

# Initiation and continuation of breastfeeding: theory of planned behaviour

Vivien Swanson BA PhD PGCE DipPsych

Senior Lecturer, Department of Psychology, University of Stirling, Stirling, UK

Kevin G. Power MA MAppSci PhD

Head of Service, Tayside Area Clinical Psychology Department, Dundee, UK

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Correspondence:

Vivien Swanson,  
Department of Psychology,  
University of Stirling,  
Stirling FK9 4LA,  
UK.  
E-mail: vivien.swanson@stir.ac.uk

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**Aims.** This paper reports a study investigating new mothers' subjective norms in relation to both breast- and bottle-feeding. The influence of norms on women's infant feeding decisions and the relative influence of social referents at varying degrees of social distance were assessed.

**Background.** Increasing breastfeeding initiation and continuation rates is a key challenge for health educators. The perceived influence of other people's views (subjective norms), including the views of women's partners and health care professionals, is an important predictor of infant feeding behaviour.

**Methods.** Semi-structured questionnaires were administered to 203 new mothers in central and northern Scotland and followed-up by postal questionnaire at 6 weeks. Infant feeding intentions, feeding behaviour at birth and follow-up, behavioural beliefs and subjective norms for both breastfeeding and bottle-feeding were assessed. The data were collected in 1998–1999.

**Results.** Subjective norms were important determinants of initiation and continuation of breastfeeding for breast- and bottlefeeders. Breastfeeders rated close social referents as more in favour of bottle-feeding and more against breastfeeding at follow-up, whereas bottlefeeders' ratings did not change. Partner's and nurses'/midwives' views were an important influence at baseline and follow-up. Breastfeeding 'continuers' perceived their partners as more pro-breastfeeding at 6 weeks. Discontinuers perceived more overall social pressure to bottle-feed. However, sampling limitations may have led to over-representation of the views of breastfeeders at baseline and follow-up.

**Conclusions.** Nurses and midwives have a crucial role in communicating positive views on breastfeeding to new mothers at different time points. Future interventions to promote breastfeeding could adopt a broad social approach, encouraging positive norms for existing and potential mothers and fathers, families and people in general.

**Keywords:** subjective norms, Theory of Planned Behaviour, midwifery, bottle-feeding, breastfeeding

## Introduction

Encouraging women to breastfeed presents a major challenge to health care professionals. Despite attempts to

increase the numbers of women choosing to breastfeed, rates of initiation and continuation in many countries remain less than optimal (World Health Organization 1989, 2002, Campbell & Jones 1996, Office for National

Statistics 1997). A focus both on initiating and continuing breastfeeding is important, since many women fail to maintain breastfeeding for recommended periods, i.e. exclusive breastfeeding for the first 6 months of life and continuing breastfeeding up to 2 years of age and beyond (World Health Organization 2002). At present, although around 63% of women in Scotland initiate breastfeeding (Hamlyn *et al.* 2002), the rate 6–7 days after birth is currently estimated at 42% (Tappin *et al.* 2001).

There are many influences on a woman's decision to breastfeed, including social, cultural, economic and psychological factors. As a health behaviour, the decision is therefore guided not only by women's own underlying attitudes, skills, abilities and beliefs, but also by perceptions of what other people think. Many people harbour strong opinions regarding breastfeeding. Such opinions include evaluations of whether breastfeeding is good or bad for the mother and/or infant, and beliefs about the breastfeeding process, such as for how long women should breastfeed, whether they should feed in public, etc. These socio-cultural beliefs are referred to as social norms, and are implied group rules about what constitutes appropriate behaviour (White *et al.* 1994). There are several definitions and usages of the concept of social norms. One which is relevant to our understanding of social normative influences on breastfeeding and bottle-feeding is presented by Rimal and Real (2003, p. 195) as: 'group identity-based codes of conduct that are understood and disseminated through group interaction'. This includes reference to the extent of an individual's identification with a particular social group (e.g. 'new mothers') and the mechanism for internalizing information relevant to group membership (e.g. by interaction with other new mothers, or other relevant social referents).

Social cognition models provide a useful framework for studying social norms in relation to infant feeding behaviour, and some studies have applied the Theory of Reasoned Action (TRA) (e.g. Manstead *et al.* 1983, 1984, Quarles *et al.* 1994, Humphreys *et al.* 1998, Kloeben *et al.* 1999) and the Theory of Planned Behaviour (TPB) (Janke 1994, Wambach 1997, Duckett *et al.* 1998, Kim 1998) to infant feeding. In these studies, attitudes were significantly related to feeding intentions and behaviour. However, the picture is less clear for social norms, and the way norms have been conceived and measured has varied, as have the social referents to which they have been applied. Cialdini *et al.* (1990) differentiate between norms, describing what is normal or typical (descriptive) and what is morally approved or disapproved (injunctive). Most studies of infant feeding behaviour use the latter, as proposed in Ajzen and Fishbein's (1980) approach.

