

Northumbria Research Link

Citation: Shepherd, Lee, Walbey, Cherokee and Lovell, Brian (2017) The role of social-cognitive and emotional factors on exclusive breastfeeding duration. *Journal of Human Lactation*, 33 (3). pp. 606-613. ISSN 0890-3344

Published by: SAGE

URL: <https://doi.org/10.1177/0890334417708187>
<<https://doi.org/10.1177/0890334417708187>>

This version was downloaded from Northumbria Research Link:
<http://nrl.northumbria.ac.uk/id/eprint/30631/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)



**Northumbria
University**
NEWCASTLE



UniversityLibrary

Running Header: SELF-CONSCIOUS EMOTION BREASTFEEDING

The role of social-cognitive and emotional factors on exclusive breastfeeding duration

Lee Shepherd BSc MSc PhD, Department of Psychology, Northumbria University

Cherokee Walbey, Department of Psychology, Northumbria University

Brian Lovell BSc PgDip PhD, Department of Psychology, Northumbria University

Word count: 3,456

Corresponding author:

Lee Shepherd, Department of Psychology, Northumbria University, Northumberland

Building, Northumberland Road, Newcastle upon Tyne, NE1 8ST, UK.

Email: Lee.Shepherd@northumbria.ac.uk

Abstract

Background: Previous research has suggested that exclusive breastfeeding is likely to be predicted by social-cognitive variables and fear. However, there is little research assessing the role of regret and self-conscious emotions (e.g., pride and guilt) in promoting exclusive breastfeeding.

Research Aim: The primary aim of this research was to determine whether social-cognitive variables, fear, regret, and self-conscious emotions predict exclusive breastfeeding duration. The secondary aim of this research was to assess whether these factors predict infant feeding choice (i.e., exclusively breastfed, combination fed, or generally formula-fed).

Methods: In this non-experimental one-group self-report survey, 375 mothers rated social-cognitive variables toward breastfeeding (attitude, subjective norm, perceived control and self-efficacy), their fear towards inadequate nutrition from breastfeeding and breastfeeding damaging their physical appearance, and the extent to which mothers may feel pride towards breastfeeding, and negative self-conscious emotions (guilt and shame) and regret for not breastfeeding their infant.

Results: Exclusive breastfeeding duration was positively predicted by self-efficacy, pride, and regret, but negatively predicted by the fear towards inadequate nutrition. We also found that in contrast to exclusive breastfeeding, generally formula feeding an infant was associated with lower self-efficacy, pride, regret, but higher subjective norm and fear towards inadequate nutrition through breastfeeding.

Conclusions: We argue that it is important to consider the role of self-conscious emotions and regret on exclusive breastfeeding.

Background

Given that human milk provides infants with the nutrients they need for healthy development, it is recommended that infants only receive human milk (i.e., are exclusively breastfed) from 0-6 months (World Health Organization, 2016). Despite this, many parents do not exclusively breastfeed their infant. Indeed, in the UK only 23% of mothers exclusively breastfeed their infant by 6 weeks and this drastically declined by 6 months (McAndrew, Thompson, Fellows, Large, Speed, & Renfrew, 2012). Similar rates are found in other European countries (World Health Organization, 2015). Therefore, it is important to assess the factors that promote and deter exclusive breastfeeding. Traditional theoretical models (e.g., Theory of Planned Behavior; Ajzen, 1991) suggest that health behaviors are likely to be determined by logical social-cognitive factors. However, it is also important to account for the role of emotions on health behaviors (Conner and Armitage, 1998; Hofmann, Friese, & Strack, 2009; Sniehotta, Priesseu, & Araújo-Soares, 2013). Therefore, the aim of this research was to assess the extent to which exclusive breastfeeding is predicted by social-cognitive and emotional factors.

Social cognitive and emotional factors

Social cognitive factors are the individual's cognitions and thoughts towards an action. The theory of planned behavior (Ajzen, 1991) suggests that behavior is predicted by three social cognitive factors: the attitude towards the action (attitude), the belief that others support the action (subjective norm), and the perceived control over undertaking the action (perceived control). Similarly, Armitage and Conner (1999) suggest another important social-cognitive variable is the perceived ability to undertake the action (i.e., self-efficacy). In line with this, breastfeeding is predicted by attitude (Manstead, Proffitt, & Smart, 1983), subjective norm (Bai, Wunderlich, & Fly, 2011), perceived control (Dodgson, Henly, Duckett, & Tarrant, 2003; McMillan et al., 2008), and self-efficacy (Blyth, Creedy, Dennis,

Moyle, Pratt, & De Vries, 2002; de Jager, Broadbent, Fuller-Tyszkiewicz, Nagle, McPhie, & Skouteris, 2015; de Jager, Broadbent, Fuller-Tyszkiewicz, & Skouteris, 2014). Moreover, interventions based on these social-cognitive factors have been found to increase breastfeeding intentions (Giles et al., 2014). This suggests that the social-cognitive factors proposed by the theory of planned behavior and extensions of this model (i.e., self-efficacy) are likely to predict exclusive breastfeeding. As such, these four variables (henceforth referred to as social-cognitive variables) were assessed in this research.

