UNIVERSITY OF SOUTHERN QUEENSLAND

"I THINK I CAN"; EXPLORING THE INFLUENCE OF PSYCHOLOGICAL FACTORS ON BREASTFEEDING DURATION

A Dissertation submitted by
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For the award of
Doctor of Philosophy

2007

Abstract

Only a minority of Australian women continue to breastfeed for what is known to be the optimal duration for the health of the mother and her baby. This mixed method study of the determinants of breastfeeding duration is situated within the post-positivist paradigm, and uses both qualitative and quantitative data in a triangulated study design. The study aimed to identify the psychological factors which influence the duration of breastfeeding, in the hope that modifiable factors would arise which may assist women to meet their longer term breastfeeding goals. This two-phase study was conducted in Toowoomba, Queensland and began with a qualitative enquiry involving three groups of mothers separated according to their various experiences of breastfeeding, and one group of experienced breastfeeding clinicians (n = 21). Using the nominal group technique, these women were asked to generate a list of the psychological factors they believed influenced the duration of breastfeeding. Group results were considered individually and collectively, and comparisons between groups were made. The groups generated a list of 53 psychological factors they believed may have an influence on the duration of breastfeeding. In Phase 2, these data and the extant literature were used to inform the content of a questionnaire constructed to measure the relevant individual psychological characteristics of a sample of postnatal women, and the relationship between these factors and breastfeeding duration to 6 months postpartum. Participants for Phase 2 were recruited from one public and one private hospital in the regional city of Toowoomba, Queensland (n = 372), and completed a self-report questionnaire during the 14 days following the birth. Telephone interviews at 6 months postpartum gathered data regarding the woman's current feeding method and time of weaning. The duration of breastfeeding was associated with psychological factors including dispositional optimism, breastfeeding self-efficacy, faith in breastmilk, breastfeeding expectations, anxiety, planned duration of breastfeeding and the time of the infant feeding decision. After removing the effect of socio-demographic variables, the woman's faith in breastmilk and her planned breastfeeding duration were unique predictors of the duration of Fully breastfeeding. Analysis of the data for the duration of Any breastfeeding revealed three unique predictors including faith in breastmilk, planned breastfeeding duration and

breastfeeding self-efficacy. The data also showed that 44% of the sample experienced some form of postnatal distress in the 14 days following the birth in the form of anxiety, stress and/or depression. Of these three distinct states, only anxiety was associated with breastfeeding duration. This enhanced knowledge of the psychological variables which influence breastfeeding duration may be used to construct a tool capable of identifying women at risk of early weaning for additional support or interventions. Additionally, this knowledge may form the basis of an intervention designed to modify psychological variables known to place breastfeeding at risk, thereby assisting women to breastfeed for longer.

CERTIFICATION OF DISSERTATION

I certify that the ideas, experimental work, results, analyses, software and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

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Signature of Candidate Date

ENDORSEMENT

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Signature of Supervisor/s Date

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Acknowledgments

I would firstly like to acknowledge the tremendous help, encouragement and support provided by my supervisors Dr Elizabeth Buikstra, Dr Tony Fallon, and particularly Professor Desley Hegney, who has been with me throughout the entire journey. Thank you all for your generosity in sharing with me your boundless knowledge, your valuable insights, your enthusiasm for research, and your very precious time. You are an inspiration. A special thanks also to the women who gave their time to participate in this research. I feel very privileged to have been allowed to share in this special journey with you in some small way. Well-earned thanks also to the midwives and staff at the Toowoomba Health Service and St Vincent's Hospitals maternity units, who supported this work.

Thanks also goes to my beautiful girls Kirra and Tiffany, who have suffered through 'get-your-own' dinners, solitary weekends and a very distracted mother for longer than I'd care to admit, and yet are always ready to forgive me at the end of the day. Special thanks to my dear friend Nancey, whose consistent and unwavering support has often been the hand I needed to steady me on my path. Sincere thanks also to my dad John Hayes, my sister Jenni, and my friends Sandra, Cheryl, Liam, Jen, Geoff, Wendy, Maree and Ben, who were there to bully, cajole and cheer me on throughout. Thanks also goes to my workmates at the Centre for Rural and Remote Area Health, and the Domestic and Family Violence Service, who put up with my constant chatter about breastfeeding, and made many allowances for my sleep deprived state.

Finally, I would like to thank my man. Peter, in many ways this enormous project seems as much yours as mine. You have patiently endured the seemingly endless interruptions to our lives that have been necessary along the way, and always with love, understanding and encouragement. When times got tough you were always there with a ready ear, a shoulder to lean on and seemingly boundless faith in my abilities. I couldn't have done this without you my darling, thank you.

I would like to dedicate this work to my Mum, who would have been so proud - gone but never forgotten Tots.

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The real voyage of discovery consists not in seeking new landscapes,
but in having new eyes.
Marcel Proust

Chapter One: Introduction

1.0 Problem Statement and Introduction

A growing body of evidence has revealed the importance of breastfeeding to the health and wellbeing of babies, mothers, the environment and the economy. This evidence suggests that Exclusive breastfeeding to 6 months of age should be followed by continued breastfeeding in addition to appropriate supplemental foods at least until the baby's first birthday, and ideally beyond this age. Australia has embraced this evidence, and breastfeeding initiation rates are currently close to national targets. However, the vast majority of Australian mothers continue to introduce supplemental foods and/or cease breastfeeding well before the full range of breastfeeding benefits can be conferred, and breastfeeding rates remain well below those targeted for 3 and 6 months of age. Research into the factors which influence breastfeeding duration has identified many factors associated with early breastfeeding cessation, but the majority of these factors are socio-demographic and not amenable to modification. These known breastfeeding determinants therefore offer little hope for increasing the length of time for which Australian women breastfeed. Research investigating the role of psychological factors on breastfeeding duration is in its infancy. Nevertheless this area of enquiry has yielded some promising results, and it seems possible that modifiable psychological factors which play an important protective role over breastfeeding duration may exist. However, no research aimed at identifying the psychological determinants of breastfeeding duration could be found in the literature.

This dissertation is a report of a mixed-method study aimed at exploring and identifying the psychological factors which influence the length of time for which women breastfeed. The research design included two phases. Phase 1 involved four groups of women with differing experiences of breastfeeding. These women were asked to share their perceptions of the psychological factors which influence breastfeeding duration, and to decide which factors are of most importance. Phase 2 involved the psychometric measurement of several of the identified factors to

measure their effect on breastfeeding duration in a cohort of women giving birth in a regional Australian setting. Data were analysed using Cox regression survival analysis. These analyses were used to identify which (if any) of the psychological factors under consideration contribute to the prediction of breastfeeding duration, and their importance relative to the other socio-demographic and psychological factors in the data set.

This first chapter of the dissertation begins by briefly summarising the history of breastfeeding in Australia, before discussing common methodological problems encountered in breastfeeding research, and other issues of relevance to the conduct of this study. The health and other consequences of breastfeeding will then be outlined, followed by a discussion of the small number of circumstances in which breastfeeding is thought to be inadvisable, and the current recommendations on the optimal duration of breastfeeding. A brief summary of the significance of the stated problem will then be provided. The chapter concludes with a statement of the study objectives, and an overview of the organisation of this dissertation.

1.1 Breastfeeding in Australia

Around the turn of the twentieth century, breastfeeding rates in Australia and other developed countries began a decline that persisted until the late 1960s. Records taken at this time show that around 50% to 60% of Australian mothers were breastfeeding on discharge from hospital, and only 21% were breastfeeding at 3 months (NHMRC, 1992). Breastfeeding rates in Australia and comparable overseas countries began to increase again in the early 1970s, beginning with the higher socio-economic groups and more educated women (Siskind, Del Mar, & Schofield, 1993). In 1979 the Commonwealth Department of Health announced a Food and Nutrition Policy which included a goal to increase breastfeeding. This position was further strengthened in 1981 when Australia became a signatory to the World Health Organisation (WHO) International Code for the Marketing of Breast Milk Supplements (NHMRC, 2003; WHO, 1981). The aim of this Code was to protect and promote breastfeeding by ensuring that the use of breastmilk substitutes was based on adequate information, and that formula companies adopt appropriate marketing and distribution practices (WHO, 1981). Australia's adoption of the Code, along with numerous statements regarding the feeding of infants and young children made by the NHMRC over time, recognise that the health of the Australian

population begins with adequate nutrition in infancy. This decision also signalled official support for the well documented evidence regarding the superiority of breastfeeding as the method of infant feeding (NHMRC, 2003).

Australia is also one of the few countries in the world to include breastfeeding among its National dietary guidelines (NHMRC, 2003). In addition, breastfeeding prevalence and duration targets were set for Australia as part of its National Health Goals and Targets for the year 2000 (Nutbeam, Wise, Bauman, Harris, & Leeder, 1993). These targets quantified a national aim to increase "Exclusive breastfeeding" rates to 90% at discharge, 60% at 3 months, and 50% at 6 months. Aims for "Any breastfeeding" rates (including "Exclusive" and "Complementary" breastfeeding) were set at 80% for 3 and 6 month old babies alike (for breastfeeding definitions see Appendix A).

These public health efforts to support and encourage breastfeeding in Australia appear to have been successful in increasing breastfeeding initiation rates. While the research methodology has attracted some criticism (Donath & Amir, 2000b), evidence from the two most recent National Health Surveys show that in 1995, approximately 86% of all Australian 3 year olds were breastfed (at all) when first taken home from hospital, and results for 2001 were similar at 87% (Australian Bureau of Statistics, 2003). These data are very close to meeting the 90% of women initiating "Any breastfeeding" in Australia's breastfeeding targets (Nutbeam, Wise, Bauman, Harris, & Leeder, 1993). Data for "Exclusive breastfeeding" were not provided. More recent smaller scale studies undertaken in the Darling Downs region of Queensland where the current research takes place suggest what appears to be a further small increase in this initiation rate. Data from these studies showed that 90% (Hegney et al., 2003) to 97% (O'Brien, 2003) of women were breastfeeding at all at hospital discharge in this area, and 82.4% (Hegney et al., 2003) and 86% (O'Brien, 2003) of these women were "Exclusively breastfeeding". These initiation rates are considerably higher than those reported by other Western nations, such as the United Kingdom (Bolling, 2006), Canada, and the United States (Callen & Pinelli, 2004).

While breastfeeding initiation rates in Australia today are relatively high however, the duration of breastfeeding is currently far from the recommended 6 months of "Exclusive breastfeeding" for the majority of Australian babies. Evidence from the 1995 and 2001 National Health Surveys suggest that the proportion of children receiving any breastmilk at all declines steadily as the child grows older

(Australian Bureau of Statistics, 2003). The more recent survey suggests that by 6 months of age, around 48% of children were being breastfed at all, and this declined to 23% of children at 12 months, and only 1% of children being breastfed at age two (Australian Bureau of Statistics, 2001a). No infants were being "Fully breastfed" at 6 months of age in either the 1995 or 2001 samples (Australian Bureau of Statistics, 2003). It should be noted however that these data were collected prior to the increase in the recommended duration of "Exclusive breastfeeding" in Australia which occurred in 2003 (NHMRC, 2003).

Also prior to the change in recommendations, the University of Southern Queensland's Centre for Rural and Remote Area Health conducted a longitudinal study of 625 women giving birth in Toowoomba hospitals (Hegney et al., 2003). As seen in Table 1.1, these data suggested that "Fully breastfeeding" rates may differ according to private or public hospital admission. These results also showed that "Fully breastfeeding" rates dramatically declined in both groups at 6 month follow-up, leaving only around 7% of women "Fully breastfeeding" their infant at 6 months of age. Thus, despite a growing body of evidence confirming the benefits of 6 months of "Exclusive breastfeeding" to both mother and baby, there is still work to be done if Australia's breastfeeding goals are to be met. Late in 2006, there was a call for submissions to a breastfeeding inquiry by Australia's House of Representatives (2006), the outcome of which is still unknown.

Table 1.1

Breastfeeding Rates in Toowoomba Hospitals, 2002

Hospital	Age	Comp† %	Full%	Any BF‡ %
THSD[a]	Predischarge	7.9	73.9	81.8
	3 mth	15.3	45.4	60.7
	6 mth	42.5	7.3	49.8
St Vincents	Predischarge	7.7	87.3	95.0
	3 mth	12.3	57.4	69.7
	6 mth	51.9	6.7	58.6

Note: Data taken from the Toowoomba Infant Support Service Project, *N* = 625 (Hegney et al., 2003). THSD[a] = Toowoomba Health Service District Hospital.
† Comp = Complimentary breastfeeding; ‡ BF = breastfeeding.

1.2 Issues in Breastfeeding Research

There is a large body of evidence linking breastfeeding with positive health outcomes for both the mother and her baby (Leon-Cava, Lutter, Ross, & Martin, 2002). Breastfeeding has also been associated with better economic (Smith, Thompson, & Ellwood, 2002) and environmental (Stuart-Macadam & Dettwyler, 1995) outcomes. However, problems with the conduct, communication or utilisation of breastfeeding research can impact on the usefulness of these results. This section of the dissertation will provide a brief outline of some of the common problems that have been encountered with the conduct and communication of breastfeeding research. Efforts to avoid some known pitfalls during the conduct of the current studies will then be described, including the provision of clear definitions of breastfeeding, and relevant biographical information on the researcher.

1.2.1 Methodological Issues in Breastfeeding Research

Several decades of research has been conducted to investigate the outcomes and determinants of breastfeeding. However, many studies have suffered from methodological difficulties and other shortcomings which leave the results open to question (LINKAGES, 2006). Perhaps the most common and significant issue weakening breastfeeding research is the common omission of clear operational definitions for breastfeeding intensity (Bernshaw, 1991; Bland, Rollins, Solarsh, Van den Broeck, & Coovadia, 2003). For infant feeding practices and trends to be monitored over time and across cultural boundaries it is imperative that clear

definitions of the different patterns of breastfeeding behaviours are clearly articulated. Studies which do not provide a clear definition of breastfeeding cannot easily be compared with other research, and make it difficult or impossible to gauge any dose-response effect of breastfeeding, such as that seen in the results of some breastfeeding studies (Vohr et al., 2006). As a result, several breastfeeding classification systems have been proposed to address this problem (Breastfeeding Committee for Canada, 2004; Labbok, Belsey, & Coffin, 1997; Labbok & Krasovec, 1990; Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003; WHO, 1991). However, many researchers continue to create their own definitions for breastfeeding or worse, leave breastfeeding undefined (e.g., Khassawneh, Khader, Amarin, & Alkafajei, 2006; Shiva & Nasiri, 2003).

A second major problem with breastfeeding research is the impossibility of conducting randomised controlled trials, where infants can be assigned to receive breastmilk or formula (Hector, Webb, & Lymer, 2004). This practice would be clearly unethical and can not be considered under any circumstances. However, the lack of any opportunity to use this "gold standard" research (Campbell, Surry, & Royle, 1998) introduces numerous confounds into the research design which will often call results into question.

Other common problems include the inadequate control of confounding factors through statistical analysis, reliance on prolonged maternal recall, failure to assess the dose-response effect, unclear definitions of outcome measures (i.e., illness or disease) and problems with the methods used for data collection (Hector, Webb, & Lymer, 2004). While several of these problems are inherent to many epidemiological studies, issues such as these have often led to doubts about the results of research into the health and other consequences of breastfeeding. On a more positive note, breastfeeding studies are numerous, and many have been well designed and reported. The evidence favouring breastfeeding is therefore generally derived from multiple studies conducted in a variety of settings.

1.2.3 Defining Breastfeeding in this Research

In order to avoid one of these known methodological pitfalls, careful consideration was given to the selection of breastfeeding definitions to be used in the current study. Recommendations put forward by the Australian Food and Nutrition Monitoring Unit (Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003)

conclude that it would be prudent for Australian researchers to adopt the World Health Organisation (WHO) set of breastfeeding definitions to monitor Australian breastfeeding patterns. The decision was made primarily because the WHO breastfeeding classification system builds on international work to promote standardisation. These definitions have been adopted in this research, and can be found in Appendix A. To improve readability, defined breastfeeding categories such as "Fully breastfeeding", "Complementary breastfeeding", "Artificially feeding", and "Any breastfeeding" will henceforth be presented in title case, without the use of quotation marks.

1.2.2 A Word on Language

Another issue of importance to breastfeeding researchers is the language used when communicating the results of infant feeding studies. The presentation of breastfeeding information involves several, often unconsciously made choices which can impact on the meaning derived by the reader. Wiessinger (1996) contends that the language used in breastfeeding communications frequently subverts the intention to promote breastfeeding, for several reasons. One problem raised by Wiessinger is the frequent use of words such as "ideal" and "optimal" when describing breastfeeding. She asks the reader "Are you the *best possible* parent? Is your home life *ideal*? Do you provide *optimal* meals for your family?" (Wiessinger, 1996, p. 1; italics added). For most of us the answers to these questions would probably be in the negative. The problem is that the experiences of many listeners may lead them to consider *ideal* to be an admirable goal, not a minimum standard. Presenting breastfeeding as the best possible way to feed babies because it is an ideal, perfectly balanced food, may therefore actually subvert our intention to promote breastfeeding as the natural method of feeding human infants. Also, when breastfeeding is positioned as the ideal, the underlying assumption is that formula feeding is the "normal" and "adequate" way to feed an infant. This language may therefore subtly undermine the listeners' breastfeeding self-efficacy, and contribute to beliefs about the adequacy of formula feeding (Wiessinger, 1996).

Similarly, the vast majority of breastfeeding texts and presentations discuss the advantages of breastfeeding, for example "lower rates" of childhood illness, or a "reduced risk" of cancer (Hollander, 2002; Raisler, Alexander, & O'Campo, 1999). The unspoken question "lower than what?" goes unnoticed, but the implication is

lower than “normal”, again positioning artificial feeding as the normal way to feed an infant, against which breastfeeding is being compared (Wiessinger, 1996). This does not make sense given breastfeeding’s undisputed place as the biological norm for feeding human infants, and may again increase the audiences’ acceptance of the adequacy of artificial milks.

Finally, studies have demonstrated that patients presented with information about a proposed medical treatment perceived the risk of harm from this treatment as greater when they were told that ten percent died as a result, than they did when told that ninety percent survived, though clearly the facts remained the same (Marteau, 1989). This suggests that a discussion of the benefits of breastfeeding may have less of an impact on breastfeeding rates than a discussion of the adverse consequences of infant formula feeding. Together, these arguments suggest that the choice of words and phrases used during discussions of infant feeding may play a powerful role in subsequent perceptions of breastfeeding. All discussion of infant feeding in this dissertation will therefore attempt to position breastfeeding as the biological norm, with due care to word choice.

1.2.4 A Note from the Researcher

While every effort was made to conduct this study without researcher bias, it may also be helpful at this juncture to provide some brief personal information relevant to the researcher’s experiences and beliefs about breastfeeding. To begin, if there are sides to be taken in the infant feeding debate, then I’m for mothers. Not breastfeeding mothers or artificially feeding mothers, just mothers. Motherhood is far from easy in today’s world and for many women, neither is breastfeeding. Along my own journey as a mother, breastfeeding counsellor and researcher I have been privileged to share the infant feeding stories of many women. Many of these women have struggled through sometimes extraordinary circumstances to provide their baby with breastmilk. Other women have expressed despair after weaning earlier than they had wanted. Many have reported feeling like they have swapped pain, stress and misery for guilt, lowered self-esteem and perceived social stigmatisation. The pain and distress evident in many women’s breastfeeding stories has often left me humbled and saddened, regardless of the end result. While I did manage to successfully breastfeed my two beautiful girls (now 16 and 18 years old) for 2 to 3 years each, breastfeeding was not always easy for me either. I do not find it difficult

to understand and accept any woman's decision to artificially feed, nor do I underestimate the effect of the sometimes mixed and complex emotions that underlie the infant feeding experiences of many women.

At the same time I am passionate about breastfeeding. What I eventually experienced as the natural, joyful, fundamental act of providing my babies with my own, perfectly composed breastmilk is an experience I would wish for every mother and baby. I've also been convinced of the importance of breastmilk to the health and welfare of the infant and the mother through my exposure to research such as that discussed in the following section. With this comes a sense of our responsibility as a community to support, enable and empower women who wish to breastfeed to ensure that they may do so. Observing the grief and sometimes despair experienced by a mother whose strong desire to breastfeed her infant has been disappointed due to insufficient or inadequate support makes me sad and angry in turn. It is this desire to ease the passage of women along their infant feeding journey which underlies this research.

My training and experience as a psychologist and researcher also brings with it important perspectives which influence my approach to this research question. The first is a fascination and concern for the human condition in all its complex, multi-faceted glory, and the second is a healthy respect for the scientific method. University training and previous research experience has dragged me from approaching numbers with terror to feeling cautiously comfortable with this mode of enquiry in answering questions such as the one posed by this research. Also, current political and social realities would suggest that evidence gained through empirico-analytical means is more likely to contribute to positive change for breastfeeding women at this time. However, the impersonal and ostensibly "value free" nature of the positivist tradition does not sit easily with my fascination and concern for women as individuals, leading me to proffer a triangulated design which incorporates both qualitative and quantitative traditions. Thus this study takes a post-positivist approach, as outlined in Chapter 3 of this dissertation.

1.3 Health and Other Consequences Associated with Breastfeeding

The importance of promoting and protecting breastfeeding as the natural method of infant feeding has been clearly demonstrated by the literature. Breastfeeding has long been recognised as having many positive physical and psychological consequences for the mother and child that make it "an unequalled way of providing ideal food for the healthy growth and development of infants" (WHO/UNICEF, 1989, p. 3). The unique nutritional and immunological properties of breastmilk have been shown to protect breastfed infants against numerous health threats, leaving artificially fed infants at a clear health disadvantage. This research shows that artificially fed infants are at a higher risk of gastrointestinal illness, lower respiratory tract infections and otitis media (Dewey, Heinig, & Nommsen-Rivers, 1995; Ford & Labbok, 1993; Heinig, 2001; Leon-Cava, Lutter, Ross, & Martin, 2002; Raisler, Alexander, & O'Campo, 1999). Additionally, artificially fed infants may have an increased risk of necrotising enterocolitis (Lucas & Cole, 1990) sudden infant death syndrome (Alm et al., 2002; Ford et al., 1993), childhood cancers (Davis, 1998; Leon-Cava, Lutter, Ross, & Martin, 2002; Shu et al., 1999) obesity (Armstrong & Reilly, 2002; Gillman et al., 2001; Grummer-Strawn & Mei, 2004; Herder, Bergmann, Kallischnigg, & Plagemann, 2005; Lederman, Akabas, & Moore, 2004; Von Kries et al., 1999), atopic dermatitis (Rothenbacher, Weyermann, Beermann, & Brenner, 2005), allergic diseases (Leon-Cava, Lutter, Ross, & Martin, 2002; Muraro et al., 2004; van Odijk et al., 2003), Type 2 diabetes mellitis (Owen, Martin, Whincup, Davey Smith, & Cook, 2006; Stuebe, Rich-Edwards, Willett, Manson, & Michels, 2005) and Type 1 insulin dependent diabetes mellitus (Gimeno & de Souza, 1997; Leon-Cava, Lutter, Ross, & Martin, 2002; Mayer et al., 1988), when compared to breastfed infants.

Artificial feeding may also negatively impact on the infant's cognitive development. A study of over 1,000 New Zealand children found that breastfed children displayed cognitive ability and educational achievements which were superior to those who had not been breastfed, the effects of which endured into young adulthood (Horwood & Fergusson, 1998). Other studies which have controlled for potential confounds such as the mother's age, socio-economic status, level of intelligence, education, parity, and smoking status (Angelsen, Vik, Jacobsen,

& Bakketeig, 2001; Mortensen, Michaelsen, Sanders, & Reinisch, 2002), have also found a persistent association between the duration of breastfeeding and the child's performance on intelligence tests into young adulthood.