In the TPB, Ajzen (1991) defines subjective norms as perceived social pressure to perform or not to perform a behaviour. Subjective norms are derived by summing items measuring beliefs about several social referents' views of the target behaviour (Conner & Norman 1996). Perceived importance of these views is also recorded. A variety of social referents has been used in previous infant feeding research. Investigation of the views of the partner, the woman's own mother, her friends and medical professionals have been common, whereas more distal referents including 'childbirth educators' (Janke 1994) and 'mother-in-law' (Wambach 1997) have also been included. However, few studies have differentiated between the importance of various social referents. The partner's beliefs about breast- and bottle-feeding are an important source of influence (Freed *et al.* 1993, Shepherd *et al.* 2000). The views of midwives and nurses also have an important influence on successful breastfeeding in hospital immediately after birth (Tarkka *et al.* 1998), and in the following weeks. Interestingly, the importance of different social referents may vary in different cultures. Greek women attach greater importance to the views of medical practitioners than do women in Scotland (Swanson & Power 2000). A mother's infant feeding attitudes and behaviour may also be influenced by what is deemed acceptable in her own culture. In this context, mothers' perceptions of pressure to breast- or bottle-feed from wider society have not been routinely measured.

The influence of subjective norms on women's decisions may be different for feeding initiation and continuation, since the nature and circumstances of these decisions vary. Where a woman has not previously had children, subjective norms may be important, as she may be more likely to seek or consider others' opinions in making her initial choice, and may lack confidence in her decision to continue breastfeeding, in comparison with women who have already experienced breast- or bottle-feeding. One study (Manstead *et al.* 1983) suggested that subjective norms are more important for primiparous than multiparous mothers, but neither subjective norms nor previous breastfeeding experience contributed significantly to behaviour at follow-up. Wambach (1997) suggested that (injunctive) subjective norms did not significantly predict intentions. However, in both of these studies, norms were measured prenatally (in the last 6 weeks of pregnancy, and after 24 weeks of pregnancy, respectively). Although a large proportion of women have decided on their preferred feeding method well before this stage, for some the feeding decision is not made until later in pregnancy, with as many as 14% suggesting that they deferred the decision until late preg-

nancy/after delivery (Swanson & Power 2000). Subjective norms may become more salient when people have personal experience of the target behaviour (Cialdini *et al.* 1990). Some women may not be aware of others' opinions about infant feeding until faced with the choice, undertaking the behaviour and experiencing the reactions of others, or actively seeking opinions from different sources. This suggests that the influence of perceived social norms is likely to change over time in relation to experience.

### Breastfeeding and bottle-feeding

Few studies differentiate beliefs about breast- and bottle-feeding, failing to acknowledge the importance of beliefs about bottle-feeding in influencing breastfeeding initiation and continuation (Janke 1994, Martens & Young 1997, Kloeben *et al.* 1999). In some (e.g. Manstead *et al.* 1983, Wambach 1997), the decision is viewed as dichotomous (Ajzen & Fishbein 1980), and differential measures of breast- and bottle-feeding are employed. However, there may not be a simple inverse linear relationship between breast- and bottle-feeding beliefs, as there is not a simple relationship between the two behaviours, with many women opting to combine them. Women may have positive and negative beliefs about both feeding methods, and attitudes towards the two may be less strongly related than is generally assumed (Duckett *et al.* 1998). Given the state of knowledge of the health benefits of breastfeeding, there is also potential for researcher bias in loading questions towards evaluation of the benefits of breastfeeding, failing to take account of possible 'negatives' in breastfeeding and 'positives' in bottle-feeding.

## The study

### Aims

The Theory of Planned Behaviour was previously used to investigate how attitudes, subjective norms and perceived behavioural control (PBC) predicted women's infant feeding behaviour at birth (Swanson & Power 2000). Subjective norms were shown to play an important role in the choice of infant feeding method at birth. To investigate this further, the aim of the current study was to measure changes in the influence of subjective norms on infant feeding method from birth to 6-week follow-up for breastfeeders and bottlefeeders, particularly in relation to women who discontinue breastfeeding during this time. The study also aimed to assess the relative importance in relation to choice of feeding method of the views of

women's partners, own mothers, and midwives and nurses at baseline and follow-up.

### Participants

New mothers were interviewed in two hospital maternity units in north and central Scotland over a 3 month period during 1998/1999. All primiparous or multiparous mothers who had given birth via 'normal' vaginal or caesarean section delivery 48 hours previously were eligible, and were invited to take part. Following the guidance of ward staff, mothers were not approached if one of the following criteria applied: mother or baby was seriously ill; baby currently in the neonatal unit; physical problems of mother or baby made breastfeeding impossible. Women whose level of spoken English was not sufficient to enable understanding of the questions were excluded. Although interviewers aimed to include all eligible mothers, some were unavailable whilst the researcher was in the hospital, and some unwilling to participate.

### Power calculation

Power analysis indicated that samples of  $n = 64$  breastfeeders and bottlefeeders would be required to demonstrate a medium group effect for mean comparisons of attitudes and norms with  $\alpha = 0.05$  and  $\beta = 0.80$  (Cohen 1992). Similarly, multiple regression analysis with five independent variables would require  $n = 91$  participants. We aimed to recruit approximately 100 patients in each group to allow for attrition at follow-up, and estimated approximately 60% would be classified as breastfeeders at birth based on previous figures for Scotland overall (Office for National Statistics 1997). The final samples of 103 and 100 mothers represented 24.7% and 19% of all live births respectively in the central and northern NHS Trust areas in the 3-month period of the study. Participants were followed-up by questionnaire in the community at 6 weeks.

### Procedure

Semi-structured interviews using a schedule devised for this study were carried out in the maternity wards by two academic postgraduate researchers. Interviews lasted 45 minutes on average, and collected demographic information, feeding intention (prior to birth) and current behaviour. Questions on TPB components, breastfeeding and bottle-feeding beliefs, subjective norms and PBC were self-completed scales administered at the end of the interview. Participants were sent a one-off postal follow-up questionnaire to their home address 6 weeks afterwards.