Although these social-cognitive variables are important, breastfeeding is closely associated with emotions (Faircloth, 2013; Lawton, Ashley, Dawson, Waiblinger, & Conner, 2012). Researchers often focus on the role of emotions in deterring beneficial health behaviors. Indeed, research has found that women may be unlikely to breastfeed if they fear that the infant may not receive adequate nutrition (Brown, Raynor, & Lee, 2011; Williamson, Leeming, Lyttle, & Johnson, 2012) or that breastfeeding may damage their physical appearance (Hannon, Willis, Bishop-Townsend, Martinez, & Scrimshaw, 2000; Nabulsi, 2011). However, research has suggested that some, more complex, emotions (e.g., pride, regret, guilt, and shame) may serve a self-regulatory role and thus promote beneficial behaviors (Giner-Sorolla, 2001; Van der Schalk, Bruder, & Manstead, 2012). As such, it is important also to consider the role of these emotions on health behaviors, such as exclusive breastfeeding.

Pride, guilt and shame are felt following an evaluation of the self-concept and are thus regarded as self-conscious emotions (Lewis, 1995). People are likely to feel pride when they evaluate themselves positively and negative self-conscious emotions (e.g., guilt and shame) when they evaluate themselves negatively (Tangney & Dearing, 2002; Tracy & Robins, 2004). Regret is felt when people think that they would be in a better situation if they had acted differently (Zeelenberg & Pieters, 2007). Regret is often felt for intrapersonal rather

than interpersonal harm (Berndsen, van der Pligt, Doosje, & Manstead, 2004), and is therefore not generally regarded as a self-conscious emotion. Importantly, research has found that mothers may feel pride for breastfeeding their child (Diaz Meneses, 2013; Swanson, Nicol, McInnes, Cheyne, Mactier, & Callander, 2012; Tarrant, Dodgson, & Choi, 2004), but feel regret and negative self-conscious emotions if they do not breastfeed (Guyer, Millward, & Berger, 2012; Ryan, Bissell, & Alexander, 2010; Ryan, Todres, & Alexander, 2011; Thomson, Ebisch-Burton, & Flacking, 2015).

These emotions are likely to self-regulate behavior (Giner-Sorolla, 2001; Van der Schalk, Kuppens, Bruder, & Manstead, 2015). The desire to feel positive (e.g., pride) and avoid negative emotions (e.g., guilt, shame and regret) is likely to motivate people to maintain long-term goals (Baumeister, Vohs, DeWall, & Zhang, 2007; Zeelenberg & Pieters, 2007), such as exclusive breastfeeding. Indeed, these emotions are likely to predict a variety of health behaviors, such as fruit consumption (Onwezen, Bartels, & Antonides, 2014), screening (Sandberg & Conner, 2009), and exercising (Mack, Kouali, Gilchrist, & Sabiston, 2015). However, there has been little quantitative research assessing the extent to which these emotions predict exclusive breastfeeding.

The present study

Given that only a minority of mothers exclusively breastfeed after six weeks (McAndrew et al., 2012), it is important to determine which factors are likely to promote exclusive breastfeeding. Research has demonstrated exclusive breastfeeding is predicted by social cognitive factors, such as self-efficacy (de Jager et al., 2014, 2015). Research into the role of emotions on breastfeeding is somewhat limited. Lawton et al. (2012) demonstrated that affective attitudes (e.g., viewing breastfeeding as pleasant/unpleasant, unenjoyable/enjoyable) predicted breastfeeding intention, initiation, and maintenance. Similarly, Diaz Meneses (2013) found emotions (e.g., empathy, shame, and pride) promote

breastfeeding behavior, defined as holding the baby correctly, eating healthy to breastfeed, and only breastfeeding. However, to our knowledge, there is little research assessing the extent to which self-conscious emotions (e.g., pride, guilt, and shame) and regret predict exclusive breastfeeding from 0-6 months. Therefore, the primary aim of this study was to assess the extent to which social-cognitive variables, fear, self-conscious emotions (e.g., pride, guilt, and shame) and regret predict exclusive breastfeeding from 0-6 months. The secondary aim was to assess the extent to which these variables predict feeding choice (i.e., exclusively breastfed, combination fed, or generally formula-fed).