However, there is concern that methodological issues such as the use of inappropriate or insufficient samples, the use of global indirect indicators of the home environment, and/or the failure to sufficiently control for maternal IQ may have confounded these results (Der, Batty, & Deary, 2006; Jacobsen & Jacobsen, 2006). One recent study found that the mother's IQ strongly predicted breastfeeding status, and that it was this which mediated the superior cognitive performances found among breastfed children (Der, Batty, & Deary, 2006). However, this study also suffered from methodological shortcomings, notably in the definition of breastfeeding employed in the research. Women were asked only whether they had breastfed their child at all, and if so, how old the child was when they stopped breastfeeding. These data do not take into account the dose response relationship frequently identified as being of importance in attaining the full benefits of breastfeeding. Additionally, data were collected retrospectively, sometimes more than a year after the child's birth (Der, Batty, & Deary, 2006), when the mother may have difficulty remembering the exact time of weaning. Due to these research design limitations, the exact nature of the relationship between infant feeding method and cognitive function is still unclear.

Research has also identified numerous negative health outcomes to women who artificially feed (Labbok, 1999, 2001; NHMRC, 2003). These studies have found that artificially feeding women have a less rapid involution of the uterus following birth, leading to an increase in postpartum blood loss. The studies also show that artificially feeding women return to fertility more quickly, thereby denying them a natural method of child spacing and a reduction in lifetime menstrual blood loss. Other research suggests that artificially feeding women may have a higher risk of ovarian cancer (Labbok, 2001) and breast cancer (Collaborative Group on Hormonal Factors in Breast Cancer, 2002; Hollander, 2002), and a higher risk of hip, vertebrae and humerus fracture (Cumming & Klineberg, 1993; Kalwart & Specker, 1995). Finally, Papinczak and Turner (2000) found that the mother's level of self-esteem increased with longer breastfeeding durations, suggesting that the mental and emotional health of the woman may be affected by the manner in which she feeds her infant. The NHMRC's 2003 Dietary Guidelines for Children and Adolescents

included a summary of the health advantages of breastfeeding for infants and mothers accepted by the NHMRC at that time, this information is included as Table 1.2.

Table 1.2

Risks Associated with Artificial Feeding for Mothers and Babies

Infant	Mother
• Increased incidence and duration of diarrhoeal illnesses • Higher risk of respiratory infection and increased prevalence of asthma • Increased occurrence of otitis media and recurrent otitis media • Possible higher risk of neonatal nectrotising enterocolitis, bacteraemia, meningitis, botulism and urinary tract infection • Possible higher risk of auto-immune disease, such as type 1 diabetes and inflammatory bowel disease • Increased risk of developing cow's milk allergy • Possible increased risk of developing adiposity later in childhood • Decreased visual acuity and psychomotor development • Lower IQ scores, which may be the result of missing out on factors present in breastmilk or of lesser stimulation • Increased malocclusion as a result of better jaw shape and development	• Slower maternal recovery from childbirth – slower uterine involution and increased risk of haemorrhaging (thus increasing maternal mortality) and loss of maternal haemoglobin stores through increased blood loss, leading to reduced iron status • Lack of the normally prolonged period of post-partum infertility, leading to shorter spacing between pregnancies • Possible slower weight loss and return to pre-pregnancy body weight • Increased risk of pre-menopausal breast cancer • Possible increased risk of ovarian cancer • Possible worsened bone mineralization, thereby increasing the risk of post-menopausal hip fracture

Note. Adapted from Dietary Guidelines for Children and Adolescents in Australia (NHMRC, 2003)

While these health consequences for the mother and baby are of concern globally, babies and mothers in developing countries face additional concerns with regard to artificial feeding. In addition to problems accessing clean water supplies, fuel and safe alternative foods for artificially fed infants, in some countries the child spacing effect of breastfeeding is said to provide more contraceptive protection than all modern methods combined. Research repeatedly finds that breastfeeding is the single most effective method of limiting conception in countries without access to birth control (Baumslag & Michels, 1995). Baumslag and Michels contend that promoting increased child spacing through Exclusive breastfeeding can prevent up to one-fifth of infant deaths in countries where brief birth intervals are associated with an increased risk of maternal and child mortality.

Artificial feeding also has implications for the environment. While breastmilk is a renewable, pollution free resource, the production and use of artificial formulas carries heavy environmental costs. Direct waste includes an estimated 450 million metal cans disposed of each year for every three million babies bottle-fed (Stuart-Macadam & Dettwyler, 1995). This is in addition to the disposal of promotional materials; packaging; rubber, plastic and silicon used in bottles and teats; sterilising fluids and sanitary products (most lactating women do not menstruate; Radford, Rickett, & Williams, 1998). Formula manufacture also necessitates the production and consumption of energy and the environmental costs associated with its shipment, sometimes across the world (Minchin, 1993). Additionally, as most artificial baby milk is created from heat-treated cows milk converted into powder, there are many environmental costs associated with the dairy industry, including deforestation to create pasture, methane from cows and algal blooms in rivers and streams caused by the use of fertiliser to grow feed for cows (Radford, 1992).

However, it is the economic impact of artificial feeding which may hold the key to attracting the funding needed for continued breastfeeding research and to provide services to assist breastfeeding women. Due to difficulties with quantifying many of the impacts of artificial feeding, most researchers in the area focus on the reduction in health care costs associated with a limited number of specified childhood illnesses in infants who are breastfed (Hector, Webb, & Lymer, 2004). These economic costs typically exclude the cost of numerous chronic and common illnesses for which breastfeeding has a protective effect, as well as out of hospital healthcare costs. While costs arising from these studies are large, these estimates are

therefore considered an underestimate of the true economic impact of artificial feeding.

In the 1990s, and based on only four illnesses for which breastfeeding is known to have a protective effect, Drane (1997) found that a minimum of $11.5 million could be saved in Australia each year by increasing the Exclusive breastfeeding rate at 3 months from 60% to 80%. Following this, Smith (2001) estimated the costs (based on five illnesses) of weaning 30% of infants to formula by 3 months at around $290 million a year. Another Australian analysis (based on the same five illnesses) placed the attributable hospital costs of early weaning in the Australian Capital Territory alone at about $1 to $2 million a year (Smith, Thompson, & Ellwood, 2002). Adapting this 2002 research to the state of New South Wales, Hector et al (2004) estimate that the cost of not breastfeeding, or breastfeeding Exclusively for only short durations, costs a minimum of $20 to $40 million a year in New South Wales.

On an individual scale, Riordan (1997) describes how family budgets also suffer, with formula costing the average family twice the cost of any supplemental food for the mother associated with breastfeeding (see also Anholm, 1986). The United States Breastfeeding Committee (2002) estimates that $US2 billion per year is spent by American families on breastmilk substitutes. In Third World countries where the cost of formula feeding can be more than the family's combined income, the impact of formula purchases on the family can be crippling (Leon-Cava, Lutter, Ross, & Martin, 2002; Minchin, 1989).

1.3.1 Contraindications for Breastfeeding

Research suggests that few women are physically unable to breastfeed, and that there are few situations where breastfeeding should be discouraged (Brodribb, 2006). With regard to problems with the physiology of the breast itself, Brodribb outlines research suggesting rare occurrences of an apparently congenital lack of glandular tissue in the breast, and incidences of damage to breast tissue caused by breast surgery or mastectomy which may adversely impact on breastfeeding outcome. She encourages single-sided breastfeeding where only one breast is affected. Hormonal abnormalities in the mother may also adversely affect breastfeeding outcome, but again this is relatively rare (Zargar, Masoodi, Laway, Shah, & Salahudin, 1997).

Some disease situations may also contraindicate breastfeeding. In countries where there is access to safe, affordable breastmilk substitutes, women with HIV infection are encouraged not to breastfeed (NHMRC, 2003). Women suffering from the Human T-cell leukaemia virus (HTLV-1), which may possibly be transmitted from mother to infant through breastmilk, should also be encouraged not to breastfeed (Hino et al., 1997). Breastfeeding is also contraindicated in users of illicit drugs including cannabis, cocaine and heroin (Hale, 2002). However, most prescribed medications required by mothers are compatible with breastfeeding after each drug is carefully and specifically checked with a reliable reference (Division of Mental Health & St George Hospital and Community Health Services, 2004; Ito, 2000).

Finally, some babies with conditions such as Pierre Robin syndrome, cleft lip and/or palate, or certain neurological conditions may find it physically difficult to feed from the breast (Neifert & Seacat, 1986). However with patience and appropriate support many mothers do manage to breastfeed these babies, while others may choose to express breastmilk for the baby which can be delivered by nasogastric tube, bottle or cup (Brodribb, 2006).

1.4 The Optimal Duration of Breastfeeding

While the weight of the evidence supporting the need for Exclusive breastfeeding in a large majority of individuals is strong (Raisler, Alexander, & O'Campo, 1999; Talayero et al., 2006), there was once considerable debate on its optimal duration (WHO, 2001). Consequently, the World Health Organisation (WHO, 2001) commissioned a systematic review of the published literature relevant to the impact of Exclusive breastfeeding duration, with over 3,000 references identified for independent review and evaluation. The results of this review were further debated at the 54th World Health Assembly in May 2001, resulting in a change in the recommended duration of Exclusive breastfeeding from “4 to 6 months” to “6 months” of age (Duff, 2001, p. 323). The Expert Consultation recommended Exclusive breastfeeding for 6 months, with complementary foods introduced in addition to breastfeeding thereafter (WHO, 2001). A more recent Cochrane review (Kramer & Kakuma, 2003) supported this decision, and 2003 saw the Dietary Guidelines for Australian Children and Adolescents (NHMRC, 2003)

increase the recommended duration of Exclusive breastfeeding in Australia to “6 months”, from the previously recommended “4 to 6 months” of age.

Exclusive breastfeeding to this age is still infrequent in most countries however, and increased education and support for breastfeeding mothers may be required before real increases in Exclusive breastfeeding duration are seen. The WHO (2001) also notes that this recommended duration applies to populations rather than to individual cases, and recognises that some mothers will be unable to, or choose not to, follow this recommendation. Similarly, the National Health and Medical Research Council (NHMRC) states that while Exclusive breastfeeding to 6 months should be the aim for every infant, if this is not possible mothers should instead be encouraged to breastfeed for as long as they can (NHMRC, 2003).

While the focus of this WHO debate was Exclusive breastfeeding duration, breastfeeding beyond 6 months is of continuing value to the baby even after supplemental foods are added to the diet (NHMRC, 2003). The NHMRC and the WHO recommend that nutritionally adequate and safe complementary foods be added to breastmilk in the baby’s diet at around 6 months of age, to meet their changing nutritional requirements (WHO, 2002). After complementary foods are introduced, the WHO (2002) recommends that breastfeeding continues for up to 2 years of age or beyond, and that women be provided with access to the support they require to continue breastfeeding. Australia’s NHMRC recommendations differ slightly, in that they include continued breastfeeding until 12 months of age, or longer if both mother and baby wish (NHMRC, 2003).

1.6 Significance of the Problem

Evidence presented in this chapter demonstrates that the problem addressed by this study (Section 1.0) has intrinsic importance, as it affects the health and wellbeing of the population. The health benefits of breastfeeding have been acknowledged by Australia’s NHMRC. The NHMRC regard the promotion of breastfeeding as an important public health strategy, and one that may contribute to the health of all Australians from birth (NHMRC, 2003). At a time when Australian health services are struggling to meet population health service demands while adhering to a restrictive health budget, the economic savings which would result from an increase in the duration of breastfeeding are also significant. These savings

may relieve some of the pressure on health service budgets, and lead to improved access to health care for all Australians.

The focus on psychological factors in the current study may add to its potential to contribute to a reduction in early weaning, largely because many psychological factors are thought to be modifiable (e.g., Bandura, 1995). Most previous research into breastfeeding determinants has focussed on socio-demographic influences, many of which are not amenable to modification and offer little potential for increasing breastfeeding duration. Previous studies into the psychological factors influencing breastfeeding duration are rare, and most have tended to focus on a restricted number of specified psychological differences between women as part of a larger design. Few of these studies have attempted to measure the psychological characteristics of women using validated tools or a prospective design, and no evidence could be found of research which has used qualitative data from breastfeeding women to make decisions about which factors should be included. This study, therefore, will redress some of the shortcomings of previous research in the area and yield some useful findings which will contribute to the search for solutions to the problem being addressed.

1.7 Study Objectives

Phase 1 of this study aims to bring together information gained from breastfeeding women, breastfeeding clinicians and the extant literature to construct a list of psychological factors thought to influence the duration of breastfeeding. Those factors from this list which the evidence suggests have the greatest impact on the duration of breastfeeding will be selected for further investigation in Phase 2.

Phase 2 of the study aims firstly to identify the relationship between the selected psychological factors and the duration of breastfeeding. This quantitative phase of the study also aims to discover what (if any) contribution these psychological factors make to the prediction of breastfeeding duration, when compared to the less modifiable socio-demographic and other factors currently predominating in the literature. Finally, Phase 2 aims to discover which of the factors under investigation are most important to the prediction of breastfeeding duration, and which (if any) may be unique predictors of the duration of breastfeeding after other factors in the design have been taken into account.

1.8 Organisation of the Dissertation

Following this introductory chapter a review of the literature relevant to the determinants of breastfeeding will be presented including the demographic, hospital, social and psychological influences on the duration of breastfeeding which have been identified in the research thus far. The methodology underlying the current research will then be briefly described (Chapter Three), followed by a description of the methods employed in Phase 1 (Chapter Four). The results of Phase 1 will be presented and discussed in Chapter Five. Chapter Six will outline the methods used in the conduct of Phase 2. The results of Phase 2 will be presented in Chapter Seven, and a discussion of the overall study results will be the topic of Chapter Eight. The final chapter will provide a discussion of the research and clinical implications of the study findings, and a synthesis of the major findings arising from the study.

It isn't what people think that is important, but the reason they think what they think

E. Ionesco

Chapter Two: Breastfeeding Determinants

2.0 Introduction

The previous chapter presented evidence for the benefits to be attained by increasing the duration of breastfeeding in Australia to meet WHO and NHMRC guidelines (NHMRC, 2003; WHO/UNICEF, 1989). In order to reach this goal, previous authors have highlighted the importance of linking interventions to the determinants of breastfeeding, and recommend that interventions should be designed to address one or more known contributing factors if substantial and sustainable change is to occur (Green, 1999; Hector, King, & Webb, 2004; National Public Health Partnership, 2000). The current study is designed to increase our knowledge of these determinants, specifically in the little researched area of the psychological factors influencing breastfeeding duration. Breastfeeding is an apparently complex process, and decades of previous research have demonstrated the effect of numerous factors which influence its duration. This chapter will therefore outline the findings of previous research using categories which separate factors according to the socio-demographic characteristics of the mother and her family, hospital and health system practices, maternal behaviours, other maternal characteristics, socio-cultural, economic and environmental factors and finally, psychological factors. For the sake of brevity, the focus of this review will be on research into the major factors influencing the duration of breastfeeding, largely omitting research which focuses on the initiation of breastfeeding only.

2.1. Socio-demographic Factors

The first category to be discussed contains the socio-demographic determinants of breastfeeding duration. Though the majority of these factors are not easily modified, this area has attracted significant research interest in the past. Knowledge of the effect of these socio-demographic factors on breastfeeding duration provides us with an increased ability to identify mothers at risk of early weaning. These factors will now be discussed, and accompanied by a summary table at the end of this section (Table 2.1).

2.1.1 Maternal Age

The age of the mother has been consistently associated with breastfeeding duration (Callen & Pinelli, 2004). In general, mothers over the age of 25 are likely to breastfeed for longer than younger mothers (Kuan et al., 1999; Landers, Hughes, & Graham, 1998; Novotny et al., 2000; Weng, 2002). One Australian breastfeeding study (Boulton & Landers, 1999) found both maternal and paternal age to be significantly associated with the duration of breastfeeding. These authors reported that younger mothers were more likely to cease breastfeeding their infants before they reached 12 months of age than older mothers. The infants of younger fathers were also less likely to be breastfed at 12 months than those born to older fathers.

2.1.2 Marital Status

Research findings on the influences of marital status over breastfeeding duration are mixed. Some authors have found that married women breastfeed for longer durations than single women (e.g., Callen & Pinelli, 2004; Fitzpatrick, Fitzpatrick, & Darling, 1994; Hegney et al., 2003; Janke, 1998). In comparison, Hill and Aldag (1996) found no significant association between breastfeeding duration and marital status. Given current Australian cultural realities, it is also important to note that it is not marriage itself which may be influential, but living as married. Research suggests that there is no difference between married and defacto couples with regard to breastfeeding outcomes (Falceto, Giugliani, & Fernandes, 2004). MacGowan et al. (1987) found that women who were either married or living as married were three times more likely to be breastfeeding at 6 months than single women. These authors reported the results of a logistic regression revealing that the only variables significantly associated with breastfeeding were marital status (thus defined) and the mother's education.

2.1.3 Maternal Education

Statistically significant associations between the level of education achieved by the mother and the duration of breastfeeding have been reported by numerous authors both in Australia (Australian Bureau of Statistics, 2003; Boulton & Landers, 1999) and overseas (Callen & Pinelli, 2004; Kuan et al., 1999; Novotny et al., 2000; Riva et al., 1999). Locally, Boulton and Landers (1999) found that less educated mothers were more likely to cease breastfeeding prematurely than their more educated counterparts. In this study, 64.5% of infants born to mothers with tertiary

qualifications were still breastfeeding at 6 months, and 17.2% at 12 months, compared to 26.1% of infants at 6 months and 10.4% of infants at 12 months born to mothers who had not completed secondary schooling (Boulton & Landers). However, a study of 4438 newborns in the Netherlands (Bulk-Bunschoten, van Bodegom, Reerink, Pasker-de Jong, & De Groot, 2001) found that while a higher level of education was the most decisive factor in the initiation of breastfeeding, parity was the most decisive factor in its continuation.

2.1.4 Parity and Previous Breastfeeding Experience

While many studies have found a significant association between parity and length of breastfeeding (Bourgoin et al., 1997; Chen, 1993; O'Campo, Faden, Gielen, & Wang, 1992; Salt, Law, Bull, & Osmond, 1994), there are also numerous studies which do not support this conclusion (Amatayakul et al., 1999; Boulton & Landers, 1999; Kumar, Nath, & Riddaiah, 1989). The mixed nature of these results may be better understood when the effect of previous breastfeeding experience is taken into account.

Shiva and Nasiri (2003) found that while there was no significant effect of parity on breastfeeding duration in their study, the woman's previous breastfeeding experience significantly affected the pattern of feeding. Among the multiparous women who ceased breastfeeding their current child early, 83% had either not breastfed their previous child(ren), or had breastfed for a very short period. Other research into breastfeeding duration and previous breastfeeding experience has found similar results (Nagy, Orvos, Pál, Kovács, & Loveland, 2001; Novotny et al., 2000; Reifsnider & Eckhart, 1997).

Further differences in behaviour were found between primiparous and multiparous women when Humenick, Hill and Spiegelberg (1998) examined the nature of breastfeeding related contacts with health professionals. First time mothers in this study were likely to decrease their level of breastfeeding if a health professional encouraged supplements or weaning, while the level of breastfeeding of multiparae with at least 3 weeks experience in breastfeeding seemed independent of health care advice. However, multiparae with less than 3 weeks of previous breastfeeding experience showed the most rapid decrease in their breastfeeding rates, even with health care provider encouragement. These data suggest that the effect of

previous breastfeeding experience may be robust to intervention by a health professional.

2.1.5 Ethnicity

Like parity, the unique effect of ethnicity is also difficult to ascertain. However, research conducted in North America and Canada generally suggests that mothers from ethnic minorities are more likely than other mothers to cease breastfeeding prematurely (Ruowei & Grummer-Strawn, 2002; Shelton & Wang, 1997; Taveras et al., 2003; Weng, 2002). Also, the results of one Australian study suggest that there may be differences in infant feeding attitudes and breastfeeding duration rates between English, Arabic and Chinese speaking women (Homer, Sheehan, & Cooke, 2002). Homer, Sheehan and Cooke conducted this study in Sydney during 1997 and 1998, and showed that Arabic-speaking women had significantly longer breastfeeding duration rates compared with other women. These results also showed that while less Chinese-speaking women initiated breastfeeding, a greater proportion of those who did initiate were still breastfeeding at 8 weeks when compared with English-speaking women.

Other Australian studies have found no significant effect of ethnicity on breastfeeding behaviour (e.g., Landers, Hughes, & Graham, 1998). One such study into the characteristics of socio-economically disadvantaged Caucasian and Indigenous Australian mothers (Cox, 1981) found no significant differences between the infant feeding outcomes of the two groups, suggesting that differences observed in other studies may be the result of socio-economic status rather than ethnicity. Braveman, Cubbin, Marchi, Egerter and Chevez (2001) also voiced concern regarding the close correlation between race/ethnicity and socio-economic status. These authors also caution that any observed effect of race/ethnicity could vary with how socio-economic status is measured, and that these measurement difficulties should be taken into account when interpreting findings.

2.1.6 Socio-Economic Status

At present several varying measures for socio-economic status can be found in the literature including income, mother's and/or father's occupation, education and area of residence. This makes study results hard to compare and leaves researchers without a clear measure with which to quantify this important socio-demographic factor. It may therefore be advisable to interpret the significant

influence of socio-economic status on breastfeeding duration found in numerous international (Azaiza & Palti, 1997; Bourgoin et al., 1997; Mock, Bertrand, & Mangani, 1986; Piper & Parks, 1996) and Australian (Boulton & Landers, 1999; Cox, 1981; Lowe, 1993) studies with caution.

Nevertheless, there is some evidence that Australian women from the highest socio-economic groups are almost twice as likely to breastfeed for an extended period than women from the lowest groups (Nutbeam, Wise, Bauman, Harris, & Leeder, 1993). In Victoria, Lowe (1993) found that at 6 months post-partum the rate of breastfeeding ranged from 70.2% in upmarket Port Melbourne, to 22.7% in Sunshine, where unemployment is high and socio-economic status generally low. The 1995 National Health Survey also showed a strong relationship between socio-economic status and breastfeeding rates (Donath & Amir, 2000b). Infants from the most disadvantaged areas of residence were significantly less likely to be breastfed at discharge from hospital than infants from the three most advantaged quintiles. Also, rates of breastfeeding at 13 and 25 weeks were seen to decrease as the degree of disadvantage in the geographical area increased, indicating a clear gradient (Donath & Amir).

2.1.7 Place of Residence

Another demographic factor which may influence the duration of breastfeeding is area of residence. In the early 1980's Hitchcock, McGuiness and Gracey (1982) found significant differences in the duration of breastfeeding between rural and metropolitan mothers in Australia. While this affect was initially attributed to the fact that more metropolitan mothers belong to the higher socio-economic groups, an inspection of the data revealed a differing breastfeeding pattern for rurality than for the social class data. Specifically, while the effect of socio-economic status appeared relatively constant over time, country and city mothers had similar rates of breastfeeding at birth and again at 12 months, but during the months in-between the proportion of metropolitan mothers breastfeeding was considerably higher than that found in the country (e.g., metropolitan mothers' rates were 69% at 3 months and 50% at 6 months; country mothers rates were 55% at 3 months, and 35% at 6 months). This finding suggests that while a similar proportion of country and city mothers initiate breastfeeding, country mothers are more likely to cease breastfeeding early; however those who make it through the early period are likely to

persist to at least 12 months. This contention is supported by research which found that the number of women breastfeeding at 3 months in a South Australian rural community compared poorly with state and national figures (Stamp & Casanova, 2006). However, other research (Lowe, 1993) found that the proportion of infants being breastfed at 12 months was greater in all of the rural health regions in Victoria than in greater Melbourne. Evidence regarding differences in breastfeeding rates according to place of residence has also been found in other countries, suggesting differences in the feeding experiences of rural and urban mothers in countries as diverse as Hawaii (Novotny et al., 2000), China (Pasternak & Ching, 1986), North America (Weng, 2002) and Zaire (Mock, Bertrand, & Mangani, 1986).