Questionnaires included the following:

- *Demographic information:* age, education level (7 point scale where 1, 'no formal qualifications'; 2, 'O' levels/standard grades'; to 7, 'postgraduate degree'), marital status, and housing type. Partner's employment status (where available) and woman's employment status located women according to socio-economic status (SES) on a scale (1, high; 6, low).
- *Past behaviour:* Participants were asked whether they had previous children, and if so whether breastfed or bottle-fed.
- *Feeding intention:* Women reported retrospectively how they had intended to feed their baby before birth (breast, bottle or combined feeding).
- *Feeding behaviour (baseline):* Women were asked how they were feeding their baby in hospital, and classified as 'breastfeeding', 'combined feeding' or 'bottle-feeding'. Definitions were based on WHO Global Data Bank on Breastfeeding:
  - *Breastfeeding:* infant receives only breast milk (including expressed milk);
  - *Combined feeding:* infant receives breast milk and regular bottle-feeding with baby formula milk.
  - *Bottle-feeding:* infant receives baby formula milk from a bottle.
- *Feeding behaviour (follow-up):* Current feeding behaviour at follow-up (breastfeeding, bottle-feeding or combined feeding) was recorded.

Social cognition model components were measured as follows:

#### (i) Behavioural beliefs

These were based on items used by Manstead *et al.* (1983), and from review of the literature to reflect additional intrinsic (e.g. perception of breastfeeding as 'natural') and extrinsic factors (e.g. ease of returning to work for the mother). Twenty items were categorized into four equal subscales, reflecting agreement with positive and negative breastfeeding and bottle-feeding beliefs. Examples of categorization of beliefs were: 'breast feeding protects the baby against infection' [breastfeeding (BF) positive]; 'breastfeeding is embarrassing for the mother' (BF negative); 'bottle-fed babies put on weight quickly' [bottle-feeding (BO) positive]; 'preparing feeds for bottle-fed babies is inconvenient' (BO negative). Each item was rated on a seven-point likert scale from 1 (disagree strongly) to 7 (agree strongly).

Evaluations of the importance of breastfeeding and bottle-feeding beliefs were also measured on 7 point scales. An example was 'Using a feeding method that is a natural way of feeding is...' which was rated on a scale from 'not at all important to me' (1) to 'very important to me' (7).

#### (ii) Subjective norms

Subjective norms regarding breastfeeding and bottle-feeding were devised according to the TPB as follows:

*Normative beliefs:* measured by recording level of agreement/disagreement with five social referents' infant feeding views. There were five statements each for breastfeeding and bottle-feeding (10 in total), e.g. 'my midwives/nurses think I...'; 'my own mother thinks I...', varying only in the named social referent. The scale had end-points labelled 'definitely should breastfeed' (bottle-feed), and 'definitely should not breastfeed' (bottle-feed) with a 7 point likert response format. Referents were the partner, woman's own mother, closest female friend, midwives/nurses and 'people in general'.

*Evaluations* of importance of referent's views was measured, e.g. 'people in general's views on feeding babies are...', with end points labelled 'not at all important to me' (1) and 'very important to me' (7).

#### (iii) Perceived behavioural control

Control over the infant feeding decision was rated in hospital and at follow-up as follows: 'how much control do you feel you had over this decision about feeding your baby...' using 7 point scales with end points representing (1) 'no control' and (7) 'complete control'.

### Ethical considerations

Ethical approval was given by research ethics committees in both NHS trusts involved in the study, and by the researchers' university departmental ethics committee. Introductory letters were given to potential participants by nursing staff. These outlined the study and stressed the voluntary and confidential nature of participation. Women who agreed orally to take part were subsequently approached by the researcher, who explained the study in more detail and explained that women could terminate the interview at any time.

### Data analysis

Frequency histograms with fitted normal curves were used to check the distribution of the data. In accordance with the TPB, weighted behavioural belief scores and subjective norm scores were calculated by multiplying each belief by evaluations of importance. For the current study, negative belief subscales were subtracted from positive subscales to give two items measuring breastfeeding and bottle-feeding beliefs respectively. Similarly, aggregated subjective norm scores (adding all referents) were calculated in relation to breastfeeding and bottle-feeding. Questions regarding perceived

normative beliefs for different social referents were repeated at follow-up. Evaluations of referents' views at baseline were again used as weightings.

Demographics for breastfeeders and bottlefeeders at baseline were compared using chi-square and *t*-tests. Similarly, responders and non-responders at follow-up were compared in relation with their demographic characteristics. Logistic regression was used to investigate the contribution of TPB components, behavioural beliefs, subjective norms, and perceived control to predicting prenatal feeding intentions and breastfeeding behaviour at baseline and follow-up. The small number of women who reported combined feeding at baseline in hospital ( $n = 4$ ) and at follow-up ( $n = 14$ ) were classified as breastfeeders for these analyses. Weighted and unweighted beliefs and norm scores were compared in preliminary regression analyses. In each case, weighted scores contributed more variance to prediction of behaviour, so were retained in analyses. The PBC variable was substantially skewed, so was transformed (log) in this analysis.