Methods

Design

This study used a non-experimental one-group self-report survey. This design was used because it allowed the researchers to unobtrusively assess the extent to which numerous (social-cognitive and emotion) variables predict exclusive breastfeeding duration and infant feeding choice. The predictors were the social cognitive (attitude, subjective norm, perceived control, and self-efficacy) and emotions variables (pride, regret, negative self-conscious emotions, and fear of inadequate nutrition and of breastfeeding damaging one's physical appearance). The primary outcome variable was the duration that the infant was exclusively breastfed from 0-6 months. Although this measure has been used in previous research (de Jager et al., 2014), it does not differentiate between different types of feeding behavior. For example, a mother who has combination fed their infant since birth would be regarded as undertaking a low level of breastfeeding (less than 1 month). Therefore, a secondary outcome variable was the mother's feeding practice (exclusively breastfed, combination fed, tried breastfeeding but then formula-fed, and exclusively formula-fed).

Setting

This was an online study. The study was advertised on parenting groups and discussion boards on social media (e.g., Facebook). Data collection took place between October 2015 until January 2016.

Sample

Participants were informed at the start of the study that to take part they had to be 18 years or older, live in the UK, and be a mother of an infant between the ages of 6-12 months. This age range was chosen in order for the mothers to accurately recall exclusive breastfeeding from 0-6 months. A total of 468 mothers started this online survey. Fifty-one participants failing to complete the study. At the beginning of the study, participants were informed that if they close the browser (i.e., withdraw) their data would be deleted. As such, we deleted all 51 of these incomplete participants. A further 42 participants were removed because the data indicated that their infant was either too young or too old to take part in this research. Therefore, the final sample consisted of 375 mothers.

Measurement

The social-cognitive and emotion variables were assessed using the scales below. For each scale, the Cronbach's alpha refers to the sample in this study.

Feeding practice. Participants were asked to state how they fed their baby from 0-6 months or prior to weaning. There were five options: '*My baby was exclusively breastfed*', '*My baby received a mixture of breast milk and formula (combination fed)*', '*I started breastfeeding my baby, but then exclusively used formula*', '*I always formula fed my baby*', and '*Other*', with a space provided to specify the other types of feeding.

Exclusive breastfeeding. In line with previous research (de Jager et al., 2014), *breastfeeding duration* was assessed by asking participants how they long they exclusively breastfed their baby. Participants were able to select one of five responses: Less than 1

month, greater than 1 month but less than 2 months, greater than 2 months but less than 4 months, greater than 4 months but less than 6 months, and 6 months or more. In the analysis, these responses were coded 1-5, respectively.

Social-cognitive variables. All social-cognitive variables were rated on a 5-point Likert scale (1 = *Strongly disagree*, 5 = *Strongly agree*). Attitude was assessed using three items: 'Breastfeeding is *beneficial/important/positive*' ($\alpha = .89$). Subjective norm was assessed using three items: 'People who are important to me (e.g., friends and family) *support breastfeeding/think breastfeeding is important/think breastfeeding is beneficial*' ($\alpha = .93$). The perceived control and self-efficacy items were based on previous research (Armitage and Conner, 1999). There were 3 perceived control items: 'Whether or not I breastfed my baby was entirely up to me,' 'I had personal control over whether or not my baby was breastfed', and 'Whether or not my baby was breastfed was within my control' ($\alpha = .85$). The three self-efficacy items were: 'I had the ability to breastfeed my baby', 'I was confident that I could breastfeed my baby', and 'I was capable of breastfeeding my baby' ($\alpha = .82$).

Emotions towards breastfeeding. Although emotions are usually measured with reference to the first person (e.g., 'Breastfeeding would make me feel proud'), we were concerned that this would make the items less applicable to mothers who do not breastfeed. Therefore, the emotion items were referenced to women in general to avoid creating bias. All the emotion items were rated on a 5-point Likert scale (1 = *Strongly disagree*, 5 = *Strongly agree*). The pride items were: 'Mothers who breastfeed should feel proud', 'Breastfeeding mothers are likely to feel proud', and 'Breastfeeding should give mothers a sense of pride' ($\alpha = .81$). There were two negative self-conscious emotion items: 'Mothers who do not breastfeed may feel guilty' and 'Mothers are likely to feel ashamed if they do not breastfeed their baby' ($r = .47, p < .001$). Regret was a single-item measure: 'Mothers may regret not

breastfeeding their baby'. There were three items assessing the fear that breastfeeding may damage one's physical appearance: 'Women who breastfeed should *worry/be anxious/be afraid* about its effects on their physical appearance' ($\alpha = .92$). The fear of inadequate nutrition was measured using the following three items: 'Women who breastfeed should be *worried/anxious/afraid* that their baby may not be getting enough to eat' ($\alpha = .95$).

Data Collection

Ethical approval for this study was obtained from the authors' institutional ethics committee. After clicking on the web link in the recruitment advert, participants were presented with an information sheet stating the aims and procedure of the study, their rights as a participant (e.g., withdrawal), how the data will be used, and contact details for any queries. Willing participants were asked to tick a box indicating they gave consent and to continue with the study. Participants then completed demographic measures, stated their infant feeding practices and exclusive breastfeeding duration, and rated the social-cognitive and emotion variables. All participants were then thanked for their participation and debriefed about the study's aims.

