (0.61)	3.29 (0.62)	2.11	.035	0.26
Appearance Evaluation	3.08 (0.87)	2.70 (0.85)	−3.68	<.001	0.44
Unhealthy Weight Control Behavior	9.56 (1.79)	10.44 (2.25)	3.89	<.001	0.43

Note. Women who were currently breastfeeding = 86 % of the sample (*N* = 499) versus women not currently breastfeeding (*N* = 98).

Table 3
Correlations among Breastfeeding Attitudes, Body Image, and Unhealthy Weight Control Behavior Among All Women.

Variables	1	2	3	4	5	6	7
1 Infant Feeding Attitudes	–						
2 Body Appreciation	−.02	–					
3 Awareness of Body Functionality	.25**	.41**	–				
4 Appreciation of Body Functionality	.26**	.53**	.56**	–			
5 Appearance Orientation	−.03	−.03	.05	−.01	–		
6 Appearance Evaluation	−.00	.80**	.35**	.51**	−.02	–	
7 Unhealthy Weight Control Behavior	−.31**	−.12**	−.14**	−.15**	.03	−.11**	–

Note. *p < .05, **p < .01, ***p < .001.

evaluations of appearance, respectively. Internal consistency reliability scores for both subscales are satisfactory in the current study (Appearance orientation, α = .85; Appearance evaluation, α = .91). Item scores on these subscales have also demonstrated acceptable internal consistency and construct validity among adult women in the U.S. The MBSRQ has been used extensively for 30 years; additional information about this measure is available in Thompson and Schaefer (2019).

2.3.7. Weight control behavior

We used the unhealthy weight control behavior subscale from the Weight Control Behavior Scale (French, Perry, Leon, & Fulkerson, 1995) to measure unhealthy weight control behaviors. This subscale has 9 items rated on a 3-point scale (0 = *never*, 1 = *sometimes*, 2 = *always*). Items include behaviors such as "skip meals," "fast," and "diet pills." Items were summed, with higher scores indicating more frequent engagement in unhealthy weight control behaviors. Internal consistency reliability was satisfactory (α = .89). In past research, the reliability of this scale and its correlation with relevant constructs (e.g., BMI, weight concerns) in expected directions has been established (e.g., Markey, August, Gillen, & Dunaev, 2020).

2.3.8. Demographics and covariates

Participants self-reported age, infant's age, race/ethnicity, marital status, number of children, height and weight pre-pregnancy, current height and weight, and sexual orientation, as part of the survey. For analytical purposes, race/ethnicity was dichotomized into White vs. non-White. Body mass index (BMI) was calculated using the standard formula provided by the CDC (CDC, 2020d). Please refer to Table 1 for full demographic information for the sample.

3. Results

Most women (86 %) were currently breastfeeding. Nearly all participating women (97.3 %) reported that they had ever breastfed their child. On average, women reported breastfeeding their child for 3 months and 1 week. Some women reported exclusively breastfeeding (37.6 %), some fed their child breastmilk but using bottles (3.2 %), some both breastfed and fed their child breastmilk in bottles (33.7 %), some breastfed and fed their child formula using bottles (3.4 %), some breastfed and fed their child both breastmilk and formula in bottles (7.7 %), and some exclusively fed their child formula (14.4 %).

3.1. Hypothesis 1: breastfeeding behavior

To address our first hypothesis that women who are currently breastfeeding will have more positive body image and less unhealthy weight control behavior as compared to women who are not currently breastfeeding, we performed *t*-tests (see Table 2). Women who were currently breastfeeding had higher body appreciation, rated both their appreciation and awareness of body functionality higher, and had higher appearance evaluation. Their appearance orientation and tendency to engage in maladaptive weight control behaviors were significantly lower. Per Cohen's (1988) conventions for interpretation of the *d* effect size (i.e., small: .20, medium: .50, large: .80), all effect sizes were small (Cohen's *d*s < .50) with the exception of appreciation of body functionality, which was medium (Cohen's *d* = .55).

3.2. Hypothesis 2: breastfeeding attitudes

To address our second hypothesis that women who have more positive attitudes toward breastfeeding will have more positive body image and less unhealthy weight control behavior, we performed correlations (see Table 3). Positive attitudes toward breastfeeding were positively associated with awareness and appreciation of body functionality. Further, positive attitudes towards breastfeeding were negatively associated with maladaptive weight control behaviors. Positive attitudes towards breastfeeding were not significantly associated with body appreciation, appearance orientation, or appearance evaluation.

Among women who were currently breastfeeding, those who reported more positive attitudes toward breastfeeding until 12 months of age also reported higher awareness and appreciation of body functionality and fewer maladaptive weight control behaviors (see Table 4).