To investigate social norms in more detail, normative beliefs and evaluations of importance for various social referents for breastfeeders and bottlefeeders were compared using univariate tests (*t*-test, one-way ANOVA) at baseline and follow-up. Paired *t*-tests were used to assess changes in norms reported at baseline and follow-up. Breastfeeding 'continuers' and 'discontinuers' were also compared. It is acknowledged that multiple testing can lead to increased risk of type 1 error. A conservative significance level of  $\alpha = 0.01$  was therefore applied for univariate tests.

## Results

A total of 203 mothers were interviewed at baseline. Of these, 60% were breastfeeding, 38% bottle-feeding, and 2% combined feeding as shown in Table 1.

Breastfeeders differed from bottlefeeders in hospital as follows: bottlefeeders were younger ( $P < 0.001$ ) more likely to be single ( $P < 0.01$ ), had less full-time education ('O' levels/Standard grades vs. 'Highers'/A levels) [mean 2.2

(SD 1.3) vs. mean 3.9 (SD 1.9)  $P < 0.001$ ], were of lower SES (based on partner's/own employment status if no partner) ( $P < 0.01$ ), and were more likely to live in rented accommodation than breastfeeders ( $P < 0.01$ ). Half (99, 49%) of the sample were multiparous. Of these, 53 (53%) reported having previously breastfed. There was a significant level of agreement between previous and current feeding method (Cohen's kappa = 0.60,  $P < 0.001$ ). A small number of the multiparous women had chosen a different feeding method with their new baby, with 8 (16% of previous breastfeeders) now bottle-feeding and 11 (24% of previous bottlefeeders) now breastfeeding.

A total of 118 women (58% of baseline sample) responded at follow-up. Fifty-seven (48%) responders were breastfeeding at 6 weeks, 47 (40%) bottle-feeding and the remainder (14, 12%) combined feeding (Table 1). The three 'combined' feeders in hospital reported bottle-feeding at follow-up. Of 82 women breastfeeding at baseline and responding at follow-up, 57 (70%) were therefore 'continuers' (still exclusively breastfeeding), 11 (13%) were combined feeders and 14 (17%) 'discontinuers' had changed to bottle-feeding by 6 weeks.

Comparing baseline characteristics of 118 responders with 85 non-responders at follow-up revealed that responders were more likely to have breast-fed than bottle-fed in hospital ( $\chi^2 = 11.9$ , d.f. 2,  $P < 0.01$ ), less likely to live in rented accommodation ( $\chi^2 = 9.8$ , d.f. 2,  $P < 0.01$ ), and had a higher education level [ $t(201) = 3.6$ ,  $P < 0.001$ ] than non-responders.

## Reliability of TPB components

### Behavioural beliefs

Reliability analysis gave values of Cronbach's  $\alpha = 0.75$ , 0.67, 0.59, and 0.74 for the five item BF positive, BF negative, BO positive and BO negative subscales, respectively. Two variables (BF positive minus BF negative, and BO positive minus BO negative) were used in the analysis.

### Normative beliefs

Reliability analysis gave values of Cronbach's  $\alpha = 0.74$ , and 0.68 respectively for breastfeeding (five items) and bottle-feeding (five items) normative beliefs at baseline, and  $\alpha = 0.81$ , and 0.84 at follow-up.

## Predicting choice of infant feeding method: prebirth intention, behaviour at baseline and follow-up

The 122 women who were breastfeeding and 77 who were bottle-feeding in hospital differed significantly in terms of

**Table 1** Infant feeding method for women at baseline and follow-up

	Baseline (whole sample)	Baseline (follow-up sample)	6 weeks follow-up
<i>n</i> (%)	203 (100%)	118 (58%)	118 (58%)
Current feeding method			
Breast	122 (60%)	82 (69.5%)	57 (48.3%)
Bottle	77 (38%)	33 (28.0%)	47 (39.8%)
Combined	4 (2%)	3 (2.5%)	14 (11.9%)

beliefs about breastfeeding and bottle-feeding (Swanson & Power 2000). Not unexpectedly, breastfeeders reported significantly more positive beliefs towards breastfeeding [mean 13.2 (SD 6.2) vs. mean 6.9 (SD 7.6)] [ $t(182) = 6.1$ ,  $P < 0.001$ ] and bottlefeeders reported more positive beliefs about bottle-feeding [mean 10.6 (SD 6.1) vs. mean 2.0, SD 7.4] [ $t(185) = 8.1$ ,  $P < 0.001$ ]. In terms of subjective norms, breastfeeders reported more positive breastfeeding norms than bottlefeeders at baseline and follow-up. Bottlefeeders similarly reported more positive bottle-feeding norms at baseline and follow-up, (Table 2). There was no significant difference in perceived control over their choice of infant feeding method in hospital for breastfeeding (mean 6.9, SD 1.0) and bottle-feeding mothers (mean 6.7, SD 0.32).

There was a high level of agreement between women's reported feeding intention before birth, and behaviour at baseline (Cohen's Kappa = 0.92,  $P < 0.001$ ). Eight women

(10%) who had intended to bottle-feed were breastfeeding in hospital, and no women who had intended to breastfeed were currently bottle-feeding in hospital.

In order to investigate whether social norms were independent predictors of breastfeeding intention and behaviour, breastfeeding and bottle-feeding norms, breastfeeding and bottle-feeding behavioural beliefs, and PBC over the feeding decision were entered into logistic regressions, predicting breastfeeding intention (prebirth), and behaviour at baseline and at follow-up, as shown in Table 3. Norms were measured both at baseline and follow-up.