Data Analysis

Initially, correlation analyses were conducted to assess the association between the predictor variables (i.e., the social-cognitive and emotional variables) and how these related to exclusive breastfeeding duration. Our primary aim was to assess the role of social-cognitive and emotion variables on exclusive breastfeeding duration. This was tested using linear multiple regression. Our secondary aim was to test the role of these factors on infant feeding choice. Because this dependent variable contained numerous categories (e.g., exclusively breastfed, combination fed, or formula-fed), this was tested using logistic regression.

Results

Demographic Information

The mothers were aged between 19-49 years ($M = 31.31$, $SD = 4.99$). These women were most likely to be working either full time ($n = 224$, 59.73%) or part time ($n = 86$, 22.93%) prior to going on maternity leave. These women were also most likely to be White ($n = 368$, 98.13%) and in a relationship ($n = 351$, 93.60%).

Exclusive breastfeeding duration

First, we assessed the extent to which the social cognitive and emotion variables predicted exclusive breastfeeding duration. Correlation analyses indicated that exclusive breastfeeding duration was positively predicted by attitude, subjective norm, perceived control, self-efficacy, pride, and regret (Table 1). Both the fear of damaging one's appearance and fear of inadequate nutrition negatively predicted exclusive breastfeeding duration. The negative self-conscious emotions did not predict exclusive breastfeeding.

Next, we conducted a linear multiple regression analysis. The predictor variables were the social-cognitive (attitude, subjective norm, perceived control and self-efficacy) and emotion variables (pride, negative self-conscious emotions, regret, and fear of damaging appearance and inadequate nutrition). The outcome variable was exclusive breastfeeding duration. The R^2 for this model was .33, $F(9, 356) = 19.88$, $p < .001$. Exclusive breastfeeding was positively predicted by self-efficacy, pride, and regret, but negatively predicted by fear of inadequate nutrition (Table 2). All other variables were non-significant. These results reflect the fact that self-efficacy, pride, and regret were positively and fear of inadequate nutrition was negatively associated with exclusive breastfeeding.

Feeding Practices

There were 14 mothers who selected 'other' when asked about their feeding behavior. The description of feeding included breastfed with formula top-ups, feeding expressed human

milk through a bottle, and initial formula feeds for a few weeks and then exclusive breastfeeding. These mothers were reassigned to one of the categories based on their descriptions of their feeding practices. Mothers were more likely to exclusively breastfeed their baby ($n = 306, 81.60\%$) than combination feed ($n = 36, 9.60\%$), start breastfeeding but then exclusively use formula ($n = 24, 6.4\%$), or always formula feed their baby ($n = 8, 2.13\%$). Given the low numbers of mothers who exclusively formula-fed their baby, in the analysis this category was combined with the started breastfeeding but then exclusively used formula category to create a group that generally formula-fed their baby.

Next, multinomial logistic regression was used to we assess whether the social-cognitive and emotion variables predicted feeding practices. The predictors were the social-cognitive and emotion variables. The outcome variable was feeding practice. This outcome variable had three categories (exclusively breastfed, combination fed and generally formula-fed). Given that we are primarily interested in the factors that predict breastfeeding, the exclusive breastfeeding category was the comparison group. The Nagelkerke pseudo- R^2 was .43, $\chi^2(18) = 134.43, p < .001$. Combination feeding was associated with lower self-efficacy than exclusive breastfeeding. Combination feeding was also associated with lower fear of damaging one's physical appearance than exclusive breastfeeding. By contrast, combination feeding was associated with higher attitudes and fear of inadequate nutrition than exclusive breastfeeding (Table 3). We also found that formula feeding was associated with higher subjective norm and fear of inadequate nutrition than exclusive breastfeeding. Formula feeding was also associated with lower self-efficacy, pride and regret than exclusive breastfeeding. These results reflect the fact that self-efficacy, pride and regret are positively while the fear of nutrition is negatively associated with exclusive breastfeeding.

Discussion

This study assessed the extent to which social-cognitive variables and emotions predicted exclusive breastfeeding from 0-6 months. In line with previous research (de Jager et al., 2014, 2015), we found that exclusive breastfeeding was positively associated with self-efficacy. Moreover, we supported previous research (e.g., Lawton et al., 2012; Diaz Meneses, 2013) by demonstrating that emotions were also associated with breastfeeding. Importantly, we enhanced this research by demonstrating that exclusive breastfeeding was associated with the fear of inadequate nutrition, pride, and regret. These factors (alongside subjective norm) were also significant predictors of whether a mother was likely to breast or formula feed their infant.