Landers, Hughes and Graham (1998) compared their findings using a rural cohort with those seen in comparable urban studies, and found several differences in the factors associated with the risk of ceasing breastfeeding between the two groups, along with a lower rate of breastfeeding in the rural community. They suggested that the reliance on urban breastfeeding data may overestimate true breastfeeding rates in Australia when extrapolated to rural communities. Further research into the differing factors contributing to breastfeeding duration in Australian rural and urban communities is therefore long overdue (see Hughes, 1996).

Table 2.1

Summary of Socio-demographic Factors Influencing Breastfeeding Duration

Factor	Description and association
Maternal age	Mothers over the age of 25 tend to breastfeed for longer.
Marital status	Some evidence that married women and women in defacto relationships breastfeed for longer than single women, but findings are mixed.
Maternal education	More educated mothers are likely to breastfeed for longer than those with less education. Well established findings.
Parity	The number of previous children is sometimes associated with breastfeeding duration. Findings are mixed.
Previous feeding experience	The mother's previous infant feeding experience is often repeated with subsequent children. Consistent finding.
Ethnicity	In some countries ethnic minorities are at an increased risk of early breastfeeding cessation. However, any effect found in Australia seems likely to be more related to socio-economic status.
Socio-economic status	Higher socio-economic groups breastfeed for longer. This frequently found association is clouded by measurement difficulties and confounding variables.
Place of residence	Differences in breastfeeding duration by rural or urban residence have been found. More research is needed.

2.2. Hospital and Health System Practices

In addition to the woman's socio-demographic characteristics, various common hospital and birth practices have been found to influence the length of time for which a woman will breastfeed. Many of these practices may be modified or reduced, making this area a target for change if national breastfeeding rates are to be increased. A summary of these factors is provided in Table 2.2.

2.2.1 Caesarean Section

Various obstetric interventions have been found to have an effect on the incidence of breastfeeding, including operative birth. Statistics show that 29.3% of women who gave birth in Australian hospitals in 2003 had a caesarean section delivery (AIHW NPSU, 2005). This National survey recorded caesarean section rates of 30% or more in three Australian states including Western Australia, South Australia and Queensland, continuing the upward trend in caesarean rates which has been reported in Australia over the past 10 years (AIHW NPSU, 2005). While these national rates are significantly higher than the 10-15% recommended by the World Health Organisation, Australia is not the only country experiencing high rates of operative delivery (Dosa, 2001). Dosa reports caesarean section rates of approximately 22-24% in Britain and the United States, 40% in Chile and 22% in sub-Saharan Africa, and contends that up to 80% of women giving birth in Brazil's public hospitals deliver by caesarean. Any effect of operative delivery on breastfeeding duration is therefore an increasing cause for concern in both developed and developing countries.

The fatigue, pain and physical limitations commonly experienced following caesarean section are hypothesized to adversely effect the woman's initiation and maintenance of breastfeeding (Manhire, 2004). The literature also contains evidence that operative delivery may delay the time at which the milk "comes in", or lactogenesis (Kulski, Smith, & Hartmann, 1981). Some studies do show shorter durations of breastfeeding among women who give birth by caesarean section (Leung, 2002; Theofilogiannakou, 2006; Wang, 2006). Other results suggest that mothers who give birth by caesarean section are more likely to introduce supplements to their baby in the early days postpartum, thereby reducing the duration of Full breastfeeding (Giovannini, 2005; Mikiel-Kostyra, 2005). However, a link between caesarean delivery and breastfeeding duration is not always found in the research (De Lathouwer, 2004; Patel, Liebling, & Murphy, 2003), suggesting that more work needs to be done to confirm any adverse effect.

2.2.2 Analgesia

Other common birth practices including the use of labour analgesia have been studied for their effect on breastfeeding duration. While some authors have found that the use of epidural analgesia during labour and birth has no significant

effect on breastfeeding (Halpern et al., 1999; Nystedt, Edvardsson, & Willman, 2004), other studies suggest that receiving epidural analgesia may be associated with shorter breastfeeding durations (Chang, 2005; Clifford, Campbell, Speechley, & Gorodzinsky, 2006; Torvaldsen, Roberts, Simpson, Thompson, & Ellwood, 2006; Volmanen, 2004). The research also suggests that use of the drug Fentanyl in epidural anaesthesia may increase the risk to breastfeeding duration (Beilin, 2005; Jordan, 2005).

Analgesia administered through other routes is also a concern. Ransjo-Arvidson et al. (2001) contend that several types of analgesia given to mothers during labour may interfere with the newborn's spontaneous breast-seeking behaviours, and increase newborn body temperature and crying, and these factors may impact on the establishment of breastfeeding. The evidence for a link between analgesia and breastfeeding duration is still mounting however, and more work needs to be done in this area (Jordan, 2006).

2.2.3 Other Obstetric Interventions

Moxley, Brydon and Kennedy (1998) found that the more obstetrical interventions that occur during labour and delivery, the less likely it is that a woman will be breastfeeding at 6 weeks. The interventions most damaging to breastfeeding appeared to be those associated with trauma to the infant, (i.e. causing bruising of the head and excessive drowsiness), confirming other research which has found a link between early cessation of breastfeeding and forceps or vacuum assisted delivery (Leung, 2002). These findings are perhaps not surprising, given that the infant's sucking reflex is most intense in the first 20-30 minutes after birth, and that a delay in feeding due to drowsiness or trauma is thought to lead to an increased incidence of difficulties in establishing breastfeeding (Buxton et al., 1991; Moxley, Brydon, & Kennedy, 1998).

The level of intrusive obstetric interventions during labour and delivery has also been associated with the development of trauma symptoms in the mother following the birth (Creedy, 1999; Creedy, Shochet, & Horsfall, 2000). Childbirth events involving life threat and personal injury may trigger the onset of post traumatic stress disorder (PTSD) and subsequently, postnatal depression (Creedy, 1999). Any associated effect of these trauma symptoms on breastfeeding duration

should therefore be taken into account when considering the risks to breastfeeding posed by obstetric interventions.

2.2.4 Early Skin-to-Skin Contact

A possibly related variable is early skin-to-skin contact. Skin-to-skin contact between the mother and her newborn in the immediate post-natal period is thought to have many benefits, including the opportunity to capitalise on early infant reflexes (UNICEF, 2006). Porter (2004) contends that infant-mother bodily contact is the species-typical pattern of immediate postpartum child care. Following the birth, mothers and their newborns spontaneously engage in mutually beneficial interactions, during which maternal odours are thought to stimulate suckling. A recent Cochrane review (Anderson, Moore, Hepworth, & Bergman, 2006) found that skin-to-skin contact was associated with significant and positive effects on breastfeeding at 1-3 months after the birth, and on breastfeeding duration. This review also revealed some evidence that early skin-to-skin contact was associated with improved scores for maternal affectionate love/touch during observed breastfeeding during the first few days after the birth, and with maternal attachment behaviour.

However, routine early skin-to-skin contact has proven difficult to achieve in many countries (UNICEF, 2006). Following the birth of a baby, necessary medical procedures such as repair of episiotomy, in addition to routine labour ward practices such as cleaning of the newborn and weight/length measurements, can delay early contact between the mother and her newborn (Awi, 2006). This is especially true among women who give birth by caesarean section. In a recent investigation of breastfeeding determinants conducted in Athens hospitals, only 3% of women initiated breastfeeding within one hour of the birth (Theofilogiannakou, 2006).

2.2.5 Length of Hospital Stay

The length of hospital stay has also been frequently studied for its effect on breastfeeding duration. Some research has found that longer hospital stays hold an advantage to breastfeeding mothers (e.g., Heck, Schoendorf, Chavez, & Braveman, 2003). However, results are mixed and others have found no difference in the breastfeeding durations of women with short or long hospital stays (Brown, Bruinsma, Darcy, Small, & Lumley, 2004; Brown & Lumley, 1997; O'Leary, Koepsell, & Haller, 1997) or return inconclusive results (Brown, Small, Faber,

Krastev, & Davis, 2003). A 1997 meta-analysis (Venditelli & Boulvain) of randomized clinical trials suggested that, despite evidence that women in these studies seemed to prefer a longer hospital stay, there may in fact be an advantage to breastfeeding from an early discharge policy. However, these results must be interpreted with caution, as the studies included were of small sample size or were rather old.

The mixed nature of these findings means that we still have much to learn about the optimal duration of postnatal hospital stays. It is known that many women will have difficulties with issues such as attachment, nipple soreness and breast engorgement in the early days following the birth (Brodribb, 2006). It is also thought that health system support of breastfeeding women is an important factor in their success, and as such should not be confined to the hospital setting, but extend into the post-discharge period (Kuan et al., 1999).

2.2.6 Rooming-In

Another hospital practice thought to influence breastfeeding success is rooming-in. The practice of rooming-in is common in Australian hospitals, and generally involves placing the infant in a cot beside the mother's bed, and allowing the mother to care for her baby during her hospital stay (Rice, 2000). Infants who room-in with their mothers have been found to cry less, and have higher weight gains and less formula supplementation than those who spend some of their time in the hospital nursery (Yamauchi & Yamanouchi, 1992). This improved weight gain may be explained in part by the more frequent suckling observed among infants who are rooming-in, thereby reducing energy consumption through reduced movement and crying during the first days of life (Yamauchi & Yamanouchi). The more frequent suckling associated with rooming-in may also aid in the establishment of breastfeeding (Hornell, Aarts, Kylberg, Hofvander, & Gebre-Medhin, 1999). This may partially explain the longer breastfeeding durations observed among women who are not separated from their babies in the early days after the birth (Buxton et al., 1991; Centuori et al., 1999; Hewat & Ellis, 1986; Scott, Landers, Hughes, & Binns, 2001a; Whelan & Lupton, 1998).

However, the practice of rooming-in is not universally accepted. For example, a recent study involving several maternity hospitals in Athens found that the private hospitals studied did not practice rooming-in (Theofilogiannakou, 2006).

In Australian hospitals, one research team found that while rooming-in was encouraged in all participating hospitals, only 37% of women chose to keep their baby with them for 24 hours a day (Scott, Landers, Hughes, & Binns, 2001a). The research team reported that this decision was usually made by participants out of consideration for women in the shared room/ward. However, other Australian research suggests that cultural practices and beliefs may also prompt the mother to reject rooming-in, particularly among Asian women (Rice, 2000). Rice found that women whose cultural beliefs differed from Western norms sometimes wished to observe their cultural practices such as "good rest" and avoidance of physical activities, in order to regain health and strength after the birth. These cultural expectations made rooming-in seem inappropriate to some, and resulted in conflict between mothers and ward staff (Rice).

2.2.7 Formula Supplementation in the Maternity Unit

Finally, formula supplementation in the maternity unit has been found to adversely effect the duration of breastfeeding (Feinstein, Berkelhamer, Gruszka, Wong, & Carey, 1986; Whelan & Lupton, 1998). Italian researchers studied 1601 mothers over 12 months, and found that 30% of babies received breastmilk supplementation in the maternity ward. Mothers in this study whose babies received supplements breastfed for shorter durations than those whose babies had not received supplements (Riva et al., 1999). More recent investigations in Athens found that almost 90% of infants were given breastmilk substitutes one or more times during the first 2 days in the maternity hospital (Theofilogiannakou, 2006), pointing to an increase in this potentially damaging practice in some developed countries.

Table 2.2

Summary of Hospital Practices Influencing Breastfeeding Duration

Factor	Description and Association
Caesarean section	Caesarean birth may place breastfeeding at risk. Inconsistent findings.
Analgesia	Possible negative effect of labour analgesia on breastfeeding duration. Inconsistent findings.
Other obstetric interventions	Interventions associated with trauma to the infant, bruising of the head or drowsiness may place breastfeeding at risk. Limited but consistent findings.
Early skin-to-skin contact	Early skin-to-skin contact is associated with improved breastfeeding outcomes. Consistent finding.
Length of hospital stay	Research into the effect of length of hospital stay on breastfeeding duration has resulted in mixed findings.
Rooming-in	Rooming-in is associated with increased breastfeeding duration but is not widely practiced. Consistent finding.
Formula supplementation	Supplements given to the baby in the maternity ward can have an adverse effect on breastfeeding duration. Consistent finding.

2.3. Maternal Behaviours

Several factors associated with the mother's personal and parenting behaviours are also associated with breastfeeding duration. These factors (summarized in Table 2.3) may be amenable to modification through appropriate education, support and counselling.

2.3.1 Smoking

One such maternal behaviour is cigarette smoking. Smoking of cigarettes has been repeatedly found to be a significant predictor of early weaning (Boulton & Landers, 1999; Clements et al., 1997; Edwards, Sims-Jones, & Breithaupt, 1998; Fitzpatrick, Fitzpatrick, & Darling, 1994; Hill & Aldag, 1996; Hornell, Aarts, Kylberg, Hofvander, & Gebre-Medhin, 1999; Scott, 2006; Yilmaz, Gurakan, Akgun, & Ozbek, 2002). A longitudinal study of 500 women (Najdawi & Faouri, 1999)

found that breastfeeding prevalence decreased significantly among smokers but not among non-smokers in the sample. This finding is supported by other research which tracked breastfeeding mothers who had stopped smoking for pregnancy (Ratner, Johnson, & Bottorff, 1999). These researchers concluded that early weaning may result from psychological or physiological changes associated with tobacco use. After controlling for intended duration of breastfeeding, education, and return to paid employment, women who resumed daily smoking in this study were almost four times more likely to wean early than those who abstained or smoked only occasionally.

The association between maternal smoking and lack of breastfeeding therefore appears to be consistent across different study designs and different countries, however it cannot be assumed that the link between smoking and breastfeeding is a physiological one (Amir & Donath, 2002). Women who smoke have been found to be less likely to intend to breastfeed (Donath, Amir, & ALSPAC Study Team, 2004) or to initiate breastfeeding (Leung, 2002) than non-smoking women. This has led some authors to suggest that the lower breastfeeding durations found among women who smoke may be more due to lower motivation to breastfeed than any physiological effect of smoking on their milk supply (Donath, Amir, & ALSPAC Study Team).

2.3.2 Frequency of Feeds

Another behaviour which has been linked to breastfeeding duration is the frequency of feeds. Social historians believe that many of the breastfeeding problems which mothers experienced between the 1950's and 1970's were due to the emergence of an arbitrary time schedule for infant feeding (Katz Rothman & Simonds, 2003). The idiosyncratic rhythms of breastfeeding mothers and babies meant that breastfeeding was very difficult to establish on a schedule of four-hourly feeds and no night feedings (Katz Rothman & Simonds). "Demand" feeding was therefore proffered as an alternative, and represents a return to offering unrestricted access to the breast in response to the baby's cues. Some studies have found that infants who breastfeed on demand are breastfed for longer than those who feed to a schedule (Centuori et al., 1999; Landers, Hughes, & Graham, 1998). Feeding more frequently during establishment, as may be expected with demand feeding, has also been associated with longer breastfeeding duration in research conducted in Canada

(Hewat & Ellis, 1986) England (Whelan & Lupton, 1998) and Sweden (Hornell, Aarts, Kylberg, Hofvander, & Gebre-Medhin, 1999).

2.3.3 Pacifier Use

Step nine of the 'ten steps to successful breastfeeding' outlined in the UNICEF UK Baby Friendly Hospital Initiative advises that no artificial teats or pacifiers be given to breastfed babies, because of their perceived interference with breastfeeding (WHO/UNICEF, 1989). Research has frequently found daily pacifier use to be associated with shorter breastfeeding duration (Clements et al., 1997; Hornell, Aarts, Kylberg, Hofvander, & Gebre-Medhin, 1999; Howard et al., 1999; Mikiel-Kostyra, 2005; Riva et al., 1999; Victora, Tomasi, Lonto, & Barros, 1993; Vogel, Hutchison, & Mitchell, 1999, 2001), though the question of whether pacifier use is itself harmful to breastfeeding, or merely a marker of existing breastfeeding difficulties is difficult to answer.

Kramer et al. (2001) conducted a double-blind, randomised controlled trial wherein participants were assigned to one of two counselling interventions. Groups differed in that mothers in the experimental intervention (n = 140) were recommended to avoid pacifiers and were given suggestions for alternative ways of comforting a crying or fussing infant, while the control group (n = 141) did not receive these suggestions or advice. Unfortunately the sample size was rather small and the time invested by a lactation counsellor needs to be considered when interpreting these results. However, the reduction in pacifier use by the experimental group did not significantly affect breastfeeding outcomes, prompting the authors to suggest that pacifier use may be a marker of breastfeeding difficulties or reduced motivation to breastfeed. Supporting this, difficulties including sore nipples (Centuori et al., 1999) and an incorrect sucking technique on the part of the baby (Righard, 1998; Righard & Alade, 1992) have been associated with regular pacifier use, as has infrequent feeding (Howard et al., 1999). Findings such as these prompted one author to suggest that some mothers successfully used a pacifier as an aid to weaning their baby (Victora, Behague, Barros, Olinto, & Weiderpass, 1997).

Recent research into the incidence of Sudden Infant Death Syndrome (SIDS) has shown that the use of pacifiers is associated with an approximate halving of the risk of SIDS (Mitchell, Blair and L'Hoir, 2006). These findings have been consistent across studies conducted in many countries even after adjusting for potential

confounds. This suggests that it may be appropriate to stop discouraging the use of pacifiers, despite their potential disadvantages. A meta-analysis of seven studies undertaken by Hauck (2005) concluded that pacifiers should be offered to infants for use during all sleep episodes including daytime naps and night time sleeps. In order to reduce any potential detrimental effects of pacifier use, the author suggests that pacifiers be used only for the first twelve months (when the risk of SIDS is greatest), and that breastfed infants be offered a pacifier only after breastfeeding has been well established.

2.3.4 Early Introduction of Solids

Finally, research suggests that complementary foods offered to infants before 6 months of age tend to displace breastmilk without conferring any growth advantage over Exclusive breastfeeding (Dewey, 2001). Accordingly, WHO and NHMRC guidelines recommend that solid foods not be introduced to the infant until at least 6 months of age (NHMRC, 2003; WHO, 2001). However, many women continue to introduce solids to their baby before this time, placing breastfeeding at risk. After considering numerous factors, the weight of solid foods consumed by the baby at 6 months of age was found to hold the strongest negative association with breastfeeding duration in one Australian study (Boulton & Landers, 1999). Other research has also associated the early introduction of solids with shorter breastfeeding durations (Bourgoin et al., 1997; Novotny et al., 2000), but the evidence also suggests that introduction of solids before the recommended minimum age is common practice. This contention was backed by one New Zealand study, which found that 45% of babies in the sample were given non-milk foods before 4 months of age (Heath, Tuttle, Simons, Cleghorn, & Parnell, 2002).

Table 2.3

Summary of Maternal Behaviours Influencing Breastfeeding Duration

Factor	Description and association
Smoking	Women who smoke cigarettes are likely to wean earlier than those who do not, though this finding may not be associated with any physiological effect.
Frequency of feeds	Demand feeding and frequent feeds during the establishment of breastfeeding are consistently associated with longer breastfeeding durations.
Pacifier use	Daily pacifier use is consistently associated with shorter breastfeeding duration, but may be a marker of underlying breastfeeding difficulties.
Early introduction of solids	Complimentary foods introduced to the infant before six months tend to displace breastmilk and lead to early weaning. Consistent finding.

2.4. Other Maternal Characteristics

In addition to the socio-demographic characteristics and specific maternal behaviours outlined in the previous sections, other maternal characteristics have been associated with the duration of breastfeeding including the woman's level of intelligence, obesity, early breastfeeding problems and level of breastfeeding knowledge. The effects of these characteristics can be found summarised in Table 2.4.

2.4.1 Maternal IQ

The mother's intelligence (measured as intelligence quotient, or IQ) has been named as a confounder in some investigations of the effect of breastfeeding on the child's intelligence (Angelsen, Vik, Jacobsen, & Bakketeig, 2001; Johnson, 1996). During these investigations, it was discovered that the mother's IQ is associated with breastfeeding duration, such that mothers with higher IQ scores are more likely to breastfeed for longer durations. In fact, a recent study of over 3,000 mothers concluded that the mother's IQ was more highly predictive of breastfeeding status than were her race, education, age, poverty status, smoking, the home environment, or the child's birth weight or order (Der, Batty, & Deary, 2006).

2.4.2 Maternal Obesity

A second maternal characteristic associated with breastfeeding duration is that of maternal obesity or high body mass index. Investigators in many different populations of women have reported shorter durations of breastfeeding in obese women (Donath & Amir, 2000a; Forster, McLachlan, & Lumley, 2006; Locke, 2006; Lovelady, 2005; Theofilogiannakou, 2006). For example in Australia, Oddy (2006) found that women who were overweight or obese pre-pregnancy were more likely to have discontinued breastfeeding at any time before 6 months than normal weight women, even following adjustment for potential confounds. While more research into the reasons for this increased risk is required, Rasmussen (2004) found that overweight and obese women have a lower prolactin response to suckling. He concluded that this reduced response may be expected to compromise the ability to produce breastmilk, and over time could lead to the premature cessation of breastfeeding due to low breastmilk supply.

2.4.3 Early Breastfeeding Problems

One maternal characteristic that is less clear in its association with breastfeeding duration is the experience of breastfeeding problems. Several authors have reported shorter breastfeeding durations among women who experience early breastfeeding problems (McLeod, Pullom, & Cookson, 2002; Scott, 2006; Taveras et al., 2003), and mothers frequently report problems as the reason for early breastfeeding cessation (e.g., Binns & Scott, 2002). Specifically, nipple problems (e.g., cracked or sore nipples) have been associated with early weaning (Cernadas, Noceda, Barrera, Martinez, & Garsd, 2003) and are commonly given as a reason for early weaning by mothers (Rentschler, 1991). Similarly, breast problems (e.g., leaking, engorgement) have also been associated with shorter breastfeeding durations (Novotny et al., 2000), and are commonly cited as a reason for early weaning by mothers (Bourgoin et al., 1997; Chan, Nelson, Leung, & Li, 2000). However, the association is not as clear-cut as it may initially appear.

One author who investigated the association between mastitis and the duration of breastfeeding found that women who experienced mastitis were in fact at a reduced risk of early weaning (Vogel, Hutchison, & Mitchell, 1999). Similarly, Fahy and Holschier (1988) found that the frequency of breastfeeding problems was actually higher among the successful breastfeeding mothers than it was among those

who weaned early. These authors concluded that successful breastfeeding may therefore not be the result of a problem-free postnatal period, but more about the mother's ability to accept and deal with problems as they arise. This contention is supported by Voellmy (1987), who found that women in the study who breastfed for longer durations (more than 20 weeks) reported about the same amount of breastfeeding problems as those who weaned early (before 20 weeks). However, Voellmy notes that while the number of problems was about the same, the continuing women tended to view these problems as less severe, were more positive and considered breastfeeding to be easy. These findings may be associated with optimism, discussed further in Section 2.6.15.