*Predicting intention*

The model correctly classified 88% of cases overall, 92% of breastfeeders and 79% of bottlefeeders, and was significant ( $\chi^2 = 113.2$ , d.f. 5,  $P < 0.001$ ). Breastfeeding and bottle feeding beliefs, but not subjective norms, were significant predictors of intentions.

**Table 2** Comparison of breastfeeders' and bottlefeeders' subjective norms\* and normative beliefs for different social referents at baseline and follow-up

Social referent	Breast-feeders		Bottlefeeders		P (95% CI)	
	Mean	SD	Mean	SD		
Overall subjective norms (breastfeed)						
Baseline	27.3	4.0	20.4	4.7	$P < 0.001$ (-8.2 to -5.7)	
Follow-up	27.0	5.0	20.2	4.6	$P < 0.001$ (-9.2 to -4.4)	
Normative beliefs (breastfeed)						
Baseline	Partner	6.0	1.2	3.4	1.4	$P < 0.001$ (-3.0 to -2.3)
Follow-up		5.7	1.5	3.5	1.5	$P < 0.001$ (-2.9 to -1.5)
Baseline	Own mother	5.4	1.6	3.4	1.3	$P < 0.001$ (-2.4 to -1.6)
Follow-up		5.0	1.6	3.3	1.4	$P < 0.001$ (-2.4 to -0.97)
Baseline	Female friend	5.4	1.5	3.9	1.4	$P < 0.001$ (-1.9 to -1.0)
Follow-up		5.5	1.6	4.4	2.1	$P = 0.002$ (-2.3 to -0.33)
Baseline	Midwives/nurses	6.0	1.2	5.2	1.5	$P < 0.001$ (-1.2 to -0.44)
Follow-up		6.1	1.2	5.0	2.0	$P < 0.001$ (-1.9 to -0.39)
Baseline	People in general	4.6	1.0	4.7	1.4	$P = 0.58$ (-0.25 to 0.44)
Follow-up		5.0	1.1	4.9	1.8	$P = 0.76$ (-0.63 to 0.47)
Overall subjective norm (bottle-feed)						
Baseline		15.7	4.2	20.5	4.7	$P < 0.001$ (3.6 to 6.2)
Follow-up		16.7	6.2	21.8	4.7	$P < 0.001$ (2.3 to 7.8)
Normative beliefs (bottle-feed)						
Baseline	Partner	2.7	1.4	4.5	1.6	$P < 0.001$ (1.3 to 2.1)
Follow-up		3.1	1.8	4.7	1.2	$P < 0.001$ (0.83 to 2.3)
Baseline	Own mother	3.1	1.5	4.7	1.4	$P < 0.001$ (1.2 to 2.0)
Follow-up		3.7	1.8	5.0	1.3	$P = 0.001$ (0.66 to 2.0)
Baseline	Female friend	3.1	1.5	4.2	1.6	$P < 0.001$ (0.66 to 1.50)
Follow-up		3.2	1.7	4.3	1.6	$P = 0.002$ (0.41 to 1.9)
Baseline	Midwives/nurses	2.9	1.3	3.4	1.5	$P = 0.011$ (0.12 to 0.92)
Follow-up		2.9	1.6	3.9	1.4	$P = 0.005$ (0.29 to 1.6)
Baseline	People in general	4.0	1.1	3.9	1.4	$P = 0.59$ (-0.45 to 0.28)
Follow-up		3.6	1.1	4.0	1.0	$P = 0.06$ (-0.002 to 0.88)

\*Unweighted subjective norms for women defined as breastfeeders or bottlefeeders at baseline.

**Table 3** Logistic regression analysis predicting intention (prebirth), breastfeeding behaviour at baseline and at 6 weeks follow-up from TPB components (behavioural beliefs, subjective norms and perceived behavioural control)

	Unstandardized Coefficient (B)	Wald test (P)	Odds ratio (exp B)	95% CI for odds ratio	
				Lower	Upper
<b>1. Intention (prebirth)</b>					
Breastfeeding beliefs	0.02	5.5 ( $P < 0.05$ )	1.02	1.00	1.03
Bottle-feeding beliefs	-0.03	17.4 ( $P < 0.001$ )	0.96	0.95	0.98
Subjective norm (breastfeeding)	0.02	3.4	1.01	0.99	1.04
Subjective norm (bottle-feeding)	-0.01	0.57	0.99	0.97	1.01
Perceived behavioural control	-1.1	2.5	0.33	0.97	1.01
<b>2. Behaviour (baseline)</b>					
Breastfeeding beliefs	0.02	5.5 ( $P < 0.05$ )	1.02	1.00	1.03
Bottle-feeding beliefs	-0.04	15.7 ( $P < 0.001$ )	0.96	0.94	0.98
Subjective norm (breastfeeding)	0.04	8.8 ( $P < 0.01$ )	1.04	1.01	1.07
Subjective norm (bottle-feeding)	-0.02	2.28	0.98	0.96	1.01
Perceived behavioural control	-0.88	0.54	0.41	0.04	4.4
<b>3. Behaviour (follow-up, norms at baseline)</b>					
Breastfeeding beliefs	-0.01	1.97	0.99	0.97	1.01
Bottle-feeding beliefs	-0.03	20.93 ( $P < 0.001$ )	0.96	0.95	0.98
Subjective norm (breastfeeding)	0.01	2.18	1.01	0.99	1.03
Subjective norm (bottle-feeding)	-0.01	0.72	0.99	0.97	1.01
Perceived behavioural control	-0.31	0.27	0.72	0.03	17.5
<b>4. Behaviour (follow-up, norms at follow-up)</b>					
Breastfeeding beliefs	-0.02	2.30	0.98	0.96	1.01
Bottle-feeding beliefs	-0.03	8.60 ( $P < 0.01$ )	0.97	0.95	0.99
Subjective norm (breastfeeding)	0.04	7.09 ( $P < 0.01$ )	1.04	1.01	1.08
Subjective norm (bottle-feeding)	-0.03	3.95 ( $P < 0.05$ )	0.96	0.93	0.99
Perceived behavioural control	-1.7	1.04	0.31	0.01	5.0