Generally, the research literature has assessed the role of negative emotions in promoting and deterring health behaviors (e.g., Ruiter, Kessels, Peters, & Kok et al., 2014; Sandberg & Conner, 2009). By contrast, we found that positive emotions were associated with exclusive breastfeeding duration. As such, we argue that it is important to assess the role of positive emotions on health behaviors. Health research has demonstrated the role of positive emotions on helping-based health behaviors, such as blood (Ferguson, Taylor, Keatley, Flynn, & Lawrence, 2012) and organ donation (O'Carroll, Foster, McGeechan, Sandford, & Ferguson, 2011). However, relative to research on negative emotions there is relatively little research assessing the role of positive emotions on other forms of health behaviors (for exceptions, see Mack et al., 2015; Onwezen et al., 2014). Therefore, it is important to consider the role of positive emotions on health behaviors.

This research also has practical implications. This research suggests that self-efficacy, pride, and regret promote breastfeeding, whilst the fear of inadequate nutrition deterred exclusive breastfeeding. As such, interventions should be developed that target these factors. Numerous studies have assessed the effectiveness of self-efficacy interventions on

breastfeeding (Nichols, Schutte, Brown, Dennis, & Price, 2009; Otsuka et al., 2014). However, there is little research assessing the effectiveness of pride interventions. Given the role of affective factors on breastfeeding (Faircloth, 2013; Lawton et al., 2012; Diaz Meneses, 2013), the use of emotion-based interventions may be particularly effective in promoting exclusive breastfeeding. Although previous research has found that emotion-based interventions may have mixed effects on health-behaviors (Godin et al., 2010; O'Carroll, Shepherd, Hayes, & Ferguson, 2016; Sandberg & Conner, 2009), these interventions have been based on negative emotions. The use of positive emotions may increase the likelihood of these interventions promoting health behaviors, such as exclusive breastfeeding. However, further research is needed to determine how pride can be effectively incorporated into interventions. Moreover, it is important to ensure that such interventions do not result in mothers feeling shame if they are unable or choose not to breastfeed. This is especially important given the detrimental effects of this shame (Leeming, 2016; Wollard, 2016).

Despite these research and practical implications, it is important to consider the limitations of this study. First, this study used a non-experimental design. Therefore, we cannot infer causal and effect relationships between our predictor and outcome variables. Indeed, although we suggest that the social-cognitive and emotion variables predict exclusive breastfeeding, it may be the case that exclusive breastfeeding influences people's perceptions and feelings. However, it should be noted that previous research using longitudinal designs have found that social-cognitive and emotional variables measured during pregnancy are likely to predict subsequent breastfeeding behavior (Lawton et al., 2012), thereby suggesting a directional relationship between these factors and breastfeeding behavior. Second, the emotions were not measured in the first person to ensure that the items were applicable to mothers who do not breastfeed. This had the potential to influence how mother responded as some may have felt that although women should not feel guilty, they do feel guilty for not

breastfeeding. Finally, mothers in our sample were more likely to exclusively breastfeed than combination or formula feed their infant. Although there were a sufficient number of mothers who combination or formula-fed to conduct the analyses, the high level of breastfeeding mothers created a sampling bias. As mentioned above, we combined the exclusively formula-fed with the initially breastfed but then use formula category to ensure sufficient numbers for the statistical analysis. The sample may have been more representative of the general population if mothers were recruited through healthcare services. Indeed, using this strategy may ensure that there are sufficient mothers in each of the feeding practice categories to avoid combining groups, thereby allowing for the comparison between these categories. However, these findings replicate the results of research that recruit participants through antenatal clinics (Blyth et al., 2002). As such, the sample was unlikely to bias the results.

In conclusion, this research assessed the extent to which social cognitive factors and emotions predict exclusive breastfeeding. We found that exclusive breastfeeding was positively associated with self-efficacy, pride, and regret, but negatively associated with fear of inadequate nutrition. These factors were also significant predictors of whether or not a mother was likely to breastfeed or formula feed their infant, alongside subjective norm. Based on this, we argue that incorporating pride into an emotion-based intervention may be effective in promoting exclusive breastfeeding. However, future research is needed to determine the effectiveness of pride-based interventions.

Funding

None

Declaration of Conflicting Interests

None

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Armitage, C. J., & Conner, M. (1999). Distinguishing perceptions of control from self-efficacy: Predicting consumption of a low-fat diet using the theory of planned behavior. *Journal of Applied Social Psychology*, 29(1), 72-90.
- Bai, Y., Wunderlich, S. M., & Fly, A. D. (2011). Predicting intentions to continue exclusive breastfeeding for 6 months: A comparison among racial/ethnic groups. *Maternal and Child Health Journal*, 15(8), 1257-1264.
- Baumeister, R. F., Vohs, K. D., DeWall, C. N., & Zhang, L. (2007). How emotion shapes behavior: Feedback, anticipation, and reflection, rather than direct causation. *Personality and Social Psychology Review*, 11(2), 167-203.
- Berndsen, M., van der Pligt, J., Doosje, B., & Manstead, A. (2004). Guilt and regret: The determining role of interpersonal and intrapersonal harm. *Cognition and Emotion*, 18(1), 55-70.
- Blyth, R., Creedy, D. K., Dennis, C. L., Moyle, W., Pratt, J., & De Vries, S. M. (2002). Effect of maternal confidence on breastfeeding duration: An application of breastfeeding self-efficacy theory. *Birth*, 29(4), 278-284.
- Brown, A., Raynor, P., & Lee, M. (2011). Healthcare professionals' and mothers' perceptions of factors that influence decisions to breastfeed or formula feed infants: A comparative study. *Journal of Advanced Nursing*, 67(9), 1993-2003.
- Conner, M., & Armitage, C. J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, 28(15), 1429-1464.