2.4.4 Breastfeeding Knowledge

Finally, the woman's breastfeeding knowledge has been linked with breastfeeding duration, but these results are not easily interpreted. Much of the research in this area involves the provision of breastfeeding education and training to mothers and/or fathers and subsequent comparison with a control. As there are large differences in the amount, delivery and quality of information and training provided to participants, comparison of the results of trials such as these is difficult. However, several researchers have found a positive relationship between attendance at a breastfeeding class and a longer duration of breastfeeding (Arlotti, Cottrell, Lee, & Curtin, 1998; Chezem, Friesen, & Boettcher, 2003). One Brazilian study (Susin et al., 1999) reported that the mothers in their trial who had the highest level of breastfeeding knowledge had a 6.5 times higher chance of Exclusively breastfeeding at the end of the third month, and a 1.97 times higher chance of continuing to breastfeed to the end of the sixth month compared with other mothers. However, the results are not universal, and a 1997 controlled trial conducted by Reifsnider and Eckhart (1997) observed no significant effect of breastfeeding class attendance. A second randomized controlled trial conducted in Australia found no differences in breastfeeding outcomes when they compared the infant feeding methods of women who had attended mid-pregnancy interventions including either (1) a 1.5 hour class on the practical aspects of breastfeeding; (2) two 1 hour classes exploring family and community attitudes toward breastfeeding or (3) no intervention controls (Forster, McLachlan, Lumley, Beanland, Waldentrom & Amir, 2004). Despite these mixed results, there is some tentative evidence that the provision of breastfeeding education

is the most effective primary care based intervention to improve breastfeeding initiation and duration rates (Guise et al., 2003). However, the timing of the delivery of this breastfeeding information may be important.

Sword and Watt (2005) examined newly-delivered women's concerns at the time of hospital discharge, and compared these to self-identified unmet learning needs at 4 weeks after discharge. Breastfeeding was among the most frequently cited concerns while in hospital, and was also commonly identified as an unmet learning need at 4 weeks post-discharge. For almost all topics including breastfeeding, significantly more women identified learning needs at 4 weeks after discharge compared with the number who identified corresponding concerns while in hospital. This study suggests that the women initially felt prepared to deal with the realities of motherhood, but that knowledge gaps became more apparent after a period of adjustment at home. Most hospital based parenting and breastfeeding classes in Australia are currently offered antenatally. However, the results of Sword and Watt's study suggest that breastfeeding information may be better received in the postnatal period. This contention is backed by the results of a systematic review which found that interventions offered either postnatally or spanning both the postnatal and prenatal period were most effective in increasing the duration of breastfeeding (De Oliveira, Camacho, & Tedstone, 2001).

Table 2.4

Summary of Other Maternal Characteristics Influencing Breastfeeding Duration

Factor	Description and association
Maternal intelligence	There is a positive association between maternal intelligence and breastfeeding duration. Consistent finding but few studies have been conducted to date.
Maternal obesity	Overweight or obese women have been found to breastfeed for shorter durations than normal weight women. Consistent finding.
Early problems	While some studies associate early breastfeeding problems with shorter breastfeeding durations, others find that the opposite is true. More research is needed in this area.
Breastfeeding knowledge	Study findings are mixed and more controlled research using standardized and replicable educational interventions is required before conclusions can be drawn. Some evidence that education interventions are most effective if delivered in the postnatal period (or spanning both ante- and postnatal periods).

2.5. Socio-Cultural, Economic and Environmental Factors

In addition to the characteristics of the mother and the hospital environment discussed thus far, some socio-cultural, economic and environmental factors have been found to influence breastfeeding duration. Factors in this group must be considered open to modification, though in many cases the progress of social change can be expected to be slow. These factors are summarised in Table 2.5.

2.5.1 Early Return to Employment

Focus groups designed to identify perceived barriers to breastfeeding among antenatal Irish women found that one of the main barriers identified by group members was the return to paid employment (Stewart-Knox, Gardiner, & Wright, 2003). Similar results were achieved in Australia, where adult community members reported a common belief that it is not possible to combine breastfeeding with the

return to paid work (McIntyre, Hiller, & Turnbull, 1999). These results suggest that many women believe that paid work and breastfeeding are mutually exclusive, and research on breastfeeding duration supports this belief. While the findings are not entirely consistent (e.g., Kumar, Nath, & Riddaiah, 1989; Shiva & Nasiri, 2003), the bulk of research in the area has found that maternal return to work is associated with earlier weaning (Arlotti, Cottrell, Lee, & Curtin, 1998; Bourgoin et al., 1997; Bulk-Bunschoten, van Bodegom, Reerink, Pasker-de Jong, & De Groot, 2001; Hill, Humenick, Argubright, & Aldag, 1997; Novotny et al., 2000; Pasternak & Ching, 1986; Scott, 2006; Taveras et al., 2003; Visness & Kennedy, 1997), or a shorter duration of Full breastfeeding (Khassawneh, Khader, Amarin, & Alkafajei, 2006; Pechlivani, 2005).

While the evidence for an effect of actual return to work on breastfeeding duration is mounting, researchers studying the effect of the woman's intention to return to work on breastfeeding duration have reported mixed results. Gielan, Faden, O'Campo, Brown and Hendricks (1991) controlled for demographic factors when investigating the effect of both return to work intentions and the reality of a return to paid employment. Actual return to work was significantly associated with early weaning after adjustment for demographics; however no association was found between the intention to return to work and the rate of breastfeeding. These results are similar to those reported by Kimbro (2006), who found no association between breastfeeding and the intent to return to work, but reported that the timing of breastfeeding cessation was closely and powerfully linked to actual return to work, particularly among women with low incomes. However, one other author did find an association between return to work intentions and breastfeeding duration (Noble, 2001).

2.5.2 Workplace Policies

As evidence of a link between return to paid employment and reduced breastfeeding durations mounted, some researchers turned their attention to investigating the effect of workplace policies and practices on breastfeeding duration among employees. An apparently ideal place to conduct this research arose among staff of the Women, Infants, and Children (WIC) program in the United States. Support for breastfeeding within the program had steadily increased over the past decade, and the researchers hypothesised that employees of the program would

breastfeed for longer than the National average (Whaley, Meehan, Lange, Slusser, & Jenks, 2002). This hypothesis was supported when 99% of the mostly para-professional workers from six Los Angeles County WIC offices initiated breastfeeding, and 68.6% of these women continued to breastfeed at least until the baby's first birthday. However, even in this apparently protected environment, the availability of a work-site breastpump was one of four factors accounting for 30% of the variance in the duration of breastfeeding.

Breastfeeding conditions at work, maternity leave and the use of a breastpump have been found to influence breastfeeding duration in previous studies (McKinley & Hyde, 2004; Yilmaz, Gurakan, Akgun, & Ozbek, 2002). Additionally, survey results revealed that almost 90% of women believe that employers should do more to support breastfeeding (Kosmala-Anderson, 2006). In response to this, some employers have introduced company-sponsored lactation programs which have been successful in supporting breastfeeding women after their return to work (Ortiz, 2004). In a study of 462 women employed in five corporations with lactation programs, Ortiz found that 78.9% of women who returned to these workplaces after an average of 2.9 months maternity leave attempted to express breastmilk at work, and 98% of these women did so successfully. These women expressed milk in the workplace for a mean period of 6.3 months, stopping when their babies were an average of approximately 9 months old. Again more salaried women chose to use a breastpump than those paid hourly wages, suggesting a higher rate of breastfeeding among higher-income working women.

2.5.3 Partner's Preferences

A more common influence on the breastfeeding practices of women comes from their husband or partner. Partners have been identified as an important source of both tangible (Buckley, 1992; Matich & Sims, 1992) and emotional (Hewat & Ellis, 1986; Isabella & Isabella, 1994; Raj & Plichta, 1998) support to breastfeeding women. Also, women who perceive their partner as preferring breastfeeding to artificial feeding have repeatedly been found to breastfeed for longer than other women (Arora, McJunkin, Wehrer, & Kuhn, 2005; Bevan, Mosley, Lobach, & Solimano, 1984; Binns, 2004; Landers, Hughes, & Graham, 1998; O'Brien & Fallon, 2005; Scott, Aitkin, Binns, & Aroni, 1999; Scott, Landers, Hughes, & Binns, 2001a, 2001b; Swanson & Power, 2005; Whelan & Lupton, 1998).

This effect is further highlighted by research into the influence of the father's breastfeeding knowledge on breastfeeding duration. A clinical trial conducted by Susin et al. (1999) found that the children of fathers with greater breastfeeding knowledge were 1.76 times more likely to be exclusively breastfed at the end of 1 month, and 1.91 times more likely to be receiving maternal milk at the end of the third month, than those whose fathers had less breastfeeding knowledge. Also, antenatal measures of men's prescriptive beliefs about continued breastfeeding at six time points during the first postpartum year were found to predict their partner's actual breastfeeding behaviour over and above her own stated intentions (Rempel & Rempel, 2004). Results such as these highlight the importance of including the woman's partner in breastfeeding interventions and support where appropriate. However, it is not only the partner who may influence the woman's breastfeeding outcomes, but also her own mother.

2.5.4 Woman's Mother Breastfed

Researchers who studied 1059 Australian women from two distinct geographical areas within Australia found that whether the mother's own mother had ever breastfed was one of three factors associated with weaning before discharge from the hospital (Scott, Landers, Hughes, & Binns, 2001a). This study supports other evidence of a link between the mother's breastfeeding history and her daughter's breastfeeding duration (Ekström, Widström, & Nissen, 2003; Entwisle, Doering, & Reilly, 1982; Fitzpatrick, Fitzpatrick, & Darling, 1994). This suggests that the woman's mother can be an important source of influence and support to the breastfeeding woman.

2.5.5 Other Support

More generally, the woman's overall perceptions of social and breastfeeding support have been studied in relation to breastfeeding duration with mixed results. Some researchers have discovered correlations between overall perception of breastfeeding support and the duration of breastfeeding (Buckner & Matsubara, 1993; Ekström, Widström, & Nissen, 2003; Raj & Plichta, 1998; Tzuriel & Weller, 1986). The amount of perceived social support has also been identified as an important predictor of postnatal depression (Logsdon & Usui, 2001). A recent Cochrane review also concluded that lay and professional support together extended the duration of breastfeeding, though further trials are needed (Britton, McCormick,

Renfrew, Wade, & King, 2007). However, some studies have found no association between perceived breastfeeding support and breastfeeding duration (Boettcher, Chezem, Roepke, & Whitaker, 1999; McNatt & Freston, 1992). In fact, mothers participating in research in Western Australia reported that in general they received lots of advice but little positive feedback about breastfeeding from their social networks (Hauck & Irurita, 2003). The mixed nature of these results suggests that more needs to be done to investigate the effect of social and breastfeeding support on breastfeeding outcomes.

2.5.6 Other Social Issues

Another area warranting further research is the effect of community attitudes toward breastfeeding on breastfeeding duration. Some authors have suggested that women from countries where breastfeeding rates are high are at an advantage over women from countries where breastfeeding rates are low (Hunt, 2006; Zareai, O'Brien, & Fallon). In countries where breastfeeding is the norm for infant feeding, women could be expected to have greater access to breastfeeding knowledge and peer support, more structural support for breastfeeding, and perhaps a healthier expectation of breastfeeding as the "normal" way to feed their infant (Hunt; Zareai, O'Brien, & Fallon). The important role of members of the woman's lay network in normalising breastfeeding is exemplified by the following quote by a research participant in the United Kingdom.

> *I'm worried if I don't breast feed. I would like to breast feed but my mum, my mother-in-law and my sister haven't done it so I'm not sure about it ... but I wouldn't really like to breast feed. I would much prefer the baby get the milk from a bottle. It's more natural that way.* (Murphy, 1999, p. 195)

An appropriate appreciation for motherhood and support for breastfeeding in society have been found to influence breastfeeding duration by other researchers (Tarkka, Paunonen, & Laippala, 1999). These findings are important in the Australian setting, given the low level of support for breastfeeding discovered in South Australia (McIntyre, Hiller, & Turnbull, 1999, 2001). This random telephone survey of 3,400 adults revealed little community support for breastfeeding compared to bottle feeding (McIntyre, Hiller, & Turnbull, 2001). Participants identified several perceived barriers to breastfeeding including the convenience of bottle feeding, maternal discomfort with breastfeeding, the support required for breastfeeding,

fathers' involvement with feeding, and breastfeeding in public. These findings are similar to those found in an earlier focus group study by the same authors (McIntyre, Hiller, & Turnbull, 1999).

Women have reported feeling embarrassed to breastfeed in public or in front of friends and family members in countries as diverse as England (Hoddinott & Pill, 1999), Jordan (Khassawneh, Khader, Amarin, & Alkafajei, 2006), Canada (Sullivan, 1996), New Zealand (Heath, Tuttle, Simons, Cleghorn, & Parnell, 2002) and Australia (Scott, Binns, & Arnold, 1997). For some breastfeeding women, societal embarrassment due to breastfeeding may lead to feelings of social exclusion, isolation and the inability to carry out basic everyday activities (Stewart-Knox, Gardiner, & Wright, 2003). One Australian study measured participants level of comfort with breastfeeding in public situations, and found that the successful breastfeeders (those still breastfeeding at 24 weeks) were more comfortable breastfeeding in public than those who had stopped breastfeeding before 6 weeks (Scott, Binns, & Arnold).

In-depth interviews with 33 Western Australian women suggest that there are several factors which influence the mother's decision regarding whether or not to breastfeed in public. These factors include the mother's confidence with breastfeeding, body image, previous experiences, the age of the baby, the audience, breastfeeding location, perceptions of societal expectations and the feelings of the partner (Hauck, 2004). The latter factor may be of particular importance given research that suggests that fathers are more likely to disapprove of breastfeeding in public than mothers, regardless of the mother's current feeding method (McIntyre, Hiller, & Turnbull, 1999; Shaker, Scott, & Reid, 2004; Shepherd, Power, & Carter, 2000). Together, these results suggest that socio-cultural forces may have an important influence on breastfeeding duration.

Table 2.5

Summary of Socio-Cultural, Economic and Environmental Factors Influencing Breastfeeding Duration

Factor	Description and association
Return to work	The intention to return to work is not always significantly associated with early weaning, but actual return to work often is. Reasonably consistent findings.
Workplace policies	The provision of workplace support for breastfeeding can increase breastfeeding duration among working women. More studies are needed.
Partner's preferences	The infant feeding preferences of the woman's partner are consistently found to influence the duration of breastfeeding.
Woman's mother breastfed	If a mother has breastfed, there is a higher chance of her daughter also breastfeeding. Reasonably consistent findings.
Other support	Some evidence of a correlation between overall feelings of social support and breastfeeding duration. Findings are mixed.
Other social issues	There appears to be little cultural support for breastfeeding in Australia and in other countries, and mothers frequently report feeling uncomfortable and embarrassed about breastfeeding in public. Some evidence that these factors may influence breastfeeding duration.

2.6. Psychological Factors

Finally, individual psychological differences between women are thought to influence breastfeeding duration, though many have attracted little or no research attention. This area holds promise in terms of identifying individual maternal characteristics which may be open to modification aimed at increasing breastfeeding duration. However, more research is needed to define and quantify these factors, and to investigate their possible influence on breastfeeding success. For this reason, the

psychological factors influencing breastfeeding duration are the primary focus of this dissertation.

2.6.1 Time of Infant Feeding Decision

First among the psychological factors to be discussed is the time at which the mother makes her infant feeding decision. Women who decide that they will breastfeed their baby before becoming pregnant have been consistently found to breastfeed for longer durations than those who wait to make this decision until late in the pregnancy or after the birth (Boulton & Landers, 1999; Landers, Hughes, & Graham, 1998; Scott, Landers, Hughes, & Binns, 2001a, 2001b). One recent study showed that when compared to a decision before pregnancy, waiting until after conception to decide how to feed her infant increased the mothers' chance of early breastfeeding cessation threefold (O'Brien & Fallon, 2004).

2.6.2 Prenatal Intentions

Once the decision to breastfeed is made, the woman's intentions regarding the duration of breastfeeding become an important predictor of her actual breastfeeding duration. Antenatal feeding intentions have consistently been correlated with breastfeeding duration, revealing that women who plan to breastfeed for shorter durations are likely to do so (Blyth et al., 2004; Boulton & Landers, 1999; Coreil & Murphy, 1998; Donath, Amir, & ALSPAC Study Team, 2004; Forster, McLachlan, & Lumley, 2006; Jordan, 2005; Kronborg & Vaeth, 2004; Landers, Hughes, & Graham, 1998; Loughlin, Clapp-Channing, Gehlbach, Pollard, & McCutchen, 1985; Piper & Parks, 1996; Scott, Aitkin, Binns, & Aroni, 1999; Scott, Landers, Hughes, & Binns, 2001a; Vogel, Hutchison, & Mitchell, 1999; Whaley, Meehan, Lange, Slusser, & Jenks, 2002). In addition to the intended duration of breastfeeding, intentions regarding the timing of the introduction of supplements have also been found to be predictive of breastfeeding duration. Compared with women planning to Exclusively breastfeed, women in one study who planned to combination feed planned shorter breastfeeding durations, reported shorter actual durations, and were less likely to meet their breastfeeding goals (Chezem, Friesen, & Boettcher, 2003).

However, research shows that prenatal breastfeeding intentions do not always predict actual breastfeeding duration. Chan (2000) recruited women into breastfeeding research based on their intention to breastfeed Exclusively for a

minimum of 3 months, and found that less than half were breastfeeding at all at 3 months, and only around one third Fully breastfeeding (comprised of Exclusive and Predominant breastfeeding). Similarly, Bailey and Sherriff (1993) found that of the women in their Australian sample that came from lower socio-economic groups (n = 45), about half planned to breastfeed for longer than 6 months and only about 17% planned to breastfeed for 3 months or less. However, over half the sample had stopped breastfeeding by the time the baby was 4 weeks of age. Results such as these are in line with those reported by Goksen (2002) who found that intention by itself was not a strong determinant of breastfeeding unless it was accompanied by enabling factors such as social support and supportive subjective norms regarding breastfeeding.

Nevertheless, the evidence linking intentions with breastfeeding duration is strong, leading some researchers to study the factors contributing to these intentions. Kloeblen-Tarver, Thompson and Miner (2002) found that attitudes were more predictive of breastfeeding intention than were norms, regardless of parity or prior behaviour. Paine and Dorea (2001) studied the relationship between infant feeding intentions and gender role attitudes and found that both the least and most traditional women intended to breastfeed for longer than women with moderately traditional gender role attitudes. Women in Paine and Dorea's study who did not work outside the home intended to breastfeed for significantly longer than those who were employed. The mother's attitude toward breastfeeding was also significantly related to infant feeding intentions in this study, as were help with household tasks, and the attitudes of friends and relatives toward breastfeeding.

2.6.3 Attitude to Breastfeeding

In addition to the effect of infant feeding attitudes on breastfeeding intentions, a large body of research suggests a more direct link between the mother's attitude toward breastfeeding and breastfeeding duration. This research shows that mothers with more positive attitudes toward breastfeeding are likely to breastfeed for longer than mothers with less positive attitudes (Cernadas, Noceda, Barrera, Martinez, & Garsd, 2003; Galler, 2006; Kloeblen-Tarver, Thompson, & Miner, 2002; Newton & Newton, 1967; Scott, 2006; Sheehan, 2006; Whelan & Lupton, 1998). Research also suggests that infant feeding attitudes tend to be shared by both the mother and father of the baby (Scott, Shaker, & Reid, 2004), though

breastfeeding mothers may be more supportive of breastfeeding than their partner (Shepherd, Power, & Carter, 2000).

2.6.4 Breastfeeding Expectations

Another psychological factor thought to influence breastfeeding duration is the woman's expectations of breastfeeding. Many women feel the reality of breastfeeding is different to their expectations (Britton, 1998; Friedman, 1996; Welsh, 2004; Whelan & Lupton, 1998). Mothers are often not prepared to experience problems with breastfeeding (Binns & Scott, 2002), and later describe a clash or incongruity between their highly idealised expectations and early breastfeeding problems (Mozingo, Davis, Droppleman, & Merideth, 2000). For some mothers, this may lead to incremental disillusionment and the early cessation of breastfeeding (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005; Mozingo, Davis, Droppleman, & Merideth, 2000).

However, it is not only the experience of problems which may be unexpected, but the embodied experience of breastfeeding itself. Interviews conducted with primiparous Australian women revealed that none of the 25 participants had been able to imagine or prepare for the embodied experience of breastfeeding (Schmied & Barclay, 1999). For some women in this study breastfeeding was pleasurable, sensual and intimate while for others it was difficult, unpleasant and disruptive.

2.6.5 Achievement Motivation

Despite the experience of incongruent expectations, most women participating in Schmied and Barclay's study (1999) were prepared to "persevere" with breastfeeding to achieve their identity as a breastfeeding mother. These women spoke of wanting to "achieve", to "master" breastfeeding and to get breastfeeding "under control". While little research has been conducted in this area to date, measures of motivation (Seacat, 2000) and of achievement motivation (Rentschler, 1991) have been positively related to breastfeeding success.

2.6.6 Depression

A psychological factor that has attracted more research is that of postnatal depression (PND). PND is defined by the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) as a major unipolar depressive disorder which first appears in the first 4-6 weeks after giving birth and lasts for at least 2 weeks in a row

(American Psychiatric Association, 1994). PND is considered distinct from the more common "day three blues" and is also distinct from puerperal psychosis, a more serious illness involving psychotic episodes which affects approximately 0.1% - 0.2% of newly delivered mothers (Williamson & McCutcheon, 2004). Figures vary, but the research suggests that PND affects roughly 10% to 15% of mothers (Horowitz, 2005; NHMRC, 2000; Pope, Henderson, Watts, McDonald, & Evans, 2000), though this may be a low estimate (Miller, Pallant, & Negri, 2006; Williamson & McCutcheon, 2004).

Studies suggest that there is no single cause for PND but several risk factors. Risk factors named to date include infant sleep patterns and maternal fatigue (Dennis & Ross, 2005), low scores on optimism (Carver & Gaines, 1987), reported infant temperament difficulty, and low levels of social support or parenting self-efficacy (Cutrona & Troutman, 1986). Other risk factors include a previous history of depression, unemployment, premature delivery (Jardri, 2006), closeness to partner, self-esteem (Logsdon & Usui, 2001), formula feeding, cigarette smoking (McCoy, 2006), and locus of control (Laizner & Jeans, 1990).

The narratives of mothers with depressive symptoms describe feelings of "struggling with life" related to the self, the child and the partner (Edhborg, 2005). Women with PND also frequently express more difficulties with infant care and greater feelings of bother associated with their infants than the non-depressed (Whiffen & Gotlib, 1989). They often feel like "bad mothers," and tend to blame themselves for this rather than the child (Edhborg; Mauthner, 1999; Whiffen & Gotlib, 1989). Mothers with PND score poorly on measures of maternal role attainment (Fowles, 1998), and exhibit reduced attachment behaviours and representations (Feldman, Weller, Lockman, Kuint, & Eidelman, 1999). Accordingly, the research also suggests that postpartum depression may have long-lasting effects on the child, including adverse outcomes for attachment, cognitive development and emotional development, and increased antisocial behaviours (Logsdon, Wisner, & Pinto-Foltz, 2006; Whiffen & Gotlib, 1989).

Mothers with depressive symptoms are frequently found to have reduced odds of continuing breastfeeding (Dunn, Davies, McCleary, Edwards, & Gaboury, 2006; Forster, McLachlan, & Lumley, 2006; Hatton et al., 2005; Henderson, Evans, Straton, Priest, & Hagan, 2003; McLearn, 2006; Papinczak & Turner, 2000; Tammentie, Tarkka, Åstedt-Kurki, & Paavilainen, 2002; Taveras et al., 2003).