*Predicting behaviour: feeding decision in hospital*

This model correctly classified 91% of cases at baseline, including 94% of breastfeeders and 83% of bottlefeeders, and was significant ( $\chi^2 = 144.7$ , d.f. 5,  $P < 0.001$ ). Breastfeeding and bottle-feeding beliefs (in a negative direction), and breastfeeding subjective norms predicted breastfeeding behaviour.

*Predicting behaviour: follow-up*

Behaviour at follow-up was investigated using norms measured at baseline and at follow-up. With baseline norms 83% of cases were correctly classified, 86% of breastfeeders and 79% of bottlefeeders ( $\chi^2 = 59.4$ , d.f. 5,  $P < 0.001$ ). Only bottle-feeding beliefs were significant predictors. Using norms measured at follow-up however, 91% of cases were correctly classified, 94% of breastfeeders and 85% of bottlefeeders ( $\chi^2 = 53.2$ , d.f. 5,  $P < 0.001$ ). Bottle-feeding beliefs and breastfeeding and bottle-feeding subjective norms were significant predictors in this model.

**Past behaviour**

There were no significant differences between primiparous and multiparous mothers in terms of overall beliefs or

subjective norms at baseline, or follow-up. Similarly comparing multiparous mothers who had breastfed with those who had not, revealed no overall differences in normative beliefs. The regressions were repeated including previous experience of breastfeeding. This did not increase the prediction of cases in these models.

**Comparison of subjective norms at baseline and follow-up**

It appears from the above analysis that subjective norms are an important influence on women's infant feeding behaviour at different time points. Comparison of breastfeeders' and bottlefeeders' normative beliefs at baseline and follow-up is shown in Table 2.

Considering different social referents, breastfeeders/combined feeders at baseline reported significantly more agreement with social norms regarding breastfeeding as expressed by their partner, own mother, close female friends and midwives/nurses than bottlefeeders. Similarly bottlefeeders reported significantly more agreement with social norms regarding bottle-feeding as expressed by their partner, own mother, friends and nurses, than breastfeeders. There were no differences between breastfeeders and bottlefeeders regarding

normative views of people in general – either at baseline or follow-up.

Differences emerged between breastfeeders and bottlefeeders in relation to evaluation of the importance of social referents. Rankings of the views of different referents; partner, nurses, own mother, female friends and people in general, was the same for both groups as shown in Figure 1.

However, breastfeeders rated their partner's views as more important (mean 6.0, SD 1.3) than did bottlefeeders (mean 5.5, SD 1.7) [ $t(194) = 2.7, P < 0.01$ ]. There was no significant difference in ratings of nurses' views for breastfeeders (mean 5.3, SD 1.6) and bottle-feeders (mean 4.7, SD 1.6).

### Change in breastfeeding and bottle-feeding norms

Paired *t*-tests investigated changes from baseline to follow-up. There was no significant change in overall subjective norms for either group from baseline to follow-up, and for bottlefeeders no change in norms for any referent group. For breastfeeders significant changes occurred in subjective norms for specific referent groups. Attitudes of 'people in general' were perceived to be more pro-breastfeeding [ $t(81) = 3.2, P < 0.01$ ] at follow-up. Their own mother's attitudes were perceived to be more anti-breastfeeding [ $t(73) = 3.3, P < 0.01$ ] and more pro-bottle-feeding [ $t(66) = 3.3,$

$P < 0.01$ ]. There was no significant change in breastfeeders' perceived norms for partners, female friends or nurses.

### Comparison of 'continuers', combined feeders and 'discontinuers' at follow-up

From baseline, 57 breastfeeders were 'continuers', 11 had changed to combined feeding (combined), and 14 were bottle-feeding (discontinuers) at follow-up. These groups were compared in terms of demographic factors and normative beliefs at baseline and at follow-up.

There were no demographic differences. Although there were no significant differences in norms at baseline, significant differences emerged at follow-up as seen in Table 4. Continuers perceived their partner as more pro-breastfeeding than both combined-feeders and discontinuers. Discontinuers perceived their partner as more pro-bottle-feeding than combined-feeders and continuers, and perceived their own mother, closest female friend, and nurses to be more pro-bottle-feeding than 'continuers'.

### Discussion

A woman's decision to breastfeed or bottle-feed is influenced by what is socially acceptable or desirable, and open to social and cultural influences. This study assessed injunctive social norms regarding initiation and continuation of breastfeeding for new mothers, using the TPB as a conceptual framework (Ajzen 1991). The temporal stability of subjective norms was also assessed in relation to different aspects of infant feeding – the decision to initiate breastfeeding or bottle-feeding, and in relation to continuation of chosen feeding method at 6 weeks. Normative influences can come from close or distant sources of social reference – and were examined in relation to referents differing in social distance, including woman's partner, midwives/nurses and 'people in general'.