- de Jager, E., Broadbent, J., Fuller-Tyszkiewicz, M., & Skouteris, H. (2014). The role of psychosocial factors in exclusive breastfeeding to six months postpartum. *Midwifery*, 30(6), 657-666.
- de Jager, E., Broadbent, J., Fuller-Tyszkiewicz, M., Nagle, C., McPhie, S., & Skouteris, H. (2015). A longitudinal study of the effect of psychosocial factors on exclusive breastfeeding duration. *Midwifery*, 31(1), 103-111.
- Diaz Meneses, G. (2013). Breastfeeding: An emotional instinct. *Breastfeeding Medicine*, 8(2), 191-197.
- Dodgson, J. E., Henly, S. J., Duckett, L., & Tarrant, M. (2003). Theory of planned behavior-based models for breastfeeding duration among Hong Kong mothers. *Nursing Research*, 52(3), 148-158.
- Faircloth, C. (2013). "What feels right": Affect, emotion, and the limitations of infant-feeding policy. *Journal of Women, Politics and Policy*, 34(4), 345-358.
- Ferguson, E., Taylor, M., Keatley, D., Flynn, N., & Lawrence, C. (2012) Blood donors' helping behavior is driven by warm glow: More evidence for the blood donor benevolence hypothesis. *Transfusion*, 52(10), 2189-2200.
- Giles, M., McClenahan, C., Armour, C., Millar, S., Rae, G., Mallett, J., & Stewart-Knox, B. (2014). Evaluation of a theory of planned behaviour-based breastfeeding intervention in Northern Irish Schools using a randomized cluster design. *British Journal of Health Psychology*, 19(1), 16-35.
- Giner-Sorolla, R. (2001) Guilty pleasures and grim necessities: Affective attitudes in dilemmas of self-control. *Journal of Personality and Social Psychology*, 80(2): 206-221.
- Godin, G., Sheeran, P., Conner, M., Delage, G., Germain, M., Bélanger-Gravel, A., & Naccache, H. (2010). Which survey questions change behavior? Randomized

- controlled trial of mere measurement interventions. *Health Psychology*, 29(6), 636-644.
- Guyer, J., J Millward, L., & Berger, I. (2012). Mothers' breastfeeding experiences and implications for professionals. *British Journal of Midwifery*, 20(10), 724-733.
- Hannon, P. R., Willis, S. K., Bishop-Townsend, V., Martinez, I. M., & Scrimshaw, S. C. (2000). African-American and Latina adolescent mothers' infant feeding decisions and breastfeeding practices: A qualitative study. *Journal of Adolescent Health*, 26(6), 399-407.
- Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on Psychological Science*, 4(2), 162-176.
- Lawton, R., Ashley, L., Dawson, S., Waiblinger, D., & Conner, M. (2012). Employing an extended Theory of Planned Behaviour to predict breastfeeding intention, initiation, and maintenance in White British and South-Asian mothers living in Bradford. *British Journal of Health Psychology*, 17(4), 854-871.
- Lewis, M. (1995). Self-conscious emotions. *American Scientist*, 83(1), 68-78.
- Mack, D. E., Kouali, D., Gilchrist, J. D., & Sabiston, C. M. (2015). Pride and physical activity: Behavioural regulations as a motivational mechanism? *Psychology & Health*, 30(9), 1049-1062.
- Manstead, A. S. R., Proffitt, C., & Smart, J. L. (1983). Predicting and understanding mothers' infant-feeding intentions and behavior: Testing the theory of reasoned action. *Journal of Personality and Social Psychology*, 44(4), 657-671.
- McAndrew, F., Thompson, J., Fellows, L., Large, A., Speed, M., & Renfrew, M. J. (2012). *Infant Feeding Survey 2010*. Retrieved from the Health and Social Care Information Centre website: <http://www.hscic.gov.uk/catalogue/PUB08694/Infant-Feeding-Survey-2010-Consolidated-Report.pdf>