However, the majority of research has been conducted using the Edinburgh Postnatal Depression Scale (Cox & Sagovsky, 1987), an instrument which has been found to correlate strongly with measures of anxiety, in addition to measures of depression (Stuart, Couser, Schilder, O'Hara, & Gorman, 1998). Depression and anxiety share a substantial component of affective distress, but may be differentiated on the basis of factors specific to each syndrome (Clark & Watson, 1991), and may warrant subtly different treatment options (Johnson, 2004; Sadock & Sadock, 2003). Recently, researchers administered both the EPDS and the brief version of the Depression Anxiety and Stress Scales (DASS-21) to a postnatal sample of 325 primiparous Australian women (Lovibond & Lovibond, 1995; Miller, Pallant, & Negri, 2006). After discovering indications of problematic levels of both anxiety and stress in their sample in addition to or distinct from depression, these authors concluded that the DASS-21 provided a broader indicator of postnatal psychological morbidity (Miller, Pallant, & Negri). These findings are in line with those of other researchers who reported that anxiety related symptoms were more severe and common among women admitted to a Melbourne mother-baby unit than were depressive symptoms (Fisher, Feekery, & Rowe-Murray, 2002).

2.6.7 Anxiety

This and other evidence suggests that problematic anxiety is common in women both ante- and postnatally (Brockington, 2004; Heron et al., 2004; Ross, Gilbert-Evans, Sellers, & Romach, 2003; Wenzel, Haugen, Jackson, & Robinson, 2003). In fact, Australian research showed that approximately 13% of postnatal women had symptoms of problematic anxiety, either on its own or in combination with depression (Miller, Pallant, & Negri, 2006). However, more research is needed. The particular constellation of symptoms of anxiety tends to vary between sufferers, but the experience of anxiety is thought to have two main components. These include an awareness of physiological symptoms such as palpitations and sweating, and the awareness of being nervous or frightened (Sadock & Sadock, 2003). Of potential importance to the current research is that anxiety also affects thinking, perception and learning. Sadock and Sadock explain how anxiety-provoked confusion and distortions in perception can interfere with learning by lowering concentration, reducing recall, and impairing the ability to make associations. These authors go on to describe how anxious persons are also apt to select certain things in their

environment and overlook others in an effort to justify their perception of the situation as frightening. In the early days of mothering when the woman must quickly learn all aspects of baby care including breastfeeding and the accurate interpretation of her baby's cues, it is easy to see how anxiety-impaired learning and a tendency to focus on perceived threats may place breastfeeding in jeopardy. This contention is supported by the research, which suggests that a high level of anxiety is associated with shorter breastfeeding durations (Abul-Fadl, Fahmy, Kolhaliah, & Narouz, 2001; Clifford, Campbell, Speechley, & Gorodzinsky, 2006; Forster, McLachlan, & Lumley, 2006; Papinczak & Turner, 2000).

2.6.8 Stress

Stress is a negative emotional state that is distinct from anxiety and depression, and involves chronic arousal and impaired function (Lovibond & Lovibond, 1995). Approximately 5% of postnatal women were identified by the DASS-21 as experiencing problematic stress in one recent Australian study (Miller, Pallant, & Negri, 2006). Also, mothers participating in retrospective qualitative research reported that relief from this stress, perceived as being felt both by the mother and her baby, was a common reason behind the decision to wean (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005).

Research suggests that stress may place breastfeeding at risk through its negative effect on suckling-induced pulsatile oxytocin release. Ueda, Yokoyama, Tirahara and Aono (1994) concluded that the reduction in oxytocin release associated with the experience of stress meant that psychological relaxation is necessary for an adequate let-down response. Hajian-Tailaki (2005) also linked stress to weaning, when he reported that the risk of a shorter breastfeeding duration increased significantly among women with a high level of stress. However, stress was measured in this study on a unique ordinal scale, the validity and reliability of which is unreported.

The relationship between stress and weaning is further complicated by the physiology of lactating women. In fact while there are many stresses placed on the postpartum woman, nature has apparently designed a way to decrease the magnitude of their physiologic response to stress if they breastfeed (Groer, Davis, & Hemphill, 2002). Altemus, Duester, Galliven, Carter and Gold (1995) found that stress-responsive neurohormonal systems are restrained in lactating women. This reduced

neurohormonal stress response may conserve energy, enhance the mother's immune function, protect against stress-associated inhibition of lactation and relieve psychological stress. Other researchers have confirmed the finding that breastfeeding women report lower perceived stress levels (Mezzacappa, 2004), even when compared with bottle feeding women experiencing a similar number of stressful life events, or with controls (Groer, 2005). Therefore, while stress appears to have a negative effect on lactation, is also appears that lactation is protective against the experience of stress.

2.6.9 Flexibility / Adaptability

Breastfeeding is unpredictable. Occurrences like growth spurts, supply fluctuations, sore nipples, engorgement and sleeping through the night mean that nothing ever stays the same. Also, women breastfeeding on demand never know exactly when the child will need to feed and must therefore accept change as the norm (Bottorff, 1990). Regardless of feeding method this happens at a time when, as a woman becoming a mother, many women are also undergoing "a profound reconstruction of self" (Barclay, Everitt, Rogan, Schmied, & Wyllie, 1997, p. 727). Though numbers were small, one study found that the mother's ability to adapt to life with a new baby was itself influenced by a combination of factors including pre-existing emotional reactions, perceived locus of control, health status, and/or stress (Laizner & Jeans, 1990). However, research into the effect of the mother's adaptability on breastfeeding duration is scant.

The extant literature includes two qualitative and one quantitative study that identify flexibility in caregiving or daily routine as being associated with longer breastfeeding durations (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005; Hewat & Ellis, 1986; Vandiver, 1997). Other research conducted by McNatt and Freston (1992) provided further insight into this association when they reported that women who considered themselves unsuccessful with breastfeeding commonly believed that they needed predictability in the feeding situation in order to breastfeed. It is possible that this lack of flexibility places the changeable breastfeeding relationship at risk. Similarly, the value the woman places on her personal freedoms may also impact on breastfeeding duration.

2.6.10 Freedom

Research suggests that loss of freedom and independence, self, time, previous lifestyle, rewarding social roles and control over one's own life are among experiences common to the majority of mothers, regardless of feeding method (Barclay, Everitt, Rogan, Schmied, & Wyllie, 1997). However, a Canadian National Survey (Sullivan, 1996) revealed that breastfeeding was seen as much more restrictive than artificially feeding, largely because participants believed that there are no breaks from looking after the baby. Many women believe that breastfeeding restricts their independence and freedom of movement (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005; Libbus & Kolostov, 1994; Stewart-Knox, Gardiner, & Wright, 2003; Zimmerman & Guttman, 2001) and this loss of freedom is often cited as a reason to cease breastfeeding prematurely (Bulk-Bunschoten, van Bodegom, Reerink, Pasker-de Jong, & De Groot, 2001; Kieffer, Novotny, Welch, Mor, & Thiele, 1997; Kirkland & Fein, 2003). Also, some women who have tried breastfeeding and subsequently switched to formula feeding have expressed a strong desire to re-establish their identities as separate individuals and as "non-mothers" among their reasons for weaning (Earle, 2002). Hall (2001) suggests that many women comply with social mothering role expectations but experience ambivalent feelings which they may have difficulty acknowledging. Breastfeeding is often associated with being a "good" mother (Bottorff, 1990; Fowles, 1998; Hauck & Irurita, 2002; Murphy, 1999; Schmied & Barclay, 1999), and many women may be unsure if they are even "allowed" to grieve for lost flexibility of movement, freedom, individual body integrity and professional identity (Hall, 2001). However this area of research is in its infancy and no evidence of an attempt to measure or more fully describe related individual characteristics which may influence the duration of breastfeeding could be found.

2.6.11 Self-Esteem

Another factor warranting further research is the effect of the woman's self-esteem on breastfeeding duration. There is some evidence that self-esteem is positively correlated with breastfeeding duration (Damato, 2005; Papinczak & Turner, 2000; Whelan & Lupton, 1998), but again more studies are needed. However, research in this area will need to take into account the improved sense of self-esteem and successful mothering seen among women who breastfeed for longer

durations (Labbok, 1999, 2001), which may present a possible confound to many study designs.

2.6.12 Mothering Self-Efficacy

Again, little is known about the effect of maternal self-efficacy on breastfeeding duration. However, research has shown that women whose mothering self-efficacy is low are more likely to perceive their milk supply as insufficient (McCarter-Spaulding & Kearney, 2001), which is often the most common reason provided for early weaning (Binns & Scott, 2002; Chan, Nelson, Leung, & Li, 2000; Kirkland & Fein, 2003; O'Brien, Fallon, Brodribb, & Hegney, 2007).

2.6.13 Breastfeeding Self-Efficacy

Self-efficacy which is specific to the breastfeeding situation has been more widely researched, and represents a characteristic which may potentially be modified to increase breastfeeding duration (Noel-Weiss, 2006b). Research in this area began with attempts to measure breastfeeding confidence, and numerous authors have reported significant relationships between breastfeeding duration and the mother's confidence in her ability to breastfeed successfully (Buxton et al., 1991; Chezem, Friesen, & Boettcher, 2003; Ertem, Votto, & Leventhal, 2001; O'Campo, Faden, Gielen, & Wang, 1992; Papinczak & Turner, 2000). However, the operational definition and measurement of maternal confidence in this body of research is of concern, with inspection revealing inevitable differences in this regard. While some authors focused on the mother's perception of insufficient or nutritionally inadequate breastmilk and developed scales to measure this construct (Hill & Humenick, 1996; McCarter-Spaulding & Kearney, 2001), others focused more broadly on maternal self-confidence. Scales used were often unique and untested (e.g., Papinczak & Turner, 2000), but commonly measure the participant's confidence in up to ten different situations (Buxton et al., 1991; Chezem, Friesen, & Boettcher; O'Campo, Faden, Gielen, & Wang) using a Likert type scale.

In 1999, Dennis used self-efficacy theory as a theoretical framework from which to study breastfeeding confidence, and the same year developed the Breastfeeding Self Efficacy Scale (BSES) to measure this construct (Dennis & Faux, 1999). The scale has since been widely used, and has been successfully translated into both Chinese (Dai, 2003) and Spanish (Molina Torres, 2003), demonstrating the cross-cultural relevance of the construct of breastfeeding self-efficacy and its

influence on breastfeeding duration. Research both in Australia and overseas has consistently shown that breastfeeding self-efficacy is an important predictor of breastfeeding duration (Blyth et al., 2002; Blyth et al., 2004; Creedy et al., 2003; Dennis, 2003; Dennis & Faux, 1999; Ertem, Votto, & Leventhal, 2001; Hauck, Hall, & Jones, 2007). Research conducted in the same geographical area as the current study used the more recently validated Short Form of the BSES (Dennis, 2003), known as the BSES-SF, to demonstrate that breastfeeding self-efficacy made a unique addition to the prediction of breastfeeding duration after adjusting for the influence of 12 socio-demographic variables known to affect breastfeeding duration (O'Brien & Fallon, 2005). The results of this study revealed a 6% decrease in the probability of early breastfeeding cessation for every one-point increase in BSES-SF score (score range = 14 to 70).

2.6.14 Faith in Nature

Possibly related to confidence in the ability to breastfeed, is the mother's faith in her body's natural ability to provide nourishment for her child, and in the natural superiority of breastfeeding. Wolf (2000) contends that historical events such as the emergence of the germ theory of disease, the previously common incidence of dirty or adulterated cow's milk delivered to urban areas, and the influence of the medical profession, led many women to rely on "scientific" food rather than their own bodies. Under these influences, "*the notion that human lactation is an unreliable body function became a cultural truth that has persisted unabated to the present day"* (Wolf, p. 93).

Bottorff's (1990) phenomenological investigation revealed the need for the mother to trust in the natural processes of her body to respond to the infant's need and produce milk of sufficient quality and quantity to nourish the infant. This requires both faith and courage as the baby's survival is at stake. While no author has reported an attempt to further qualify or quantify this characteristic in postnatal women, there is some evidence that women who breastfeed for longer durations report an implicit belief in nature to provide the appropriate nutrients for infant survival (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005).

2.6.15 Optimism

> Carver and Gaines (1987) contend that:
>
> *In any context where the tendency to disengage or give up has adverse consequences, pessimism may represent a risk factor for those consequences, whereas optimism should protect against them* (Carver & Gaines, 1987, p. 451).

Breastfeeding is clearly just such a situation. In addition, dispositional optimism has previously been correlated with many of the psychological factors thought to influence breastfeeding duration including self-efficacy, expectations, self-esteem, perceived social support, persistence, stress and depression (Scheier & Carver, 1992). It is perhaps surprising then that very little research has been done to explore the possible link between breastfeeding duration and maternal optimism.

Optimism has been shown to reduce the chance of delivering a low-birth weight or pre-term infant following a medically high risk pregnancy (Lobel, Yali, Zhu, DeVincent, & Meyer, 2002). Also, Carver and Gaines (1987) studied the link between postpartum depression and dispositional optimism and found that optimism was negatively correlated with postnatal dysphoria, after adjusting for initial dysphoria. Their results suggest that optimism may offer some resistance to the development of postnatal depressive symptoms. Research has also shown that women who choose to initiate breastfeeding are more optimistic than those who choose to artificially feed (Wagner et al., 2006). However, research specific to optimism and breastfeeding duration appears to be restricted to a single qualitative study which suggests that women who continue to breastfeed despite extraordinary difficulties are more optimistic than those who decide to wean under similar circumstances (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005).

Table 2.6

Summary of Psychological Factors Influencing Breastfeeding Duration

Factor	Description and association
Timing of feeding decision	Women who decide to breastfeed before their pregnancy are likely to breastfeed for longer than those who decide late in pregnancy or after the birth. Consistent finding.
Prenatal intentions	Women are likely to enact their prenatal intentions regarding breastfeeding. However, intentions may not be a strong determinant unless accompanied by enabling factors.
Attitude to breastfeeding	Women who have a more positive attitude to breastfeeding tend to breastfeed for longer durations than those who do not. Consistent finding.
Breastfeeding expectations	Women often hold idealised and unrealistic expectations of breastfeeding, which can lead to disillusionment and early weaning. More research is needed.
Achievement motivation	Levels of achievement motivation may be positively related to breastfeeding duration. More research is needed.
Depression	Women suffering from postnatal depression are consistently found to breastfeed for shorter durations than non-depressed women. However, measured postnatal depression may include components of anxiety, or co-morbid anxiety and depression.
Anxiety	High levels of anxiety are associated with shorter breastfeeding durations.
Stress	Stress may place breastfeeding at risk due to its effect on oxytocin release; however the beneficial physiological effects of lactation may protect breastfeeding women from suffering from damaging stress.

Table 2.6 (cont.)

Summary of Psychological Factors Influencing Breastfeeding Duration

Factor	Description and association
Flexibility/Adaptability	There are some indications that a lack of flexibility or adaptability in the woman may place breastfeeding at risk. More research is needed before conclusions can be drawn.
Freedom	A common perception that breastfeeding imposes restrictions on the woman's personal freedom has been widely reported, but little research into related individual characteristics which may mediate any effect of this on breastfeeding duration has been conducted.
Self-esteem	There is some evidence that self-esteem is positively correlated with breastfeeding duration, but more research is needed.
Mothering self-efficacy	The woman's confidence in her mothering ability is known to predict the perception of insufficient breastmilk, but research in this area is scant.
Breastfeeding self-efficacy	The mother's confidence in her ability to breastfeed has been placed within a self-efficacy framework, and demonstrates consistent positive associations with breastfeeding duration.
Faith in nature	Qualitative studies suggest that women may differ in their faith in the natural process of breastfeeding. No attempts to further define or quantify this factor could be found.
Optimism	Breastfeeding initiation has been linked to a more optimistic disposition; however the link between breastfeeding duration and optimism is thus far unexplored.

2.7. Summary

While it is by no means an exhaustive list, important variables known to influence breastfeeding duration can be found summarized in Tables 2.1 to 2.6. Perhaps the most comprehensively researched of these factors are the mother's socio-demographic characteristics. Research in this area reveals a well established association between breastfeeding duration and the woman's age, education and previous breastfeeding experience. Some evidence also exists for an association between breastfeeding duration and the woman's marital status, socio-economic status and place of residence. Other factors including parity and ethnicity have returned more mixed results. However, despite a large body of evidence of their importance, factors in this category are largely difficult or impossible to modify, and therefore offer few opportunities to increase breastfeeding duration.

Section 2.2 contains the common hospital and birth practices that have been researched for their effect on breastfeeding duration. Several of these factors, including non-operative obstetric interventions, early skin-to-skin contact, rooming-in and formula supplementation in the maternity ward, are consistently associated with breastfeeding duration. Other factors such as caesarean delivery, birth analgesia and length of hospital stay have resulted in mixed or inconsistent findings when studied in relationship to breastfeeding duration. These hospital practices may potentially be modified or reduced to lessen their impact on breastfeeding duration.

The third category of factors influencing breastfeeding duration contains maternal behaviours. Consistent associations have been found between breastfeeding duration and maternal behaviours including cigarette smoking, the frequency of feeding, regular pacifier use and the early introduction of solid foods. It is possible that interventions aimed at educating and supporting breastfeeding women may result in a reduction in these behaviours and longer breastfeeding durations for women at risk of early weaning.

Other maternal characteristics such as the mother's scores on intelligence tests and maternal obesity have been consistently found to influence breastfeeding duration. Additionally, the woman's breastfeeding knowledge and the experience of breastfeeding problems may also be associated with the duration of breastfeeding, though this evidence is less compelling. Most factors in this category may prove

difficult or impossible to modify, with the possible exception of breastfeeding knowledge, which warrants further consistent and controlled research.

Socio-cultural, economic and environmental factors have also been linked to breastfeeding duration. Actual return to work and the infant feeding preferences of the woman's partner are consistently shown to influence her breastfeeding duration, but other results in this area are less conclusive. Planned return to work, the breastfeeding history of the woman's mother, and overall perceptions of social and breastfeeding support, have resulted in mixed findings when tested for their effect on breastfeeding duration.

Finally, several psychological factors have been hypothesised to influence the duration of breastfeeding. Individual differences in the timing of the decision to breastfeed, attitudes to breastfeeding, depression, anxiety and breastfeeding self-efficacy have been consistently found to predict breastfeeding duration, while any effect of prenatal intentions or stress is less clear. However, the majority of psychological factors raised require more research before any relationship to breastfeeding duration can be confirmed. These include the woman's prenatal expectations of breastfeeding, level of achievement motivation, flexibility or adaptability, need for freedom, self-esteem, mothering self-efficacy, faith in the natural processes of breastfeeding, and dispositional optimism. Factors falling into this category appear worthy of more research, as they may prove amenable to modification which may result in a reduction in the risk of early breastfeeding cessation, in many cases accompanied by enhancement of the woman's general mental health.

This chapter presented a review of the literature relevant to the determinants of breastfeeding duration. Breastfeeding is a complex and valuable human behaviour and research to date has provided many valuable insights into its determinants. Factors chosen for discussion here represent the relevant and predominant determinants of breastfeeding duration discussed in the literature, but research in the area is extensive and other influential factors do exist. Nevertheless this chapter contains strong evidence of several social, hospital and individual differences between women which significantly predict the length of time for which she will breastfeed. However, many of these factors are thought to be resistant to modification, and therefore provide few opportunities to empower women to continue to breastfeed for longer than is currently the case. For this reason, the

current study will focus on exploring and identifying individual psychological differences between women that influence breastfeeding duration. The next chapter of this dissertation will discuss the methodology underlying the current research and outline the framework within which the research will be conducted.

I have come to realise that I must not put overmuch confidence in the story teller who lives in my mind.

Sir Arthur Eddington

Chapter Three – Methodology & Study Design

3.0 Introduction

The research journey begins with a question, but before the first step along the road is taken, the baggage packed for the journey dictates the traveller's itinerary, and even their destination. Each researcher brings with them a mixture of class, gender, racial and cultural perspectives. This unique mix translates into a framework or set of ideas (ontology), which shapes a set of questions (epistemology) that he or she then sets out to answer or investigate in specific ways (methodology, analysis; Denzin & Lincoln, 2000). Accordingly, in addition to placing the current research question within our present knowledge of the area, it is appropriate to begin this journey with a description of the framework within which it will be investigated. This chapter will therefore begin by providing an outline of the current research design, and the paradigm of enquiry which underlies it. The concept of triangulation will then be introduced, followed by a discussion of the issues accompanying the combination of qualitative and quantitative techniques in the one mixed-method design. The chapter will then conclude with a brief summary of the study design, and the methodological issues raised.

3.1 Current Research Design

As seen in Chapter 2, our understanding of the psychological factors which influence breastfeeding duration is in its infancy, and no comprehensive study of these influences has yet been undertaken. Present knowledge stems from studies where isolated psychological factors have been identified as influencing breastfeeding duration as a relatively minor part of a broader design (e.g., Kessler, Gielan, Diener-West, & Paige, 1995; Taveras et al., 2003), or where a limited number of these characteristics have been chosen by the researcher for investigation (e.g., Dunn, Davies, McCleary, Edwards, & Gaboury, 2006; Kronborg & Vaeth, 2004). It is clear from past studies such as these that numerous psychological factors within the mother impact on her breastfeeding behaviour. However, what is needed is a comprehensive investigation of these influences which is grounded not only in

theory, but also in the varied experiences of breastfeeding women and the clinicians who care for them. Dootson (1995) contends that the reasons for choosing a research method should originate from the research question. Therefore a mixed-method design incorporating both qualitative and quantitative methods will be utilised in the current study.

This study was designed with two phases. Phase 1 of the project aims to utilise the wisdom of women with various experiences of breastfeeding, including both mothers and breastfeeding clinicians, in order to generate a list of psychological factors thought to influence breastfeeding duration. The Nominal Group Technique (NGT) is an ideal vehicle for achieving this goal, as it allows participants to construct this list both individually and collectively, and results in relatively simple, focussed data in answer to the research question (Delbecq, Van de Ven, & Gustafson, 1975). The use of NGT also allows the investigator to gain a more intimate relationship with participants than is generally possible during quantitative enquiry, adding insights which can strengthen the later analysis and interpretation of overall research results. Finally, the Phase 1 enquiry process encourages the participant to raise any and all possible answers to the research question without fear of censure, maximising the possibility of discovering previously unconsidered psychological factors which influence breastfeeding women.

In order to be of more assistance in increasing the currently poor breastfeeding duration rates experienced in this country, Phase 2 of this project seeks to identify those psychological influences which are important to predicting breastfeeding duration in a majority of women. If this can be achieved, it is hoped that these influences can be modified, or that women at risk of early breastfeeding cessation can be identified for increased assistance. The quantitative method is well suited to this task. While it is acknowledged that no real 'truth' applicable to all women is awaiting discovery, this technique allows the identification of relationships between the participant's individual psychological characteristics and the duration of breastfeeding, which occur more frequently than would be expected by chance. The mixed-method design chosen therefore provides an opportunity to gain an overview of the impact of psychological factors on breastfeeding duration, their relative importance, and their ability to predict which women may struggle to breastfeed to the recommended duration (NHMRC, 2003). However, this blend of qualitative and quantitative methods introduces added complexity with regard to research paradigm.