Comparisons of women in hospital after birth indicated that breastfeeders perceived more social pressure to breast-feed than bottlefeeders and bottlefeeders perceived more social pressure to bottle-feed. It is unsurprising that women's perceptions of social norms would be in favour of their chosen feeding method. However, of particular interest in this study was the detailed analysis of women's perceptions of social pressure from different sources of reference, and change in perceptions of these views in relation to initiation and continuation of chosen feeding method. The views of the woman's partner, her own mother, and midwives/nurses in terms of both initiation and continuation of breastfeeding or bottle-feeding were very important, as in other studies (Freed *et al.* 1993, Tarkka *et al.* 1998, Shepherd *et al.* 2000).

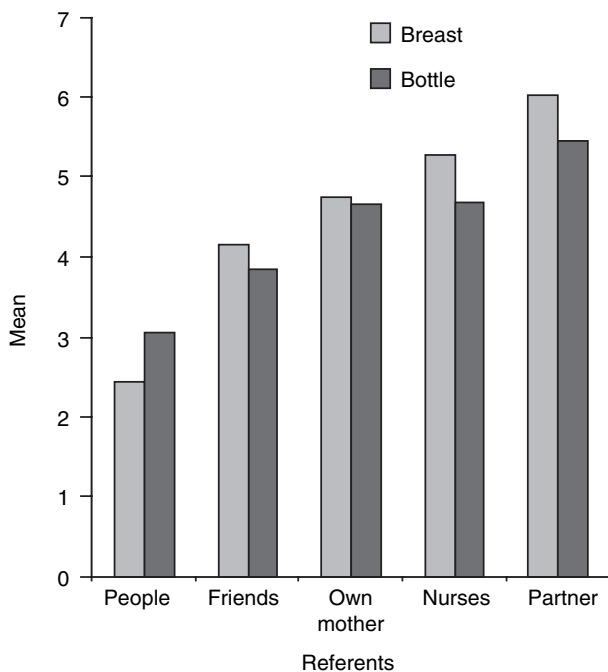


Figure 1 Breastfeeders' and bottlefeeders' ratings of the importance of the views of different social referents.

	Group 1 continuers ( <i>n</i> = 57)	Group 2 combined- feeders ( <i>n</i> = 11)	Group 3 discontinuers ( <i>n</i> = 14)	<i>f</i> (2, 78)	Group comparisons Scheffe test ( <i>P</i> < 0.05)
Social norms					
‘Should breastfeed’					
People in general	4.8 (0.98)	5.1 (1.3)	5.2 (1.3)	n.s.	
Partner	6.0 (1.2)	5.5 (1.4)	3.8 (1.6)	11.6 ( <i>P</i> < 0.001)	1–3, 2–3
Own mother	5.2 (1.5)	4.8 (1.9)	4.1 (1.6)	n.s.	
Female friend	5.7 (1.3)	5.2 (1.7)	5.1 (2.4)	n.s.	
Midwives/nurses	6.1 (1.6)	6.2 (1.0)	6.1 (1.7)	n.s.	
‘Should bottle-feed’					
People in general	3.6 (1.0)	3.7 (1.3)	3.8 (1.2)	n.s.	
Partner	2.3 (1.5)	3.7 (0.9)	5.3 (1.2)	24.6 ( <i>P</i> < 0.001)	1–2, 1–3, 2–3
Own mother	3.1 (1.5)	4.4 (1.5)	4.9 (2.0)	7.7 ( <i>P</i> < 0.01)	1–3
Friend	2.6 (1.4)	3.7 (1.4)	4.8 (1.9)	10.5 ( <i>P</i> < 0.01)	1–3
Midwives/nurses	2.6 (1.4)	3.2 (1.8)	4.1 (1.7)	5.3 ( <i>P</i> < 0.01)	1–3

**Table 4** Comparison of breastfeeding and bottle-feeding normative beliefs at follow-up for breastfeeding ‘continuers’, combined-feeders and ‘discontinuers’

Although several previous studies have noted the importance of the woman’s partner, her own mother’s views would merit more detailed study, particularly in relation to different socio-cultural contexts.

It is of particular interest to note that both breastfeeders and bottlefeeders rated the views of nurses as second in importance to their partners’ overall. This has important implications for clinical practice. Nurses could be encouraged to capitalize on this finding to encourage women to initiate breastfeeding and to offer continued support in the community for those who wish to continue and to maintain exclusive breastfeeding for recommended periods.

These ratings were obtained in hospital shortly after birth, suggesting that encouragement from nurses in relation to promoting breastfeeding may be particularly important at this time. Supportive and consistent advice for women at this vulnerable time may help both breastfeeders and bottlefeeders to cope better with the demands of new motherhood (Tarkka *et al.* 1998). It may be useful for future studies to measure ‘importance’ ratings longitudinally, as women transfer from hospital to community care. This would enable health professionals to target resources towards mothers at particular times of transition when their input is most needed or valued. Other comparisons revealed that ‘continuers’ at 6 weeks follow-up rated their partner, own mother, and midwives/nurses as having more pro-breastfeeding views than ‘discontinuers’, suggesting they may have received more positive support.