- McMillan, B., Conner, M., Woolridge, M., Dyson, L., Green, J., Renfrew, M., Bharj, K., & Clarke, G. (2008). Predicting breastfeeding in women living in areas of economic hardship: Explanatory role of the theory of planned behaviour. *Psychology and Health, 23*(7), 767-788.
- Nabulsi, M. (2011). Why are breastfeeding rates low in Lebanon? A qualitative study. *BMC Pediatrics, 11*(75), 1-6.
- O'Carroll, R. E., Foster, C., McGeechan, G., Sandford, K., & Ferguson, E. (2011). The “ick” factor, anticipated regret, and willingness to become an organ donor. *Health Psychology, 30*(2), 236-245.
- O'Carroll, R. E., Shepherd, L., Hayes, P., & Ferguson, E. (2016). Anticipated regret and organ donor registration. A randomised controlled trial. *Health Psychology, 35*(11), 1169-1177.
- Otsuka, K., Taguri, M., Dennis, C. L., Wakutani, K., Awano, M., Yamaguchi, T., & Jimba, M. (2014). Effectiveness of a breastfeeding self-efficacy intervention: Do hospital practices make a difference? *Maternal and Child Health Journal, 18*(1), 296-306.
- Onwezen, M. C., Bartels, J., & Antonides, G. (2014). The self-regulatory function of anticipated pride and guilt in a sustainable and healthy consumption context. *European Journal of Social Psychology, 44*(1), 53-68.
- Nichols, I., Schutte, N. S., Brown, R. F., Dennis, C. L., & Price, I. (2009). The impact of self-efficacy intervention on short-term breastfeeding outcomes. *Health Education and Behavior, 36*(2), 250-258.
- Roseman, I. J. (1991). Appraisal determinants of discrete emotions. *Cognition and Emotion, 5*(3), 161-200.

- Ruiter, R. A., Kessels, L. T., Peters, G. J. Y., & Kok, G. (2014). Sixty years of fear appeal research: Current state of the evidence. *International Journal of Psychology*, 49(2), 63-70.
- Ryan, K., Bissell, P., & Alexander, J. (2010). Moral work in women's narratives of breastfeeding. *Social Science and Medicine*, 70(6), 951-958.
- Ryan, K., Todres, L., & Alexander, J. (2011). Calling, permission, and fulfillment: The interembodied experience of breastfeeding. *Qualitative Health Research*, 21(6), 731-742.
- Sandberg, T., & Conner, M. (2008). Anticipated regret as an additional predictor in the theory of planned behaviour: A meta-analysis. *British Journal of Social Psychology*, 47(4), 589-606.
- Sandberg, T., & Conner, M. (2009). A mere measurement effect for anticipated regret: Impacts on cervical screening attendance. *British Journal of Social Psychology*, 48(2), 221-236.
- Shepherd, L., Watt, C., & Lovell, B. (2016). The role of social-cognitive and emotional factors on testicular self-examination. *Psycho-Oncology*. Advance online publication.
- Smith, C. A., & Lazarus, R. S. (1993). Appraisal components, core relational themes, and the emotions. *Cognition and Emotion*, 7(3-4), 233-269.
- Sniehotta, F. F., Pesseau, J., & Araújo-Soares, V. (2014). Time to retire the theory of planned behaviour. *Health Psychology Review*, 8(1), 1-7.
- Swanson, V., Nicol, H., McInnes, R., Cheyne, H., Mactier, H., & Callander, E. (2012). Developing maternal self-efficacy for feeding preterm babies in the neonatal unit. *Qualitative Health Research*, 22(10), 1369-1382.
- Tangney, J. P., & Dearing, R. L. (2002). *Shame and guilt*. New York: Guilford

- Tarrant, M., Dodgson, J. E., & Choi, V. W. K. (2004). Becoming a role model: The breastfeeding trajectory of Hong Kong women breastfeeding longer than 6 months. *International Journal of Nursing Studies*, 41(5), 535-546.
- Thomson, G., Ebisch-Burton, K. & Flacking, R. (2015). Shame if you do, shame if you don't: Women's experiences of infant feeding. *Maternal and Child Nutrition*, 11(1), 33-46.
- Tracy, J. L., & Robins, R. W. (2004). Putting the self into self-conscious emotions: A theoretical model. *Psychological Inquiry*, 15(2), 103-125.
- Tracy, J. L., & Robins, R. W. (2007). The psychological structure of pride: A tale of two facets. *Journal of Personality and Social Psychology*, 92(3), 506-525.
- Van Der Schalk, J., Bruder, M., & Manstead, A. S. R., (2012). Regulating emotion in the context of interpersonal decisions: The role of anticipated pride and regret. *Frontiers in Psychology*, 513.
- Van der Schalk, J., Kuppens, T., Bruder, M., & Manstead, A. S. (2015). The social power of regret: The effect of social appraisal and anticipated emotions on fair and unfair allocations in resource dilemmas. *Journal of Experimental Psychology: General*, 144(1), 151-157.
- Williamson, I., Leeming, D., Lyttle, S., & Johnson, S. (2012). 'It should be the most natural thing in the world': Exploring first-time mothers' breastfeeding difficulties in the UK using audio-diaries and interviews. *Maternal and Child Nutrition*, 8(4), 434-447.
- World Health Organization. (2015). *Maternal and newborn health: WHO European region has lowest global breastfeeding rates*. Retrieved from the World Health Organization website: <http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/news/news/2015/08/who-european-region-has-lowest-global-breastfeeding-rates>

World Health Organization. (2016). *Media Centre: Infant and young child feeding*. Retrieved from the World Health Organization website:

<http://www.who.int/mediacentre/factsheets/fs342/en/>

Zeelenberg, M., & Pieters, R. (2007). A theory of regret regulation 1.0. *Journal of Consumer Psychology*, 17(1), 3-18.