Next, we performed ten simultaneous regressions to examine associations among variables in a multivariate context. We entered race/ethnicity (European American/White = 1, all other racial/ethnic groups = 0), current BMI, child's age, and women's age as control variables. Previous literature indicates that there are differences in breastfeeding rates by age, race/ethnicity and BMI, and breastfeeding rates decline through the first year of infants' lives (CDC, 2020b; McKinney et al., 2016; Swanson et al., 2017; Zimmerman et al., 2019), suggesting the importance of including these variables as controls. Then, we entered the breastfeeding atti-

Table 4
Correlations among Attitudes Toward Breastfeeding Until 12 Months, Body Image, and Unhealthy Weight Control Behavior Among Women Currently Breastfeeding.

Variables	1	2	3	4	5	6	7
1 Attitudes toward breastfeeding until 12 months	–						
2 Body Appreciation	−.05	–					
3 Awareness of Body Functionality	.16**	.39**	–				
4 Appreciation of Body Functionality	.18**	.52**	.58**	–			
5 Appearance Orientation	−.01	−.07	.04	.01	–		
6 Appearance Evaluation	−.07	.80**	.32**	.49**	−.03	–	
7 Unhealthy Weight Control Behavior	−.11*	−.04	−.08	−.09	.04	−.06	–

Note. *$p < .05$, **$p < .01$.

Table 5
Regression Analyses Predicting Women's Eating/ Body Image from Infant Feeding Attitudes.

	Unhealthy Weight Control[a]				Awareness Body Functionality[b]				Appreciation Body Functionality[c]				Appearance Orientation[d]				Appearance Evaluation[e]			
	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*
Control Variables																				
Race/ethnicity	−.42	.20	−.09	**.04**	−.14	.41	−.02	.73	−.31	.33	−.04	.36	-.09	.07	−.05	.22	−.29	.09	−.12	**<.001**
Women's age	−.06	.02	−.14	**<.001**	.07	.04	.08	**.05**	.002	.03	.00	.94	−.02	.01	−.15	**<.001**	.02	.01	.07	.05
Child's age	.04	.02	.07	.07	.03	.04	.03	.46	−.02	.04	−.02	.66	−.02	.01	−.10	**.02**	−.01	.01	−.05	.18
Women's BMI (currently)	−.006	.01	−.02	.65	−.07	.03	−.12	**.004**	−.11	.02	−.23	**<.001**	.003	.00	.03	.50	−.07	.01	−.48	**<.001**
Infant feeding attitudes	−.06	.008	−.30	**<.001**	.10	.02	.24	**<.001**	.09	.01	.26	**<.001**	−.001	.00	−.02	.69	.00	.00	−.00	.97

[a] $F(5, 530) = 15.38$, $R = .36$, Adjusted $R^2 = .12$, $p < .001$.
[b] $F(5, 534) = 9.54$, $R = .29$, Adjusted $R^2 = .07$, $p < .001$.
[c] $F(5, 532) = 14.95$, $R = .35$, Adjusted $R^2 = .12$, $p < .001$.
[d] $F(5, 535) = 3.99$, $R = .19$, Adjusted $R^2 = .03$, $p = .001$.
[e] $F(5, 532) = 34.19$, $R = .49$, Adjusted $R^2 = .24$, $p < .001$.

Table 6
Regression Analyses Predicting Women's Eating/ Body Image from Attitudes Toward Breastfeeding Until 12 Months.

	Unhealthy Weight Control[a]				Awareness Body Functionality[b]				Appreciation Body Functionality[c]				Appearance Orientation[d]				Appearance Evaluation[e]			
	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*	B	SE	β	*p*
Control Variables																				
Race/ethnicity	−.51	.23	−.10	.03	.29	.44	.03	.51	.02	.36	.00	.95	−.13	.08	−.08	.09	−.26	.10	−.11	**<.01**
Women's age	−.05	.02	−.12	**<.01**	.05	.04	.06	.24	.01	.03	.02	.72	−.02	.01	−.16	**<.001**	.01	.01	.06	.17
Child's age	.03	.03	.05	.33	.00	.05	.00	.99	−.04	.04	−.05	.31	−.02	.01	−.11	**.03**	−.01	.01	−.04	.30
Women's BMI (currently)	−.01	.01	−.02	.69	−.06	.03	−.09	**.04**	−.11	.02	−.22	**<.001**	.00	.01	.04	.38	−.08	.01	−.51	**<.001**
Attitudes toward breastfeeding until 12 months	−.09	.04	−.13	**<.01**	.23	.07	.17	**<.001**	.23	.06	.20	**<.001**	.01	.01	.03	.61	−.01	.02	−.03	.55

[a] $F(5, 450) = 4.26$, $R = .21$, Adjusted $R^2 = .04$, $p = .001$.
[b] $F(5, 454) = 3.75$, $R = .20$, Adjusted $R^2 = .03$, $p = .002$.
[c] $F(5, 454) = 8.26$ $R = .29$, Adjusted $R^2 = .07$, $p < .001$.
[d] $F(5, 457) = 4.19$, $R = .20$, Adjusted $R^2 = .03$, $p = .001$.
[e] $F(5, 453) = 32.90$, $R = .52$, Adjusted $R^2 = .26$, $p < .001$.

tudes constructs. In the first set of five regressions, infant feeding attitudes was a predictor (for all women). In the second set of five regressions, attitudes toward breastfeeding until 12 months was a predictor (for women currently breastfeeding).