3.2 Paradigm of Enquiry

In fact, perhaps the most complex issue facing the researcher contemplating the use of methodological triangulation is that of paradigm. A paradigm-based approach is used to organise the numerous historical, philosophical and multidisciplinary complexities of research (Grbich, 1999). These paradigms represent differing world views that signify distinctive views regarding reality, knowledge, mode of enquiry and of what is valuable (Sandelowski, 2000). Researchers within these paradigms are thought to share a set of assumptions, strategies and criteria for rigour which guide their approach to research (Fossey, Harvey, McDermott, & Davidson, 2002). Fossey et al. list three principal research paradigms including the empirico-analytical, interpretive and critical research paradigms. However, numerous interpretive communities are said to exist within these over-arching paradigms which represent differing viewpoints within each school of thought (Denzin & Lincoln, 2000).

Utilising both quantifying and qualifying methods in one study introduces complexity, as these methods belong to traditionally different paradigms and epistemological frameworks (Foss & Ellefsen, 2002). In fact, some scholars believe the "naturalistic" and "rationalistic" paradigms underlying qualitative and quantitative research are too opposed to be mixed (Dootson, 1995). Others believe that it is possible to successfully blend qualitative and quantitative methods, but that one paradigm will usually dominate (Foss & Ellefsen, 2002; Sandelowski, 2000). Foss and Ellefson contend that the two major paradigms of enquiry underlying quantifying and qualifying methods should not be seen as dichotomies, but as different positions on a continuum of knowledge. These authors argue that resolution of the epistemology and triangulation debate lies in a comprehensive new epistemological position, which holds that "*within a complex and differentiated reality we need different and various types of knowledge*" (Foss & Ellefsen, 2002, p. 244). This stance does not reject the importance of theoretical and methodological relevance, and neither is it a mix of two epistemological positions, but a distinct epistemological position in its own right.

Given this wide range of opinions, the question of paradigm seems fraught with perils for the novice researcher. However, as tempting as it may be to ignore the issue, or to adopt Foss and Ellefson's (2002) suggestion of a new paradigm more

suited to the process of triangulation, neither option appears reasonable. While failing to identify the world view underlying the research design would cause confusion and erode the foundations of the design (Foster, 1997), the construction of an alternative paradigm is in its infancy, and therefore not widely accepted by the research community. This work therefore takes the post-positive view that reality can only be approximated, and relies on a mixture of qualitative and quantitative methods to capture as much of that reality as possible (Denzin & Lincoln, 2000). Due to its historical roots, the post-positive view is frequently aligned with the empirico-analytical paradigm (Fossey, Harvey, McDermott, & Davidson, 2002), and places emphasis on the discovery and verification of theories, evaluation criteria such as validity and reliability, and favours qualitative procedures that lend themselves to structured analysis (Denzin & Lincoln, 2000), such as the Nominal Group Technique (Delbecq, Van de Ven, & Gustafson, 1975).

3.3 Triangulation

Within the field of research, triangulation has been defined as *"the combination of research strategies to achieve a multidimensional view of the phenomena of interest"* (Foster, 1997, p.2). Triangulation reflects an attempt to gain a deep understanding of the phenomenon in question, often by considering more than one representation of reality in the research design (Denzin & Lincoln, 2000). Use of the term triangulation suggests a search for some fixed point of "truth" or "reality" which is not in line with the post-positive view. Therefore, Denzin and Lincoln's (2005) use of the multi-faceted crystal as the central imaginary for validity using triangulated methods more closely approximates the use of triangulation in this study. Denzin and Lincoln (p. 963) describe the crystal as combining:

> *… symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach. Crystals grow, change, and are altered, but they are not amorphous. Crystals are prisms that reflect externalities and refract within themselves, creating different colours, patterns, and arrays casting off in different directions. What we see depends on our angle of repose …*

Conceptualised in this manner, the triangulated design allows for several views of "reality", and is well suited to both post-positive research, and to investigation of the complex and multi-faceted psychological environment of breastfeeding women.

Denzin (1989) identified four types of triangulation. The first classification is *data triangulation*, which involves the use of multiple sources of data with a similar focus. These may be collected at different times, in different places, or from different people. *Investigator triangulation* refers to the use of two or more skilled researchers to examine the data, while *theoretical triangulation* is the use of all possible theoretical interpretations as the framework for the study (Begley, 1996). Finally, *methodological triangulation* refers to the use of multiple research methods, either by utilising two or more similar data collection methods in the one study to measure the same variable, or by combining the strategies of two or more research traditions (Begley, 1996). Using Denzin's classifications, methodological triangulation is utilised in the present research design by the inclusion of both qualitative and quantitative methods to study the same phenomenon. Data from these two sources will be utilised in the design, in addition to the results of previously published research in the area. This use of multiple sources of data also meets Denzin's definition of data triangulation.

Foss and Ellefsen (2002) contend that the use of a mixed-method design provides the researcher with an opportunity to confirm the results of each study, thereby increasing confidence in the validity of the research. This is among five advantages to designing a study that combines various research methods in a single investigation listed by Polit and Hungler (1997). These are:

- *Complementarity*. The integration of different research methods may diminish or overcome the inherent weaknesses of a single approach, in that the strengths of one method may balance a weakness of the other.
- *Enhanced theoretical insights*. The alternative world views underlying qualitative and quantitative research reflect and reveal different aspects of reality, all of which are worthy of understanding. The use of both qualitative and quantitative methods allows the use of different research techniques designed to illuminate differing views, thereby increasing understanding.
- *Incrementality*. Qualitative feedback is a valuable 'reality check' at all stages of the investigator's often winding journey toward understanding.
- *Enhanced validity*. Supporting evidence derived from multiple and complementary types of data allows for greater confidence in the validity of the results.

- *Creating new frontiers*. Any lack of congruity between data collected using different methods can be used as a springboard to investigate the reasons for this discrepancy, and may lead to important insights (Polit & Hungler, 1997).

However, the use of methodological triangulation also comes with several cautions. Investigators need to be skilled in all the techniques used, and face heavy workloads to complete triangulated studies successfully, which has inevitable cost and time implications (Dootson, 1995; Shih, 1998). In addition to careful attention to study design, Thurmond (2001) contends that researchers using triangulation must be able to articulate why the strategy is being used, and how it might enhance the study. Accordingly, the use of methodological and data triangulation in the current investigation represents an attempt to gain new insights into the psychological factors influencing breastfeeding duration, by incorporating data from multiple sources. The successful assembly of data arising from both qualitative and quantitative methods of enquiry has the capacity to provide all five of the advantages listed by Polit and Hungler (1997) above, and will add depth and completeness to the study results.

3.4 Combining Qualitative and Quantitative Research

The term qualitative research is said to describe research methodologies aimed at describing and explaining experiences, behaviours, interactions and social contexts (Strauss & Corbin, 1990). Qualitative researchers "*stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry*" (Denzin & Lincoln, 2000, p.8). In contrast, quantitative studies are described as existing within a value-free framework, wherein emphasis is placed on measuring and analysing causal relationships between variables rather than on processes (Denzin & Lincoln, 2000). These definitions suggest little in common between the two approaches, and there are some who believe that the two methods belong to "*traditionally different paradigms with fundamentally different epistemological frameworks*" (Foss & Ellefsen, 2002, p.243). However, other authors suggest that while the researcher's orientation and methodological commitments will influence how they are used, qualitative and quantitative methods are not mutually exclusive, and that the techniques utilised are neither paradigm nor method linked (Sandelowski, 2000).

A mixture of qualitative and quantitative techniques is seen by Sandelowski (2000) as a powerful method of expanding the scope of the study, and improving its analytical power. The two techniques provide complementary data sets which together give a more complete picture than that provided when either method is used alone (Tripp-Reimer, 1985).

While qualitative research is equally valuable as a stand-alone research technique, it is often utilised as an important precursor to quantitative work, perhaps because of its ability to facilitate serendipitous findings and to raise unexpected questions and topics which may not otherwise have been considered (Tripp-Reimer, 1985). The addition of a qualitative phase also allows for a more intimate association with the participants and their environment, which provides a more complete view of the area of interest, and is helpful when interpreting the results of either method. Qualitative research findings can therefore be used to make logical generalisations to the theoretical understanding of the phenomena under investigation (Fossey, Harvey, McDermott, & Davidson, 2002; Morse, 1999). This enhanced theoretical understanding is important to early exploratory work such as this. However, Fossey, Harvey, McDermott and Davidson (2002) point out that qualitative research stresses the importance of understanding findings in the particular contexts and settings of the research. Atypical settings or cases are accepted as being as relevant as typical ones, therefore qualitative research *"makes no claim of the generalisability of findings to a specified larger population in a probabilistic sense"* (Fossey, Harvey, McDermott & Davidson, p. 730). Employing a mixed-method approach therefore increases the possibility that the knowledge gained through the study can both contribute meaningfully to emerging theory, and be generalised beyond the limited research setting and sample in which it is obtained (Bordens & Abbott, 1996; Morse, 1999).

The Phase 2 quantitative study will further explore the factors identified in Phase 1 by measuring these factors in a sample of postnatal women, and investigating the relationship between these factors and the duration of breastfeeding to 6 months postpartum. This quantitative enquiry will provide empirical evidence of the incidence, level and predictive ability of these factors, which may be taken into account in the design of breastfeeding support and interventions.

3.5 Conclusion

In conclusion, this study is rooted in the empirico-analytic paradigm, and takes the post-positive view that reality can only be approximated. The two-phase, triangulated design includes both qualitative and quantitative methods. Phase 1 utilises the Nominal Group Technique to gather the opinions of women with various experiences of breastfeeding. Participants will be asked their opinions about which psychological factors influence breastfeeding duration. These data, together with the published literature, will be utilised to decide which factors should be included in the design of Phase 2. In Phase 2, the chosen psychological factors will be measured in a sample of postnatal women, to ascertain their effect (if any) on the duration of breastfeeding. These varied data sources are valued not only for their capacity to confirm each other, but also for the unique and equally important pieces of the puzzle that they may contribute to the results (Begley, 1996; Polit & Hungler, 1997). In the chapter which follows, the methods used in the conduct of Phase 1 will be discussed.

Life must be understood backwards; but... it must be lived forward.

Soren Kierkegaard

Chapter Four – Phase One Method

4.0 Introduction

This chapter will discuss the methods used in Phase 1 of the current study, which was designed to gather the opinions and perceptions of breastfeeding clinicians, and of women with varied experiences of breastfeeding. To achieve this aim, the method by which potential participants had fed their current baby (under 12 months old) was used to form three groups of mothers representing women who were Fully breastfeeding, Complementary breastfeeding, or Artificially feeding their present baby at 6 months of age. A fourth group included health professionals experienced in providing support and assistance to breastfeeding women. The Nominal Group Technique (Delbecq, Van de Ven, & Gustafson, 1975) was used to conduct structured group meetings, during which participants were asked to generate a list of psychological factors which they believed may have an influence on the length of time for which a woman continues to breastfeed. The resultant data were analysed for each group individually, and then for all four groups combined, and these data were utilised in the design of Phase 2 of the study.

4.1 Participants

In order to allow for the comparison of data arising from women with varied personal experiences with breastfeeding, stratified purposeful sampling was employed during recruitment for this study. Stratified purposeful sampling allows for the inclusion of participants with a preselected combination of variables (Sandelowski, 2000). In this case, participants in the three mothers groups were currently mothering a baby less than 12 months old, and were assigned to groups according to the method by which that baby was fed at 6 months. Group four participants were selected for their status as currently active breastfeeding professionals.

There are no closely defined rules for sample sizes in qualitative research, where the emphasis is on studying in depth and detail (Fossey, Harvey, McDermott, & Davidson, 2002; Mays & Pope, 1995; Tuckett, 2005). However, it is important that each group is sufficiently large to create discussion, but not so large that group

members are prohibited from sharing their insights within the available time (Halcomb, Gholizadeh, DiGiacomo, Phillips, & Davidson, 2007). While some researchers report success with smaller numbers (Cote-Arsenault & Morrison-Beedy, 1999), adequate group size is generally considered to be between four and 12 participants, with the optimal size being between five and ten individuals (Halcomb, Gholizadeh, DiGiacomo, Phillips, & Davidson, 2007). The recommendations of the authors of the Nominal Group Technique were also taken into account in deciding sample size, resulting in a target of five to nine members for each of the four groups (Delbecq, Van de Ven, & Gustafson, 1975).

Several strategies were utilised to recruit women meeting the study criteria into the Phase 1 groups. A total of 21 participants were recruited from various sources including referral through the researcher's professional networks (n = 8), and the Australian Breastfeeding Association (n = 1). One participant was recruited from among women who had earlier indicated their interest in participating in further breastfeeding research during the course of studies conducted by the researcher in the previous 2 years (Hegney et al., 2004; O'Brien & Fallon, 2005). Eleven participants were recruited as a result of a news item in the local media (n = 9) and posters placed at baby change facilities in the local area (n = 2), thereby providing access to a wider cross-section of the general community.

All women recruited into the three mother's groups had babies between 6 and 12 months old, and were assigned group membership based on their infant feeding method with this baby at 6 months postpartum. Using stratified purposeful sampling, three groups of between five and nine members matching the following criteria were sought (for more complete definitions of infant feeding methods see Appendix A):

Fully breastfeeding (FBF): Women who fed their youngest baby breastmilk (includes expressed breastmilk) without regular formula or solids for a minimum of 6 months. The target baby was 12 months old or less at the time of participation.

Complementary breastfeeding (CBF): Women who introduced formula or solids to their youngest baby before 6 months of age, and continued to partially breastfeed (includes expressed breastmilk) for a minimum of 6 months. The target baby was 12 months old or less at the time of participation.

Artificially Feeding (AF): Women who initiated breastfeeding with their youngest baby, but weaned onto exclusive formula (with or without solids) before 6 months. The target baby was 12 months old or less at participation.

The fourth group was comprised of currently practicing breastfeeding professionals who met the following criteria:

Health Professionals (HP): Currently practising Lactation Consultants, midwives and/or other health professionals with extensive experience of working with breastfeeding women.

Due to the infant age criteria and the stratified nature of the sample sought, not all women who expressed an interest in the study were able to participate. Groups were held on the earliest date on which five to nine qualified group members confirmed their availability to attend.

4.1.1 Characteristics of Participating Mothers

All of the mothers participating in the FBF, CBF and AF groups were married and lived in the regional city of Toowoomba in Queensland, Australia. The women making up the FBF group were all multiparous, while three of the seven CBF women, and one of the five AF women were first-time mothers. All multiparous participants had breastfed their previous child/ren. Only one woman participating in either the FBF or CBF group had returned to (casual) paid work, while three of the five AF women had returned to part time paid work when the baby was between 2 and 4 months old.

The target babies were aged between 26 and 52 weeks at the time of the nominal groups. At this time all members of the Fully (n = 5) and Complementary breastfeeding (n = 7) groups were still breastfeeding their baby. No participant in either of these two groups had ever introduced regular formula to their baby. Mothers in the CBF group had all introduced regular solids to their baby before 6 months of age (*range* = 18 – 24 weeks, $\bar{x}$ = 20 weeks). Artificially Feeding group mothers (n = 5) were all feeding their babies formula and solids at the time of the group meeting. Further participant descriptors can be found in Table 4.1.

Table 4.1.

Mean Value and Ranges of Continuous Descriptors for Participating Mothers

	Fully Breastfeeding *mean (range)*	Complementary Breastfeeding *mean (range)*	Artificially Feeding *mean (range)*
Mother's age (years)	34 (29-40)	28 (19-38)	30 (26-32)
Baby's age (weeks)	47 (40-52)	40 (31-49)	35 (26-44)
Solids introduced (weeks)	27 (26-28)*	20 (18-24)	20 (16-24)
Mother's education (years)	15 (13-19)	12 (9-15)	15 (12-18)
Partner's education (years)	17 (10-24)	13 (10-17)	15 (12-17)

Note. FBF $n = 5$; CBF $n = 7$, AF $n = 5$. * One FBF participant had not yet introduced solids; therefore this figure represents the mean of the remaining four participants.

4.1.2 Characteristics of Participating Health Professionals

Due to difficulties recruiting qualified health professionals able to participate in this project, combined with one sudden illness on the group meeting date, the minimum target of five participants was not met for the HP group. As this group is clearly distinct from the remainder by nature however, it was decided to continue with the meeting with the available participants ($n = 4$). All HP group members were qualified lactation consultants, three of whom were also experienced midwives, while the other was a medical practitioner. All were women. These participants brought with them considerable experience in assisting breastfeeding women, with each holding between 15 and 27 years of clinical experience in this area ($X = 20.5$).

It was this wealth of clinical experience and the clinical judgement potentially developed by breastfeeding clinicians which was sought from the inclusion of this group in the study design. Nursing and medicine have a long tradition of applying clinical judgement to basic biological and physiological sciences (Benner, 1999). Benner contends that this clinical judgement can be described by two habits of thought and action, which she terms clinical grasp and clinical forethought. For Benner, clinical grasp includes identifying the problem and the use of clinical judgement across time and through the particular transition of the patient and their family. Clinical grasp includes four components including making qualitative distinctions, engaging in detective work, recognising changing

clinical relevance, and developing clinical knowledge in specific patient populations. Clinical forethought (Benner) includes forethought about specific diagnoses and injuries, seeing the unexpected, anticipation of risks for particular patients, and thinking and acting with regard to anticipated futures. Following this contention, the ability to anticipate the future course of breastfeeding in particular women may develop among clinicians who possess clinical insight. This clinical insight therefore adds further depth to the data gained in this phase of the study.

In order to ascertain the health professional's confidence in her ability to recognise the maternal characteristics which predict breastfeeding success, the preliminary questionnaire (Appendix B) included the following item: "Previously, many breastfeeding clinicians have told us that after working with breastfeeding mothers for some time, they developed a degree of 'clinical insight' which allows them to predict with some accuracy which mothers will breastfeed successfully, and which will struggle. Do you believe you have developed this insight?"

One participant was a hospital midwife who was not involved in postnatal clinical work and only saw mothers during their postnatal hospital stay. She rarely, if ever, had contact with these mothers in later weeks; and therefore did not feel she had gained enough feedback on their subsequent breastfeeding success to enable her to estimate her accuracy when predicting breastfeeding duration after hospital discharge. She declined to answer this question. The remaining three participants indicated that they did believe they had developed this insight. When asked to estimate accuracy on a 5-point Likert scale, all three indicated that they would expect to be accurate in their prediction 75% of the time.

4.2 Materials

Data necessary to describe the participating mothers (FBF, CBF and AF groups) were collected using a 24-item self-report questionnaire containing yes/no, multiple response and Likert scale items designed by the researcher to cover the demographic, psychosocial and breastfeeding information relevant to this description. A copy of this questionnaire is attached as Appendix C. Infant feeding information gathered using this instrument allowed accurate classification of the participant's infant feeding method both at the time of participation and at 6 months postpartum. In line with World Health Organisation recommendations for classifying infant feeding methods (Webb, Marks, Lund-Adams, Rutishauser, & Abraham,

2003), these classifications were defined as follows (a full list of definitions used in this project can be found in Appendix A):

- Fully Breastfeeding (FBF): Includes breastmilk or expressed breastmilk (EBM). No formula or solids.
- Complementary Breastfeeding (CBF): Breastmilk and solids or semisolid foods or non-human milk.
- Artificially Feeding (AF): No breastmilk. Any food or liquid including non-human milk.

Data necessary to describe participants in the HP group were collected using a 4-item self-report questionnaire including yes/no, single word or Likert scale items designed by the researcher to gather information regarding the participants' experience, expertise and confidence as a breastfeeding clinician. A copy of this questionnaire is attached as Appendix B.

Additionally, the following equipment and materials were utilised during the conduct of nominal group meetings:

- A printed copy of the meeting agenda/procedure (Appendix D).
- Workbooks for each group member to use during Step 1, which included the question printed at the top of the page, and space for responses beneath.
- A prepared ratings sheet on which priority items were noted during Step 4 (Appendix E).
- Large butchers paper, pens, masking tape and markers.
- Whiteboard for presentation of results at Step 5.

4.3 Procedure

Ethical approval was given by the University of Southern Queensland Human Research Ethics committee (approval number H04STU392), before commencement of the project. After an initial telephone conversation to describe the research and discuss participation, participants were sent a follow-up letter containing a plain language statement and consent form (see Appendix F), a map of the university grounds marked with the meeting's venue, and a brief questionnaire (see Appendices B and C) that collected the relevant demographic and background information necessary to describe the participants. Once the target of between five and nine group members had agreed to participate, members were telephoned to arrange a mutually convenient time for the nominal group to take place. This contact

was followed by a reminder call a few days before the planned group meeting. Consent forms and questionnaires were collected on arrival at the venue, where members were welcomed as subject matter experts. In order to document the study process in detail, field notes describing each emerging group were kept by the researcher and notes were added to these as needed throughout the study.

Each group was facilitated by the researcher, and factors raised by the group were printed in large letters on butchers' paper by a scribe (using the groups' words). Scribes were experienced researchers who volunteered to assist with the project from among the researcher's professional network. At the commencement of each group, members were given a brief outline of the nominal group process and meeting agenda and a printed agenda was provided for their use (see Appendix D). The study's aims were then reiterated, and one example of a relevant psychological factor provided. Due to its well established influence on breastfeeding duration, breastfeeding self-efficacy was chosen as the example factor presented at this point.

4.3.1 The Nominal Group Technique

The nominal group technique (NGT) was chosen as the method of enquiry for this study for several reasons. The NGT involves a structured group meeting which allows for both individual and group processes in decision making, while overcoming a number of critical problems typical of interacting groups, such as those posed by particularly dominant or retiring group members (Delbecq, Van de Ven, & Gustafson, 1975). The NGT is also thought to create a more egalitarian environment than conventional group processes, allowing each voice to be equally heard (Delbecq, Van de Ven, & Gustafson). Van De Ven and Delbecq (1974) compared the NGT with conventional interacting groups and concluded that the NGT was more effective than interacting groups when applied to problems which are difficult, have no solution that would be equally acceptable to different interest groups, and arouse highly emotional and subjective reactions. Groups utilising the NGT in Van De Ven and Delbecq's investigation generated more ideas than conventional groups, and participants reported higher perceived satisfaction with the group results. The NGT has been used effectively in several published studies to meet aims including the identification of problems experienced by persons living with severe physical disabilities (Elliott & Shewchuk, 2002); identifying conceptualisations of empowerment among public health nurses (Falk-Rafael, 2001);

gathering young people's views on facilitating the participation of young people in sport (MacPhail, Kirk, & Eley, 2003); and reaching a consensus on the adoption or adaptation of World Health Organisation practice recommendations regarding contraceptive use (Glasier, Brechin, Raine, & Penney, 2003). These indications of the efficacy and advantages of the NGT prompted the use of the NGT process in the current study. In accordance with this design, all group meetings proceeded through the following steps:

1. Silent generation of ideas in writing (about 5-10 minutes)

Group members were presented with an open-ended question in written form, which was also read aloud by the group leader. For all groups, the question began as follows: "We believe that there are many personal qualities (including personality attributes and other psychological factors in each mother's make-up), that have an effect on a mother's behaviour with regard to breastfeeding, and therefore how long she will continue to breastfeed for." Each group of mothers was than asked: "Taking into consideration your breastfeeding experience (and that of your friends and relatives), which factors do you believe contribute to a mother's decisions and behaviours with regard to feeding her baby?" For the health professionals, the subsequent question read: "As a person with considerable experience and insight into breastfeeding mothers, what factors such as these do you believe contribute to a mother's decisions and behaviours with regard to feeding her baby?" Members were then asked to spend 5 minutes silently and independently listing their ideas in response to the question in brief phrases on sheets provided by the researcher for this purpose.