Table 1. Descriptive statistics and correlation coefficients for social cognitive, emotion and breastfeeding duration variables ($N=366$).

	M (SD)	1	2	3	4	5	6	7	8	9	10
1) Attitude	4.72 (0.68)	-									
2) Subjective norm	4.00 (0.88)	.44***	-								
3) Perceived control	4.55 (0.75)	.44***	.24***	-							
4) Self-efficacy	4.36 (0.81)	.50***	.34***	.60***	-						
5) Pride	4.46 (0.68)	.26***	.17**	.21***	.20***	-					
6) Negative self-conscious emotions	3.28 (0.78)	-.01	.04	-.18***	-.07	.04	-				
7) Regret	3.77 (0.81)	.19***	.10*	-.03	.05	.13*	.53***	-			
8) Fear of damaging appearance	1.41 (0.53)	-.14**	-.08	-.08	-.23***	-.12*	-.04	-.10*	-		
9) Fear of inadequate nutrition	1.53 (0.70)	-.18***	-.14**	-.21***	-.32***	-.13*	.13*	-.04	.35***	-	
10) Breastfeeding duration	4.46 (1.20)	.25***	.17**	.32***	.48***	.28***	-.06	.11*	-.16**	-.40***	-

Note. * = $p < .05$, ** = $p < .01$, and *** = $p < .001$. Listwise deletion was used to compute the correlation coefficients to ensure the values matched the linear multiple regression analysis.

Table 2. Linear multiple regression analysis of social cognitive and emotion variables on breastfeeding duration ($N = 366$).

	B (Lower, upper 95% CI)	SE	β
Attitude	-0.09 (-0.29, 0.10)	0.10	-.05
Subjective norm	-0.03 (-0.16, 0.11)	0.07	-.02
Perceived control	0.05 (-0.13, 0.23)	0.09	.03
Self-efficacy	0.55 (0.37, 0.72)	0.09	.37***
Pride	0.31 (0.16, 0.47)	0.08	.18***
Negative self-conscious emotions	-0.08 (-0.24, 0.09)	0.08	-.05
Regret	0.15 (-0.01, 0.30)	0.08	.10 [†]
Fear of damaging appearance	0.11 (-0.10, 0.32)	0.11	.05
Fear of inadequate nutrition	-0.47 (-0.63, -0.30)	0.08	-.27***

Note. [†] = $p < .10$, * = $p < .05$, ** = $p < .01$, and *** = $p < .001$.

Table 3. Multinomial logistic regression analysis of social cognitive and emotion variables on feeding practice ($N = 373$).

	Combination fed		Formula fed	
	B (SE)	Odds ratio (Lower, upper 95% CI)	B (SE)	Odds ratio (Lower, upper 95% CI)
Attitude	0.58 [†] (0.34)	1.78 (0.92, 3.46)	-0.19 (0.36)	0.83 (0.41, 1.67)
Subjective norm	-0.17 (0.25)	0.84 (0.51, 1.38)	0.79* (0.36)	2.20 (1.08, 4.45)
Perceived control	0.17 (0.29)	1.18 (0.67, 2.08)	-0.03 (0.32)	0.98 (0.52, 1.82)
Self-efficacy	-1.34*** (0.32)	0.26 (0.14, 0.49)	-1.60*** (0.37)	0.20 (0.10, 0.42)
Pride	-0.42 (0.27)	0.66 (0.39, 1.11)	-1.05** (0.31)	0.35 (0.19, 0.64)
Negative self-conscious emotions	0.09 (0.32)	1.09 (0.59, 2.03)	-0.15 (0.40)	0.86 (0.40, 1.87)
Regret	-0.37 (0.29)	0.69 (0.39, 1.22)	-0.90** (0.34)	0.41 (0.21, 0.80)
Fear of damaging appearance	-0.78 [†] (0.41)	0.46 (0.21, 1.02)	-0.41 (0.45)	0.66 (0.27, 1.61)
Fear of inadequate nutrition	0.81** (0.27)	2.25 (1.32, 3.83)	1.47*** (0.33)	4.36 (2.30, 8.27)

Note. [†] = $p < .10$, * = $p < .05$, ** = $p < .01$ and *** = $p < .001$.