The results of the first set of regressions revealed that, even after controlling for women's race/ethnicity, age, BMI, and their children's age, their infant feeding attitudes predicted their unhealthy weight control behaviors, body functionality awareness and body functionality appreciation. In other words, women with more positive attitudes toward breastfeeding were less likely to engage in unhealthy weight control behaviors and more likely to feel positively about their body functionality. All of these models were significant ($p < .01$) with adjusted R squares ranging from .03 to .24 (see Table 5). Appearance evaluation and appearance orientation were not significantly related to infant feeding attitudes.

For the second set of regressions with attitudes toward breastfeeding until 12 months as the predictor ($N = 455$), we included only women who were currently breastfeeding. In these models, unhealthy weight control behavior and both body functionality variables were associated with breastfeeding attitudes even after controlling for women's race/ethnicity, age, BMI and child's age. In other words, women with greater motivation to breastfeed for 12 months were less likely to report participating in unhealthy weight control behaviors and more likely to report appreciation for and awareness of body functionality (adjusted R squares range from .03 to .26; see Table 6). Appearance orientation and evaluation were not significantly related to attitudes toward breastfeeding until 12 months.

4. Discussion

This study focused on body image and unhealthy weight control behavior as factors that may relate to breastfeeding attitudes and behaviors. Breastfeeding can be thought of as behaviorally consistent with several of the tenets of Tylka and Wood-Barcalow's (2015b) definition of positive body image such as appreciating the functional nature of one's body, and accepting aspects of the body that may be at odds with Western ideals (e.g., breastmilk leakage).

The developmental theory of embodiment suggests that the extent to which women experience *embodiment* and are attuned

to their bodies is likely relevant to their breastfeeding attitudes (Piran, 2017). Additionally, breastfeeding may provide a source of pride and satisfaction for women, suggesting that this behavior may be linked with positive attitudes and behaviors toward the body. Thus, our goal in this research was to consider the ways in which women's breastfeeding attitudes and behaviors were related to multiple aspects of body image – both appearance concerns and positive body image.

Our pattern of results suggest that awareness and appreciation of bodily functionality are the aspects of body image that are most relevant to breastfeeding experiences and attitudes. Infant feeding attitudes among all participants, and attitudes toward breastfeeding to 12 months among those who were currently breastfeeding, were significantly related to awareness and appreciation of body functionality. This suggests that the more favorably women view breastfeeding and the more positive currently breastfeeding women feel about breastfeeding until 12 months, the greater value and respect women hold for their bodies' abilities, even after controlling for demographic variables. Breastfeeding may engender feelings of pride and satisfaction in the body for its ability to nourish an infant, and may feel like a reflection of how well their body functions. This may be particularly relevant for women who are currently breastfeeding and hope to continue until 12 months. For these women, breastfeeding is likely going well and therefore their body is functioning as expected.

We also found that women who were currently breastfeeding had not just higher awareness and appreciation of bodily functionality, but also higher appreciation for their bodies overall, rated themselves as more satisfied with their appearance, and placed less importance on their appearance in comparison to women who were not currently breastfeeding. This is consistent with previous literature that found that women experience pride about their bodies as a result of breastfeeding (Dunaev & Gillen, 2021, in preparation; Schalla et al., 2017).

Consistent with the relationships described above, breastfeeding can be interpreted as a behavior associated with lower self-objectification. Our data support the notion that breastfeeding women may be less vulnerable to negatively judging their bodies on aesthetics. Rather, they appear more likely to notice and value the ways in which their bodies function or the ways in which they experience them. Specifically, our findings pertaining to the relative importance of body functionality can be taken to mean that breastfeeding women evaluate and appreciate their bodies based on what is happening from within, as opposed to focusing on how it may look to an outsider. As such, one interpretation of these data is that the process of breastfeeding could buffer against self-objectification, and foster positive embodiment.