Maintaining both formal support from health professionals and informal support for breastfeeders is crucial in prolonging breastfeeding. Health education efforts could focus on both close and distant social referents to prolong breastfeeding – perhaps by encouraging the involvement of partners and

other family members in the breastfeeding process, and by removing external social barriers to breastfeeding outside the home. The study also found that breastfeeders gave higher importance ratings for partners’ and nurses’ views than did bottlefeeders, whereas bottlefeeders rated the views of ‘people in general’ as more important. These findings have implications for health professionals promoting positive attitudes to breastfeeding, particularly in women from socially disadvantaged backgrounds, who are currently more likely to bottle-feed. More informally structured relationships between midwives and community nurses and women in socially disadvantaged areas may encourage women to assign more importance to health professionals’ views on infant feeding. Women’s partners could also be involved in educational programmes to promote breastfeeding in ante-natal classes, or if bottle-feeding, to consider the option of breastfeeding for future children. Since attitudes may be formed early, structured and informative breastfeeding education for school pupils would also be appropriate.

The longitudinal study of social norms is important. Although agreement with norms about breastfeeding and bottle-feeding remained stable for bottlefeeders, for breastfeeders there was a change in perceived social pressure from some referents between baseline (initiation) and follow-up (continuation). Whereas ‘people in general’ were seen as more pro-breastfeeding at 6 weeks, women’s own mothers were seen as more anti-breastfeeding and pro-bottle-feeding. Of course, this is only a perception of negative views, perhaps reflecting projection of participants’ views onto others (Freed *et al.* 1993). Separate questioning of participants and social referents concerned could establish the objective accuracy of this. Nevertheless, this may indeed reflect mothers’ experience of barriers to continuation of breastfeeding. These may

### What is already known about this topic

- Psychological factors, including behavioural beliefs and normative beliefs, are important influences on women's decisions to breastfeed or bottle-feed.
- The social normative views of different social referents, including women's partners, their own mothers and health care professionals can influence these decisions.

### What this paper adds

- Social normative pressure varied at different time points after birth, women's own mothers were less supportive of breastfeeding at 6 weeks than at the baby's birth.
- Women who stopped breastfeeding perceived their partners, own mothers, friends and nurses as more in favour of bottle-feeding at follow-up than those who continued breastfeeding.
- The views of nurses and midwives were rated as very important by breastfeeders and bottle-feeders, which underlines the importance of health care professionals supporting women to initiate and continue breastfeeding.

include the impact of a new baby on the mother and partner's relationship, barriers to breastfeeding in public, and the impact of breastfeeding on social/family life. The questionnaire methodology used in this study may be insufficiently sensitive to differentiate between these issues. Using a qualitative interview-based approach would identify specific influences on normative beliefs during early stages of breastfeeding. In the current climate of the 'Baby Friendly Hospital', little information is given to new mothers regarding bottle-feeding (Cairney & Alder 2001). Results of the present study have highlighted the importance of bottle-feeding beliefs, and the fact that these may change over time as a reflection of mothers' infant feeding experience.

Caution should be exercised interpreting some results in relation to the sample representativeness. The proportion of women breastfeeding in our study was in line with figures for Scotland at the time of the study and, although there are variations in breastfeeding rates between regions in Scotland (Tappin *et al.* 2001), differences between the two hospitals in this study were not statistically significant. However, we were not able to record the number of mothers excluded from the study at baseline. This is important as it has been shown that women taking part in research are more likely to breastfeed (Shepherd *et al.* 1998). Additionally, the follow-up sample over-represented breastfeeders, and may have had

a socio-economic bias. Demographic characteristics were measured, and important, as in other studies (e.g. Quarles *et al.* 1994, Sikorski *et al.* 2001). Women with more education were more likely to intend to breastfeed, to breastfeed in hospital and at follow-up. In addition, socio-cognitive factors measured in the TPB significantly predicted breastfeeding intention and behaviour at different time points. This is in line with other studies where the TRA/TPB has been a useful model in predicting breastfeeding intentions and behaviour (Manstead *et al.* 1983, 1984, Wambach 1997, Duckett *et al.* 1998).

It should also be noted that we were only able to measure intention retrospectively, so this was not a test of the full TPB model. Similarly, one of the main features of the TPB model, PBC, was not a significant predictor in this study. Since the study included both breastfeeders and bottlefeeders, control was assessed in relation to the feeding decision. More detailed measurement of control over the behaviour at different time points may have improved prediction from this variable, and different aspects of control than were measured here may be important. Control, conceptualized as self-efficacy may be a crucial counter-balance to social norms which are not in favour of a behaviour such as breastfeeding.

Nevertheless, with these reservations, it appears that the overall TPB framework offers a theoretically useful method of measurement of perceived social pressure in relation to both breastfeeding and bottle-feeding for new mothers. Future studies could extend the concept of subjective norms in relation to infant feeding. It is important to know how descriptive or group norms (i.e. perceptions of what women at different degrees of social distance actually do) influence infant feeding. Issues of self-identity and social identity may also prove fruitful lines of enquiry in establishing whether women identify themselves as 'breastfeeders' or 'bottlefeeders'.

Most attempts to improve breastfeeding rates in the UK have focused on the mother, with limited success (Tappin *et al.* 2001). A much broader approach could be adopted if breastfeeding initiation and continuation rates are to be substantially increased in the UK in the future, targeting existing or future fathers, grandparents, health professionals and other individuals within the mother's social network, using focused educational campaigns to change attitudes within wider society towards breastfeeding and bottle-feeding.

### Author contributions

Study conception and design/Drafting of Manuscript/Critical revisions – VS, KP; Data collection/Data analysis/Statistical expertise – VS.

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