2. Recorded round-robin listing of ideas on chart (20-40 minutes)

Each group member was asked to read one of her ideas in turn, while the scribe wrote each idea on a fresh piece of butchers' paper as it was read. All ideas were assigned a number, and recorded as presented without discussion. Numbered factors were taped to the walls in clear view of all participants. The procedure continued around the table enough times for each group member to complete her list. It was also permissible to generate additional factors and/or build on fellow participant's ideas at this step.

3. Discussion of each idea for clarification and evaluation (20-40 minutes)

Each idea raised was then discussed in numerical order. The leader read each aloud in turn, and asked the group for questions, clarification, or any statements of

agreement or disagreement members would like to make. As with Step 2, additional factors raised by the group were also added at this stage. This portion of the discussion was audiotaped for later transcription.

4. **Vote on priorities: silent, independent (5-10 minutes)**

The researcher read the question aloud again, and asked group members to silently and independently select the seven factors from the collective group list which they personally believed were most important in influencing breastfeeding duration. Members were asked to list these on a rating form designed for this purpose (Appendix E), and then to rate the items from no importance (0) to high importance (10). No ordinal ranking was requested, and the participant could assign several items equal importance if desired.

Morning/Afternoon Tea The group leader (or scribe) tallied the item ratings during this break, and presented the group results on a whiteboard in preparation for Step 5.

5. Presentation of group consensus and final discussion

The purpose of this discussion of the group results was for clarification, specifically to examine inconsistent voting patterns, and to provide an opportunity to discuss any items which were perceived as receiving too many or too few votes. This portion of the discussion was also audiotaped for later transcription.

4.3.2 Validity and Reliability

The main ways that qualitative researchers ensure the reliability of their analyses is in maintaining meticulous records (Mays & Pope, 1995). In this study, field notes documenting each step of the process including the researcher's impressions and interactions with participants were carefully completed. Audiotapes and subsequent verbatim transcriptions added to this record during the conduct of the groups. Also, the use of the Nominal Group Technique in this study resulted in more structured data than is often the case with qualitative research. The bulk of the data were in the form of factor lists generated by group participants. The participants' own words were used to label these factors and quotes taken from the verbatim transcription were used as thick desciptions of the factors raised.

Confidence in the validity of this study is enhanced by the use of a triangulated research design which incorporates multiple research and data collection methods (Foss & Ellefsen, 2002). This design provides the opportunity to confirm the results of each phase of the study through comparison with the other.

Additionally, the group process included a confirmatory step (Step 5), during which results for the group were presented to all participants to see if they regarded the findings as a reasonable account of their meaning (Mays & Pope, 1995). At this step participants were invited to discuss the group generated data and clarify or refute any result which they did not believe represented the group view. The validity of the study was also enhanced by the careful consideration and presentation of 'negative' or 'deviant' cases during the thematic analysis (Mays & Pope). At this time an attempt was made to give all such voices a fair account and to try to explain and describe the possible origins of any differences.

4.3.3 Data Analysis

Data arising from the NGT process were considered both for each group and for the four groups combined and included:

- the complete list of factors generated by each group during Steps 1-3;
- the shorter list of factors seen to be of 'top seven' importance by members of each group during Step 4;
- the ratings allocated by individuals at Step 4, including the number of people who saw this factor as of 'top seven' importance, and individual ratings for each factor, allowing for both group and overall ranking of factors;
- the audiotaped group discussions (Steps 3 and 5 only).

Factor lists were generated by the groups, and the original group-generated factor name was retained where possible. Audiotapes of the group discussions during Steps 3 and 5 were transcribed verbatim for analysis. These transcribed data were utilised as a source of rich descriptions of the factors named by the group, and to check for the presence of additional psychological factors contained within the discussions, but not named by the group. This analysis involved the careful reading of verbatim texts, and sought to identify themes or categories arising from the data itself, rather than from theory (Fossey, Harvey, McDermott, & Davidson, 2002). This thematic analysis allowed for the systematic description of psychological characteristics thought by group members to influence breastfeeding duration, but not articulated in group lists. Themes identified during the analysis represent recurring ideas, language and patterns of belief contained within the data (Marshall & Rossman, 1995). This in-depth analysis of the discussion by a psychologist

allowed for the articulation of psychological factors which were implied but not named by group participants, whose more limited understanding and vocabulary for psychological concepts may have made the specification of such additional factors difficult.

The data were analysed first by group, and then data from all four groups was combined and compared across group. Group discussions of similar psychological characteristics across groups were brought together, and factors which were conceptually the same were combined while those that were internally consistency but distinct from other factors were added to the list (Robinson, 1999). This was achieved through close inspection and questioning of the data and involved reflecting on the conceptual framework (Marshall & Rossman, 1995), the meanings assigned by group members during the discussion, relevant psychological theory, and the content of the broader group discussions. The presentation and discussion of the results of Phase 1 are the topic of Chapter 5.

Ideas are like rabbits. You get a couple and learn how to handle them, and pretty soon you have a dozen.

John Steinbeck

Chapter Five: Phase One Results and Discussion

5.1 Introduction

A total of 53 distinct factors influencing breastfeeding duration were identified in the Phase 1 data. Categories emerged from the data including individual psychological characteristics; motivating attitudes; motivating experiences; mothering issues; social expectations; other social and support issues; and strategies for success. Discussion of the factors raised under these categories represents the first seven sections of this chapter, which includes summary tables and the quoted words of study participants, along with a discussion of any previous research related to the factor raised. To preserve the larger picture provided by the complete data, Section 9 of this chapter contains a table listing non-modifiable socio-demographic factors and unclassified items raised by the groups. Overall group comparisons and a summary of the factors voted as most important by participants are then discussed, followed by a brief chapter summary. Finally, factors chosen for inclusion in Phase 2 will be presented.

To improve readability, in this dissertation the quoted voices of study participants will be presented in *Arial italics*, while the voices of others will appear in *Times New Roman italics*. Where required, the speaker's emphasis will be indicated by the use of **bold** print.

5.1.2 A Note on the Tables

Each data category presented begins with a table which lists the factors raised by group participants, and indicates whether the factor was either: raised by the group but not voted among the most important (indicated by an "a"); raised and later voted as among the most important factors influencing breastfeeding duration by this group (indicated by an "A"); or identified as a theme contained within group discussions during subsequent analysis (indicated by an "x"). At the time of group

voting some group lists contained two or more items which were conceptually very similar, and where necessary these factors were later combined to form a single item. As this analysis did not occur until after the voting process, in some instances participants voted two conceptually similar items as among the most important factors, or are noted as raising an item twice. For this reason, the tables which follow may at times indicate that a factor was raised more than once (i.e. “aa”), or that two conceptually similar factors were raised, one or both of which was later voted among the most important (i.e. “Aa” or “AA”). To add further richness to the information contained within these tables, factors which were subsequently chosen for measurement in Phase 2 are marked with an asterisk.

5.2 Individual Psychological Characteristics

The first category to be discussed contains the individual psychological characteristics which represented the primary focus of this study. Eighteen distinct psychological factors were raised by the groups as having an influence on the duration of breastfeeding. These factors are listed in Table 5.1, along with the coded summary of results on this factor for each group. The discussion which follows includes a summary of the group data relevant to the individual psychological factor raised, along with a discussion of any related published research.

Table 5.1.

Factors Related to Individual Psychological Characteristics

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Flexibility / Adaptability*	A	A	A	A
Stress *	A	A	A	a
Breastfeeding self-efficacy*		Aa	A	
Determination and persistence	A	a		A
Optimism*	x	A	x	
Happiness & use of humour	x	x		a
Breastfeeding expectations*	A		a	a
Self-esteem*		a	a	a
Body image	A	a		a
Psychological reactance*		aa	aa	
Intimacy		a		x
Achievement striving*	A			a
Resilience	A			a
Depression*			a	a
Anxiety*			x	aa
Perfectionism				a
Assertiveness				a
Need for control	A			

Note. A = selected among the most important factors; a = raised by the group but not selected as among the most important; x = identified as a theme in the group discussions. *This factor chosen for inclusion in Phase 2.

5.2.1 Flexibility/Adaptability

The transition to motherhood was acknowledged by group members as a time of rapid change. They believed that the woman's ability to be flexible and readily adapt her life to accommodate the demands of a new baby made this transition easier. This factor was raised by all groups, and voted among the most important psychological influences on breastfeeding duration by all but the FBF group.

> AF Participant: *Like how flexible and adaptable you are as a person. How you cope with change.*

HP Participant: *I think adaptability is a **really, really** important thing, because … having a baby is never what you expect it's going to be like…*

Participants talked about the changes they had experienced, and believed that breastfeeding was the cause of some of this change.

FBF Participant: … *breastfeeding changes your day to day life. And I've sort of heard some parents-to-be say ah, "Oh ... we're not going to change anything, the baby's gonna fit in with our life, we're not gonna fit in with it's" … I used to be a bit like that. Now I sort of realise, you need to be flexible.*

This need to adapt to change after the arrival of a new baby was most pronounced after the birth of a first child, but was seen as being equally relevant to multiparous women, as the challenges can be very different with each child.

FBF Participant: *Every one's different … every breastfeeding with every child's different.*

This appears to be the fourth qualitative study to have identified flexibility as an influence on breastfeeding duration. Hewat (1986) found that flexibility in daily routine was associated with women who breastfed for longer durations. Flexibility was also identified as one of the personal characteristics evident in the interview transcripts of women who overcame extraordinary breastfeeding difficulties in one recent Australian study (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005). Also, McNatt and Freston (1992) found that women who did not breastfeed successfully commonly indicated a need for predictability in the feeding situation and a tendency toward rigidity. However, no evidence could be found of an attempt to measure or explore this factor further in the mothering context.

5.2.2 Stress

All four groups raised the experience of stress and the mother's ability to relax or "*chill out*" as a factor influencing breastfeeding duration, and all three groups composed of mothers identified this as among the most important factors. There were slight differences between the groups in their discussion of this factor. Members of the FBF and CBF groups raised strategies they used to combat stress.

FBF Participant: *I was very stressed, I was losing my milk, and I just had to sit back, take a big breath and just completely refocus again*

CBF Participant*: I think you need to have your relax time, otherwise you burn out, you need to have your time out.*

However, AF mothers focussed more on the negative impact of this stress on the woman, and on the various sources of stress, including anxiety, low mothering self-efficacy, the weight of social expectations, and breastfeeding itself.

AF Participant*: I felt that I was expected to be … succeeding at; at the feeding … it probably increased my stress levels.*

AF Participant*: …I wouldn't be in this situation if I didn't have to breastfeed*.

AF Participant: *It's also a different stress though, than what we normally are used to … baby's been screaming for 3 hours. And I don't know what's wrong, and I don't know how to fix it.*

Finally, the HP group raised the impact of stress on the milk supply, and the apparent differences between women's vulnerability to the experience of damaging stress.

HP Participant: …*just the stress of it is enough to knock her milk on the head*

HP Participant: *But you could put two mothers in the same situation and one would perceive it as stressful, and one would not.*

The experience of stress is characterised by persistent tension, irritability, and a low threshold for becoming upset or frustrated (WHO, 2000). Studies suggest that suckling-induced pulsatile oxytocin release may be modulated by the central nervous system, and that psychological relaxation is necessary for an adequate let-down response (Ueda, Yokoyama, Irahara, & Aono, 1994), supporting the participant's belief that stress is a factor in reducing breastfeeding duration.

5.2.3 Breastfeeding Self-efficacy

The woman's confidence in her ability to breastfeed, known as breastfeeding self-efficacy, was the example provided to participants of a psychological factor which has an influence on breastfeeding duration. Breastfeeding self-efficacy was voted among the most important factors influencing breastfeeding duration by the CBF and AF groups. However, group differences emerged again. These are seen in the nagging doubts about breastfeeding expressed by the AF woman quoted shortly, when compared to the relaxed confidence expressed by the CBF participant which follows.

AF Participant: *… what is she getting? And do you put her on both breasts, or do you only let her have one? There's all these sort of, books and stuff about only feeding one side, and then feeding the next. Or do you put her on both for, for the same time? And there's just all this,* ***mind-boggling*** *stuff.*

CBF Participant: *You know it doesn't matter how many mls, he's putting on weight and he's healthy.*

The AF group focussed specifically on the woman's confidence in her milk supply when naming this item, and the discussion among group members revealed their doubts about not only the quantity, but also the quality of their breastmilk.

AF Participant: *I had the problem where I had too much foremilk, so* [baby's name] *was not getting any hindmilk, so that was always playing on my mind. Yeah, she's not getting the good milk, she's not going to put on weight.*

Another AF participant yearned for proof that her baby was getting enough milk, raising the issue of test-weighing.

AF Participant: *… is she getting enough? It's not as though I, I had a set of scales to put her on every time I fed her.*

However, while this mother perceived that test-weighing may increase her confidence, the effect of test-weighing has been studied before and no significant differences in breastfeeding confidence or competence were found between the test-weighing and control groups (Hall, Shearer, Mogan, & Berkowitz, 2002).

Breastfeeding confidence has been identified as an important predictor of breastfeeding duration in numerous previous studies (Buxton et al., 1991; Dunn, Davies, McCleary, Edwards, & Gaboury, 2006; Ertem, Votto, & Leventhal, 2001; Loughlin, Clapp-Channing, Gehlbach, Pollard, & McCutchen, 1985; Papinczak & Turner, 2000; Taveras et al., 2003), and was placed in the theoretical framework of self-efficacy in 1999 (Dennis, 1999). This strengthened the research in this area by providing clear operational definitions and allowing for the construction of a valid and reliable tool for its measurement (Dennis, 2003; Dennis & Faux, 1999). After adjusting for the influence of 12 major socio-demographic factors effecting breastfeeding duration, breastfeeding self-efficacy remained uniquely predictive of breastfeeding duration in one recent Australian study (O'Brien & Fallon, 2005).

5.2.4 Determination and Persistence

Determination and persistence are thought to be related to self-efficacy, in that higher levels of self-efficacy lead to greater persistence in the face of difficulties (Bandura, 1977). Determination and persistence was raised as a factor by all but the AF group, and was voted among the most important factors by the FBF and HP groups. All three groups talked of women being so determined to breastfeed that no alternative was ever entertained, as exemplified by the following quotes.

FBF Participant: *Despite anything.* ***Whatever,*** *you just have to do it.*

HP Participant: *This … mental strength to just plough through things.*

Women have been found to recognise the importance of persistence to breastfeeding continuation in previous studies, and frequently offer this as advice to new mothers (Bottorff, 1990). Determination and persistence was also identified as a factor in data arising from the *Against All Odds* study (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005), which explored the characteristics of women who persisted with breastfeeding in the face of extraordinary difficulties.

5.2.5 Optimism

The concept of optimism was also raised as a factor influencing breastfeeding duration. The tendency to believe that one will generally experience good rather than bad outcomes in life is known as dispositional optimism (Scheier & Carver, 1985). Optimism was voted by the CBF group as among the most important psychological factors influencing breastfeeding duration, and was identified as a theme in the transcripts of both the FBF and AF groups. The participants' tendency toward positive expectancies was seen in quotes such as the examples which follow.

CBF Participant*: … You know that you have good days and another one might be around the corner.*

CBF Participant: *It's just like, that's what I'm going to do, and I'm relaxed about it, like that will happen, and it will be ok.*

Though no studies linking breastfeeding and optimism could be found, Carver and Gaines (1987) found that dispositional optimism was associated with resistance to the development of postpartum depressive symptoms (measured several weeks before childbirth, and then 3 weeks after the birth). Optimism among these mothers was associated with active problem-focused coping and seeking social support, while pessimism was associated with a tendency to give up and disengage

from goals, and with a focus on the negative feelings elicited by stressors. Also, Lobel, Yarli, Zhu, DeVincent and Meyer (2002) found that women with an optimistic disposition experienced less emotional distress during high-risk pregnancies. Optimism among these medically high-risk women was also found to reduce the chance of delivering a low birth weight or pre-term baby. Pessimistic women in the Lobel et al. study were more likely to use avoidant coping, and to evaluate their high-risk pregnancy as uncontrollable, which was associated with higher distress.

5.2.6 Happiness & the Use of Humour

Happiness and the use of humour was raised by the HP group as a factor influencing breastfeeding duration, and identified as a theme in the transcripts of the FBF and CBF groups. The FBF and CBF group data indicated that the participants' use of humour helped them to cope with the perceived challenges of breastfeeding.

> FBF Participant: *My husband and I laughed when um, you, I've had a let down while we're* [laughs] … *goes everywhere … and I think … ooh …. That's romantic isn't it?* [laughs]
>
> CBF Participant: *… I was a 12B before I had* [baby's name] *and I went to a D cup, or a DD - E cup, which was excruciating* [group laughs] *and I went back to a B, and with* [baby's name] *I went back to a D, so … I'll probably be able to roll them up one day.*

The health professionals talked about happiness as being the result of the woman's reaction to the mothering role and the changes inherent in adding a new baby to the household.

> HP Participant: *I think those people who are happy, are just happy with the whole life …*

This use of humour and the maintenance of a positive affect was also seen by some CBF participants as a consciously utilised strategy. These women recognised the effect of their behaviour on those around them, and used their own apparent cheerfulness as a coping strategy.

> CBF Participant: *And I sorta take it upon myself to be the … if I'm happy everyone's happy* … [group agrees] *you know it might **not** be that way, but I think it's a coping mechanism.*

A recent study investigating the influence of personality factors on breastfeeding initiation (Wagner et al., 2006) found that group scores for the breastfeeding women were associated with being affectionate, friendly, active, optimistic, receptive to emotional experience and willing to try new activities, while mean scores for the artificially feeding group were associated with being reserved, less exuberant, less likely to try new activities, less likely to acknowledge feeling states as important, and more sceptical. These findings would appear to tentatively support the possibility of differences between breastfeeding and artificially feeding women with regard to affect and the use of humour, but more research is needed in this area.

5.2.7 Breastfeeding Expectations

The FBF, AF and HP groups raised the woman's breastfeeding expectations as a source of influence on her breastfeeding duration, believing that realistic expectations are an advantage. This AF mother felt she was adequately prepared for breastfeeding, and was surprised at how difficult it was for her.

> AF Participant: *… I felt that I should be able to do it because I **had** read the books, and I'd **been** to the classes, and it was made out that it was something that everyone could do, with a bit of perseverance. That it wasn't something that … many if any people failed at. It probably made it a worse situation than it already was.*

Research suggests that women are often unprepared for the experience of problems with breastfeeding, though most do experience difficulties of some type (Binns & Scott, 2002; Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005; Hoddinott & Pill, 1999). In a phenomenological investigation of women's experiences with short term breastfeeding, women described a clash or incongruity between their highly idealised expectations and early breastfeeding problems, making them feel progressively more disillusioned, and less likely to persist (Mozingo, Davis, Droppleman, & Merideth, 2000).

However, it was not solely breastfeeding difficulties that were unexpected. Some AF women revealed that their previous idealised expectations of what the embodied experience of breastfeeding would be like were very different to their actual experiences. The art and media images of serene and contented breastfeeding

women that these participants had seen before the birth seemed far removed from the reality.

> AF Participant: *Stupid photos in the obstetrician's office of women going* [poses as if smiling peacefully down at breastfeeding baby in her arms]. *All those sorts of images that you see everywhere. Movies, you know "I looked at my baby and it was this, and it was that … and when I fed her or him, I felt this"*

These comments are similar to those made by primiparous Australian women (Schmied & Barclay, 1999) in an earlier study, which found that the participants had been unable to imagine or prepare for the embodied reality of breastfeeding. For some women breastfeeding was experienced in a connected, harmonious and sensual way, while for others it was a disappointing and distressing experience. This adds richness to previous findings showing that maintaining realistic expectations has a positive impact on breastfeeding duration (Whelan & Lupton, 1998), though the area would benefit from further research.

5.2.8 Self-esteem

The CBF, AF and HP groups believed that the woman's self-esteem impacts on how long she will breastfeed for. While most participants were content to list this as a factor without further discussion, one AF participant offered some insight into the effect of self-esteem on the woman.

> AF Participant: *… low self esteem, that's going to effect how you cope with emotional stress and feeling alone, and … asking for help*

Greater self-esteem was also named among factors associated with longer breastfeeding duration in some previous research (Seacat, 2000; Whelan & Lupton, 1998), suggesting that further investigation of this factor is warranted.

5.2.9 Body Image

The FBF, CBF and HP groups included body image among the factors influencing breastfeeding duration. Again there was little discussion around this factor after its listing, but when asked to expand on its meaning one FBF group participant answered:

> FBF Participant: *It's how comfortable you are in your skin really isn't it?*

Body image is thought to be closely allied to self-esteem (Porritt, 1984), and is defined as the subjective image one has of one's own body, specifically in relation to the individual's judgements about how they are perceived by others, and how well they have adjusted to this perception (Reber & Reber, 2001). Body image was one of 16 factors significantly associated with scores on depression, anxiety and life satisfaction when measured at five points between 1 and 12 months postpartum in one study (Gjerdingen & Chaloner, 1994). It is also thought to effect the woman's decision about breastfeeding in public (Hauck, 2004). The hypothesis that body image may influence breastfeeding duration appears untested, but the literature includes two studies suggesting that the woman's body image before and during pregnancy (at 32 weeks gestation) is associated with infant feeding choice (Barnes, Stein, Smith, Pollock, & Team., 1997; Huang, Wang, & Chen, 2004).

5.2.10 Psychological Reactance

Both the CBF and AF group raised factors related to psychological reactance, or the motivational state created when personal freedoms are threatened or removed (Snyder & Wicklund, 1976). The AF mothers' specific objections to the perceived *"restrictions imposed by breastfeeding on the mother's time and diet"* (including alcohol consumption) were included with this factor. Also included was the CBF group item titled "*wanting your body back*".

> CBF Participant: … [wanting your body back is] *a common thing I think, just being able to wear the dresses that you like. And a nice bra, and that sort of stuff.*

While no study could be found which explores the relationship between breastfeeding behaviour and psychological reactance, previous researchers have found that some formula feeding mothers express a strong desire to re-establish their identities as separate individuals and non-mothers (Earle, 2002), and these findings may be related. AF mothers in the current sample spoke of their yearning for time without the baby when they could be free to run errands, spend time alone or pursue their own interests.

> AF Participant: … *there's this expectancy that part of motherhood is that you are attached at the hip … and I **wanted** to be alone, and I **wanted** to go to the bank and leave her with her grandmother and whatever.*

AF Participant: *… even now I sometimes I think … I'm giving myself so much to* [baby's name] *and so much to my husband, like when do you have time, for, for me, you know? And I suppose sometimes … I miss that, like I miss "me time".*

In contrast, far from wanting to leave the baby with another caregiver this CBF participant admitted to using breastfeeding as an excuse to keep the baby constantly in her care. This desire to retain control of the baby in some women has also been reported by previous researchers (McNatt & Freston, 1992).

CBF Participant: *… my husband's mum … she's all over him, and* [because I'm breastfeeding, I can say] *"No, it's ok, he wants to be fed, he's hungry, it's my time, you can't … he's mine now".*

Research suggests that breastfeeding is perceived by many women to be more restrictive than artificially feeding, because it allows no breaks from feeding the baby (Sullivan, 1996; Zimmerman & Guttman, 2001). This has been identified as a barrier to breastfeeding (Stewart-Knox, Gardiner, & Wright, 2003), and a major reason for weaning (Bulk-Bunschoten, van Bodegom, Reerink, Pasker-de Jong, & De Groot, 2001; Kirkland & Fein, 2003). Women describe a strong desire to re-establish their identities as separate individuals and "non-mothers" (Earle, 2002), and describe breastfeeding as an unselfish, demanding and giving act involving many personal sacrifices (Hauck & Irurita, 2002).