Breastfeeding and positive body image may be mutually reinforcing, as women may be attuned to the love and respect they feel for their bodies while breastfeeding, and reciprocally, those experiences may strengthen women's commitment to breastfeeding. From a young age, women may receive multiple, conflicting, societal messages that encourage them to both adhere to, and resist, norms around appearance and femininity (Velding, 2014). We did not find a significant relationship between attitudes toward breastfeeding and appearance attitudes, despite finding that currently breastfeeding women had greater appearance satisfaction, and placed less value on their appearance. This suggests that the beliefs that women hold about breastfeeding may not impact appearance-related evaluations, but rather that breastfeeding behaviors may promote appearance satisfaction and less investment in appearance. For some, breastfeeding may be considered a positive, or freeing, experience for those who find appearance investment a burden that they shoulder as a result of cultural norms that suggest women's value is tied to their appearance (Ramati-Ziber, Shnabel, & Glick, 2019; Wolf, 1990). Conceptually, positive body image is thought to be comprised of many components, and protective (Tylka & Wood-Barcalow, 2015b). This study extends the notion that positive body image may not only be protective to mental health, but also to behaviors such as breastfeeding that impact both a woman and her child.

We also found that currently breastfeeding women engaged in less unhealthy weight control behavior, compared to women who were not breastfeeding. More positive attitudes toward breastfeeding were also related to fewer unhealthy weight control behaviors. This suggests that those who feel more positively about breastfeeding, including breastfeeding through 12 months, may prioritize the breastfeeding experience over weight control behaviors that could be perceived as jeopardizing the quality or quantity of breastmilk.

This study is novel in its inclusion of an array of instruments to assesses both our predictor and criterion variables including both positive and negative aspects of body image. Previous research has typically included fewer dimensions of body image, often focusing on body dissatisfaction. Additionally, we assessed breastfeeding attitudes in addition to breastfeeding behaviors. This allowed for a more thorough understanding of the relationship between our variables of interest and breastfeeding. That is, measuring breastfeeding attitudes allowed for distinction between attitudes toward the practice and engagement in it.

This study was not without its limitations. First, given the cross-sectional nature of the study design, we were not able to examine temporal relationships between our variables of interest. For instance, although we found current breastfeeding was related to some positive aspects of body image, we are unable to determine conclusively whether current breastfeeding led to positive body image, or if those with positive body image were more likely to maintain breastfeeding. We did not evaluate the processes or mechanisms through which our variables were related. Additional study of intervening variables and/or qualitative data collection to identify thematic links is warranted. Women were also assessed at different points postpartum (within 0–12 months of birth) so their body image, body size, and breastfeeding experiences may have been inherently different. Assessing women at the same time postpartum (e.g., 6 months) may help address this limitation.

Future research is warranted to follow-up on our findings. Specifically, given that breastfeeding behaviors differ across racial and ethnic backgrounds (Li et al., 2019; McKinney et al., 2016), it is important for future research to examine whether our findings may be replicated in a more diverse sample. We dichotomized race/ethnicity due to the minority of participants who did not conceptualize themselves as European American/White, but this is not an optimal or complete approach to considering race/ethnicity. Future research should also take care to investigate more diverse samples in terms of socioeconomic status and women's employment, as these factors are often associated with new mothers' breastfeeding trajectories. Since the current study demonstrated that beliefs and behaviors toward breastfeeding were associated with some positive aspects of body image, the next step is to determine whether increasing the salience of positive body image in postpartum women may promote higher breastfeeding rates and/or extend the duration of breastfeeding for women who are interested in this option. In particular, implementation and evaluation of body positivity programs through clinical research may be beneficial for women postpartum.

In conclusion, awareness and appreciation of bodily functionality appear to be important aspects of body image that relate to positive attitudes and breastfeeding behaviors. Positive attitudes toward breastfeeding, including breastfeeding until 12 months, and current breastfeeding status are also linked to fewer unhealthy weight control behaviors, suggesting that breastfeeding may occur within a constellation of beliefs and behaviors indicative of healthy body image. Additional research is needed to further examine the

impact of awareness and appreciation of bodily functionality on maternal mental health and health behaviors. However, our findings suggest that promoting women's positive body image during the postpartum period may be conducive to positive breastfeeding experiences. For example, interventions that aim to improve postpartum women's positive body image, especially a focus on their awareness and appreciation of bodily functionality, may not only improve women's body image but also their likelihood of sustained breastfeeding. Supporting women in efforts to engage in self-care postpartum, including the consumption of nutritious food and the avoidance of maladaptive weight loss behaviors, may also be relevant to women's ability to maintain a positive body image and engage in breastfeeding their infants.

Author contributions

Meghan M. Gillen: Conceptualization, Methodology, Formal Analysis, Investigation, Data Curation, Writing- Original Draft, Funding Acquisition. **Charlotte H. Markey:** Formal Analysis, Data Curation, Writing- Original Draft. **Diane L. Rosenbaum:** Writing- Original Draft. **Jamie L. Dunaev:** Data Curation, Writing- Review & Editing.

Declaration of Competing Interest

The authors report no declarations of interest.

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