Reactance theory contends that an individual will be motivationally aroused whenever any of his or her freedoms to engage in various behaviours are eliminated, or threatened with elimination (Wicklund & Brehm, 1968). This psychological reactance is directed toward restoring the threatened or lost personal freedom. Previously proffered examples include resistance to social influence, invasion of personal space, favours that obligate the person, and the influence of psychotherapy (Hong & Faedda, 1996). While originally thought to be situation specific, this phenomenon is now thought by theorists to be a personality trait, and psychometric scales have been constructed for its measurement (Hong & Faedda, 1996).

5.2.11 Intimacy

The woman's degree of comfort with physical intimacy was a theme contained within the HP group data, and was raised as a factor by the CBF group.

The woman who is breastfeeding her infant may experience intimacy in a number of ways (Dignam, 1995), and these participants believed that women who were uncomfortable with physical intimacy were at a disadvantage with breastfeeding. The group participant's understanding of this is reflected in the example quote which follows.

> HP Participant: *… some women don't like people touching their bodies ... They don't even like the baby touching their body.*

This contention is in line with previous Australian research (Schmied & Barclay, 1999) which described breastfeeding as a pleasurable, sensual and intimate experience for some women, and difficult, unpleasant and disruptive for others. Schmied and Barclay also report that some women enjoyed the uncertainty or blurring of their body boundaries and the connectedness with the baby inherent in breastfeeding, while 65% of women overall sometimes found the need for proximity to the infant overwhelming, and wanted separation.

5.2.12 Achievement Striving

The FBF and HP groups believed that individual differences in terms of achievement motivation or achievement striving had an influence on breastfeeding duration. Quotes from both groups suggested that strong achievement striving may be an advantage to breastfeeding duration.

> FBF Participant: *… I'm gonna do it, and I'm gonna win, and I'm gonna get there to that finish line. For me it's about … setting a goal and just getting there and achieving.*

The need for achievement is a social need that directs people to strive for excellence and success (Lefton, 1994). People with a high need for achievement constantly strive for better performance, they believe in their self-efficacy and in the importance of effort in determining performance (Carr, Borkowski, & Maxwell, 1991; Lefton, 1994). Rentschler (1991) found that achievement motivation during pregnancy was positively related to success in breastfeeding, and Seacat (2000) also identified motivation as one of several psycho-social factors predicting breastfeeding outcome. Other related research found that some primiparous Australian women describe breastfeeding as an "identity project", indicating their willingness to persevere with breastfeeding in order to achieve their identity as a breastfeeding mother (Schmied & Barclay, 1999).

5.2.13 Resilience

The FBF and HP groups believed that individual differences in resilience have an influence on breastfeeding duration. Though definitions vary, resilience is generally described as a dynamic process which involves the maintenance of adaptive behaviour by individuals in the face of significant adversity (Luthar & Cicchetti, 2000).

> FBF Participant: *You know, I've not been sick since I've had* [baby's name] *… It's like the body's just a fine tuned factory.*
>
> *HP Participant: …with resilience, you know they've just got this … you know, getting on power, like they just get on with it.*

While important advances have been made in understanding resilience in recent decades (Luthar & Cicchetti, 2000), no evidence of research investigating the relationship between resilience and breastfeeding behaviour could be found in the current literature.

5.2.14 Depression

Depression was identified as a factor influencing breastfeeding duration by the AF and HP groups. While there was little discussion around the topic, both groups believed that the experience of depression was a threat to breastfeeding due to its physical and emotional impact. The breastfeeding clinicians also believed that many sufferers of depression were encouraged to wean by health professionals, perhaps due to an erroneous belief that all antidepressant medication is unsafe during lactation (Brockington, 2004; Division of Mental Health & St George Hospital and Community Health Services, 2004).

> HP Participant: *… a lot of women that … are diagnosed as post natal depression are automatically, one of the first things to go, is their breastfeeding, and I think, a lot of that's probably like from misinformation.*

One large Australian study investigated the impact of postnatal depression on breastfeeding duration by surveying and interviewing 1,745 women postnatally, and at 2, 6 and 12 months postpartum (Henderson, Evans, Straton, Priest, & Hagan, 2003). Eighteen percent of these women were diagnosed with postnatal depression in the first 12 months. The onset of depression occurred at or before cessation of breastfeeding in 93% of cases, and was associated with low self-confidence, guilt,

the inability to cope, losses in maternal-infant interaction and the perception of the baby's behaviour as difficult. At any time in the first year, depressed women in this sample had a 1.25 times greater risk of weaning than non-depressed women. Numerous other studies have also found an association between postnatal depression and breastfeeding duration (Dunn, Davies, McCleary, Edwards, & Gaboury, 2006; Hatton et al., 2005; Henderson, Evans, Straton, Priest, & Hagan, 2003; Papinczak & Turner, 2000; Seimyr, Edhborg, Lundh, & Sjögren, 2004; Tammentie, Tarkka, Åstedt-Kurki, & Paavilainen, 2002; Taveras et al., 2003), leaving little doubt of the negative impact of maternal depressed mood on the maintenance of breastfeeding.

5.2.15 Anxiety

Anxiety was identified as a theme existing within the AF group data, and was raised by the HP group under the titles "*drama queens*" and "*precious babies*", both of which attracted discussion describing highly anxious mothers.

> HP Participant: *… right from the start, everything's going to be a drama, no matter how smoothly it goes it's going to be a drama.*
>
> HP Participant: *… when it comes to it, they're so stressed about it all … over-desire to do the "right" thing, and an over-desire to do the, the expected thing.*

Anxiety is a common mental health concern, and is characterised by autonomic arousal and fearfulness (WHO, 2000). Maternal trait anxiety has been found to be related to a preoccupation with thoughts of infant safety and well-being (Feldman, Weller, Lockman, Kuint, & Eidelman, 1999), perhaps underlying the commonly reported concerns among women regarding the quality or quantity of their breastmilk (Hill, 1992).

> AF Participant: *… you think, is something wrong with my milk?*

Some participants in the current study also appeared to worry about the impact of breastfeeding on their own health.

> AF Participant: *… there's your own health as well. Whether you know, you're gonna get mastitis, or whether your milk ducts are going to block up.*

Anxiety has been associated with breastfeeding duration in one Australian study (Papinczak & Turner, 2000), but further research is needed to establish the possible role of anxiety in influencing breastfeeding behaviour.

5.2.16 Perfectionism

The HP group listed perfectionism among the psychological factors influencing breastfeeding duration. Research into the construct of perfectionism has suffered from variations in its definition, with several differing definitions being offered by researchers over time (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; Shafran & Mansell, 2001). However, a review of research in the area (Shafran & Mansell) concluded that perfectionism can be divided into two categories, either normal/positive or neurotic/negative. People with positive perfectionism set high standards for their performance in a similar way to people with negative perfectionism, but feel satisfied when those standards are achieved. However, people with negative perfectionism can never do enough to feel satisfied with their performance. This was reported by the HP group, who noted that some clients set high and at times unrealistic goals for breastfeeding and mothering.

> HP Participant: … *they have an expectation to be able to achieve at this level.*

At times this striving for perfection was thwarted by the baby's needs or behaviour, and this could be difficult for the mother to accept.

> HP Participant: *If they're … a perfectionist, they're not going to be adaptable to this baby that doesn't … fit into their little box.*

However, no research exploring a possible link between breastfeeding duration and perfectionism could be found in the extant literature.

5.2.17 Assertiveness

The HP group believed that the woman's assertiveness was important to breastfeeding duration. To be assertive, persons must have confidence in their judgement and high enough self-esteem to express their opinions or needs (Sadock & Sadock, 2003). The HP group believed that the early days of motherhood (particularly the first week following the birth) posed special challenges which placed this assertiveness at risk, though no research supporting this contention could be found.

> HP Participant: *And even the really well educated people who know what they should be doing, they find it very difficult to actually cope and assert themselves in those situations.*

5.2.18 Need for Control

The FBF group talked of "*control freaks*", who they believed had a strong need to maintain control over all aspects of their lives.

> FBF Participant: *… being in control of your body … as well as control of feeding the children and your family … and controlling your own decisions too.*

This was seen as a threat to breastfeeding due to the constant change inherent in mothering, and the resultant need for mothers to be flexible, and to accept a partial loss of control over their daily lives to the baby's needs.

> FBF Participant: … *you **can't** stop* [and rest] *because you're a control freak and you've gotta run that house!*

Controlling is listed among the "neurotic" defence mechanisms encountered in obsessive-compulsive and hysterical patients, as well as in adults under stress (Sadock & Sadock, 2003). As a defence mechanism, controlling is described as an attempt to "*manage or regulate events or objects in the environment to minimise anxiety and to resolve inner conflicts*" (Sadock & Sadock, p.208). Hoddinott and Pill (1999) contend that mothers feel a loss of control with breastfeeding due to unmet expectations, difficulty coping, and a reduction in competence, and that this may prompt a change in feeding method in order to take control. However, no further research could be found which explores the effect of need for control on breastfeeding behaviour.

5.3 Motivating Attitudes

The second category of factors raised by the groups contains motivating attitudes. Attitudes are defined as "*lasting patterns of feelings, beliefs, and behaviour tendencies toward other people, ideas, or objects which are based on our experiences, shape our future behaviour, are evaluative in nature, and serve certain functions*." (Lefton, 1994, p. 574). Attitudes are shaped both by how others perceive us and by how we perceive ourselves, and can determine whether we respond to a given situation positively or negatively, with enthusiasm or reluctance (Lefton). Four specific attitudes were raised by group members as factors influencing breastfeeding duration, and are summarised in Table 5.2.

Table 5.2.

Factors Related to Attitudes Influencing Breastfeeding Duration

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Faith in the natural process of breastfeeding*	A	a	A	A
Chosen method is easier / more convenient	A	A	a	
Belief in the health and other advantages of breastfeeding	AA	a		A
Wanting to treat your children equally		a		

Note. A = selected among the most important factors; a = raised by the group but not selected as among the most important. * This factor chosen for inclusion in Phase 2.

5.3.1 Faith in the Natural Process of Breastfeeding

Faith in the superiority of breastfeeding as the natural, species-specific method of infant feeding was raised as a factor by all groups, and selected as among the most important factors by all but the CBF group. The breastfeeding women and health professionals held strong beliefs about the natural superiority of human milk, which may have arisen from a greater faith in natural processes in general.

> *FBF Participant: … believing your body is designed for this, it is natural. It is designed to work and it will.*
>
> FBF Participant: *It's like it's genetically blueprinted to that baby, so why wouldn't you?*
>
> CBF Participant: … *because it's the way it's **meant** to be its **gotta** be healthier for the baby.*

In contrast, the AF women entitled this factor "*degree of faith in the commercial product".* They acknowledged that breastfeeding was best for their baby, but at the same time expressed their faith in the manufactured alternative.

> AF Participant: *… after the first bottle … I thought, its fine. I didn't have any doubts at all.*
>
> AF Participant*: … you know, it might actually work better* [formula].

Once the baby had been weaned to formula, AF group members felt very comforted by knowing how much milk their baby had had at each feed. It took

away the doubt and uncertainty they felt when breastfeeding and made them feel more in control.

> AF Participant: *I got great satisfaction watching a bottle empty into his mouth, and I'd go, Right, he's had … and I know how much, and I don't have to poke and prod and wonder.*

The woman's faith in natural infant feeding processes as opposed to manufactured products was identified as a factor influencing breastfeeding behaviour in one other Australian study (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005). In general, the present data suggests that while some women feel able to relax and be sure the baby's getting everything they need from breastmilk, others feel more comforted and in control of the baby's nutritional needs using the manufactured product.

5.3.2 Chosen Method is Easier / More Convenient

All three groups of mothers (FBF, CBF and AF groups) believed that their chosen method of infant feeding was easier and/or more convenient than the alternative, and raised this as a factor influencing breastfeeding duration. The FBF and CBF groups included this among the most important influences.

> FBF Participant: *… I know that it's easier and quicker, and more efficient, and cheaper.*

> AF Participant: … *my husband now can get up and give it a feed.*

These results are consistent with previous research into the infant feeding attitudes of parents (Shaker, Scott, & Reid, 2004; Zimmerman & Guttman, 2001).

5.3.3 Belief in the Health and Other Advantages of Breastfeeding

The FBF, CBF and HP groups believed that the woman's belief in the health and other advantages of breastfeeding increases breastfeeding duration, and the HP group voted this among the most important influences. The FBF group raised this factor under two related titles ("*Breastfeeding provides the best nutrition for baby*" and "*Health benefits and advantages of breastmilk*") and voted both among the most important. These two items were very similar when discussed, and have been subsumed within this factor for discussion. Comments were also similar across the three groups, reflecting the woman's strong belief that breastfeeding conferred important health and advantages on their baby.

> FBF Participant: *… despite the difficulties breastfeeding, despite the pain and bleeding nipples, despite illness with mastitis, I knew it was best.*

While breastfeeding knowledge was raised as a separate factor, knowledge of the health and other benefits of breastfeeding were thought to underlie this belief, and came from numerous formal and informal sources, including through reading.

> FBF Participant: *I've read that it gets the mother's body back into shape … and it's so good for your body. And even I have read that there's a possibility that breastfeeding reduces the incidence of breast cancer.*

For some, this belief was also strengthened by personal observation and experience.

> FBF Participant: *… his twins got chicken pox … they were both bottle fed … one was red from head to toe and hospitalised because she couldn't even open her mouth, and the little boy, the virus went into the brain and he started fitting … and my husband said "Thank goodness you were so stubborn in the beginning with* [breastfeeding] *and you persevered" I mean, my daughter had the same virus, and she only had about half a dozen spots.*

5.3.4 Wanting to Treat your Children Equally

One member of the CBF group believed that infant feeding choices could be influenced by the desire to treat all of the children in the family equally. She believed that having breastfed her first child for 12 months, it would be unfair to wean her second child earlier than this.

> CBF Participant: *I couldn't possibly conceive of not breastfeeding the second child after giving the first … the best that I could give … Or what I thought was the best. It would have made me feel guilty, to think that one was breastfed and one wasn't.*

While this attitude has so far gone unreported, research does suggest that women most often repeat the infant feeding decision they made with their first child with later children (Da Vanzo, Starbird, & Leibowitz, 1990).

5.4 Motivating Experiences

The data also included four experiential factors which participants believed were a source of motivation either to breast or formula feed. Results for these four factors are contained in Table 5.3 and discussed in the section which follows.

Table 5.3.

Factors Related to Motivating Experiences Which were Perceived as an Influence on Breastfeeding Duration

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Early problems		A	A	aa
Enjoying breastfeeding	a	a		a
Effect of breastfeeding on sex life	a	a		
Tiredness		a		

Note. A = selected among the most important factors; a = raised by the group but not selected as among the most important.

5.4.1 Early Problems

The detrimental effect of early problems on breastfeeding duration was raised by members of the CBF, AF and HP groups (entitled "*an easy start to breastfeeding*" and "*mother's emotional reaction to the birth*"), and voted among the most important factors by the CBF and AF groups. As suggested by the assigned titles and the example comments below, these problems were not confined to infant feeding, but encompassed other problems occurring during the pregnancy, birth and in the period shortly after the birth, which had an effect the woman's physical or emotional wellbeing.

> AF Participant*: I'd already had 8 months of, yeah basically, parasite sucking the life out of me … that was just another factor, on top of everything else that made me feel like I'm just so sick of this.*
>
> HP Participant: … *if she's had a bad birth experience then her body has failed her. I mean, some people feel this way, it's failed her this way, is it going to fail her with breastfeeding as well?*

Creedy (1999) found that childbirth events involving personal injury and threat to life gave rise to trauma reactions in the mother. Some women in Creedy's

study reported the early onset of trauma symptoms, avoiding contact with the baby, and the experience of depression. These findings highlight the need for health professionals to acknowledge the unique nature of childbirth for each woman, and to attend to the emotional aspects of care if adverse psychosocial consequences which may be expected to affect mothering and breastfeeding are to be avoided.

5.4.2 Enjoying Breastfeeding

Members of the FBF, CBF and HP groups believed that the enjoyment of breastfeeding is a factor in its continuation. Discussion among participants in the breastfeeding groups suggested that the source of this enjoyment for the mother came predominantly from observing and communicating with the baby.

> FBF Participant: *… I love it. She's lying there, and it's just put her to sleep, it's just relaxed her…*

However, the HP group did not believe that this enjoyment of breastfeeding is shared by all mothers. For this reason, HP group participants believed that mothers who did not enjoy the experience of breastfeeding needed strong alternative motivation to continue.

> HP Participant: [my friend] *just didn't enjoy it. It wasn't her cup of tea … she did it because she believed in the value.*

One previous Australian researcher reported that mothers who reported enjoying breastfeeding and being satisfied with breastfeeding were more likely to be breastfeeding at 4 months than other mothers in the sample (Redman, Watkins, Evans, & Lloyd, 1995). However, research conducted in the United States showed that women who were employed outside the home were less influenced by this enjoyment (McKinley & Hyde, 2004), suggesting that the effect of this variable may depend on contextual factors.

5.4.3 Effect of Breastfeeding on Sex Life

The FBF and CBF groups raised the effect of breastfeeding on the couple's sex life as an influence on breastfeeding duration for some women. Several issues were discussed in relation to this factor, including the feelings of the woman's partner, who may be hesitant to incorporate the realities of infant feeding with his previous image of the breast as a sexual object.

> CBF Participant: *My partner says, "I'm not touching them, that's bubbas food"* [laughs].

The women also raised several issues which affected their own sexual experiences as breastfeeding women. These included concerns regarding hygiene, discomfort, and the perception of reduced sexual pleasure associated with the breasts during the period in which the woman is breastfeeding.

> FBF Participant: [my friend] *didn't want him to touch her because, you know, "they're the baby's don't touch them, I don't want them germs …"*
>
> CBF Participant: …*sometimes they're just sore, they're so full that they're sore and you just don't want anybody to touch them and you just go … "don't touch me".*
>
> CBF Participant: [breast-focussed foreplay] *doesn't give the same pleasure maybe that it would if you were not breastfeeding.*

One study showed that sexual problems are common after a birth regardless of feeding method (Barrett et al., 2000). Eighty-three percent of women in Barrett et al's study reported sexual problems in the first 3 months after the birth, declining to 64% at 6 months. However at 6 months, only previous dyspareunia and current breastfeeding were significantly related to the occurrence of sexual problems. Other research indicates that women who breastfeed are more likely to experience decreases in sexual functioning than those who bottle-feed, especially decreased desire, though this effect does not persist in the longer term (Glazener, 1997; LaMarre, Paterson, & Gorzalka, 2003; Snellen, 2005). Of further concern is the finding that only 15% of women suffering a postnatal sexual problems report discussing these problems with a health professional (Barrett et al., 2000).

5.4.4 Tiredness

The CBF group believed that the mother's experience of tiredness and fatigue may also influence breastfeeding duration.

> CBF Participant: *I was just so tired, I didn't want to get up and feed when I had to … it just creeps up on you I think.*

Fatigue and tiredness is frequently reported among the mothers of young babies (Barclay, Everitt, Rogan, Schmied, & Wyllie, 1997; Fisher, Feekery, & Rowe-Murray, 2002; Gjerdingen & Chaloner, 1994; Nyström & Öhrling, 2004), and this tiredness is sometimes offered by mothers as a reason for weaning from the breast (Chan, Nelson, Leung, & Li, 2000). However, there are many possible causes for

fatigue among the mothers of young babies (Milligan, Lenz, Parks, Pugh, & Kitzman, 1996), and little evidence exists of a clear link between breastfeeding and level of fatigue (Tattam, 2003). However, maternal sleep deprivation and resultant tiredness has been associated with the onset of maternal depression (Dennis & Ross, 2005), a known risk to breastfeeding duration.

5.5 Mothering Issues

Four factors contained in these data were primarily related to the woman's experiences, beliefs and behaviours in her role as a mother. These four factors (presented in Table 5.4) will be discussed in this section.

Table 5.4.

Factors Primarily Related to Mothering

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Mother's priorities and mothering self-efficacy**	A	A	A	AA
Feeling needed	x	A	x	
Selflessness and giving to the baby	A			
Reflective functioning		x		

Note. A = group selected among most important factors; a = raised by group but not selected as most important; x = identified as a theme in the group discussions.
* = This factor chosen for inclusion in Phase 2.

5.5.1 Mother's Priorities and Mothering Self-efficacy

Aspects of the woman's identity as a mother, specifically her level of mothering self-efficacy and the placement of the baby in her life priorities, was the only factor voted as amongst the most important by every group. Despite its perceived importance, this factor was difficult for participants to articulate and was considered multi-faceted. However, in attempting to describe this factor the FBF and CBF groups asserted that it was important for the mother to consider the baby her first priority.

CBF Participant: *You have to put your baby first. Too bad about tea, too bad about the ironing and the washing, and too bad if you're husband's things aren't done. The baby comes first, you feed them first and then you worry about yourself.*

FBF Participant*: You've just got to set your priorities sometimes …*

The data suggests that FBF and CBF group women were highly motivated by the intensity of their feelings toward the baby, perhaps explaining their willingness to place the baby's needs above their own. As can be seen in the example comment below, discussions around these women's emotional reaction to their baby were often intense, joyful and reverent.

FBF Participant: … *overwhelming desire to do the best thing for this child that's been entrusted to you ….*

This finding may be related to research which has found that breastfeeding women give more baby-centred reasons for their infant feeding choice than artificially feeding women (Bevan, Mosley, Lobach, & Solimano, 1984; Wagner et al., 2006). Maintaining focus on the baby's needs seemed to help these women to cope with the demands of motherhood, while the AF women focussed more on the workload, and seemed more bothered by the constant demands of motherhood.

AF Participant: … this is just getting tiresome having to do this day after day … expressing milk that, yeah, it's a bit of an arduous job after a while. See, it seems more like a job, something that you ***have*** *to do, rather than something that you* ***want*** *to do.*

AF Participant*: … my whole life was becoming motherhood. To me that was not what it was all about.*

This difference is further exemplified by the stories shared in the groups with regard to night time feedings. These quotes suggest that while the FBF mother enjoyed the silent communication between herself and her baby during comparatively quiet night time feeds, the AF mother did not experience this in the same way and preferred to use this quiet time to catch up on chores.

FBF Participant: *… when I feed during the day … they're so busy, they're looking around … you know, a bit restless. But when I feed during the night, I find that quite calming because it's black, there's no disturbances or anything … during the night time feeds, I feel that … bonding sort of a thing more.*

> AF Participant: *I couldn't sleep and feed or rest and feed* [when I was breastfeeding]*, it was I'm up for a good hour dealing with it. I'd much rather get out of bed. I would put the formula on, and heat it, and you know, while that was happening I might fold up some of the baby's laundry or you know,* ***do*** *something and then go back to bed. A lot of the time I'd do that and then give it to my husband, who'd feed her the bottle. And so, ten minutes later he was back off to sleep because she'd been fed and all of that.*

The HP group raised two separate but related items which were included with this factor, and voted each as among the most important. The first was the woman's "*goodness of fit*" with the mothering role, which focussed on how comfortably the woman adapts to motherhood.

> HP Participant: [some women are] *quite happy to bottle feed, because it means then that they can leave the baby, and they can go and do whatever they want. It's not that the baby's not cared for or loved, but they don't have to have that closeness.*

The second factor raised by the HP group was the woman's mothering self-efficacy or her confidence in her ability to successfully mother her child. The group felt this was often easily gauged by observing the woman's physical handling of the baby.

> HP Participant: *… she just cuddles* [the baby] *in nicely… it doesn't even look awkward … just natural. She didn't ask you how to pick it up, she didn't ask you how to wrap it up, doesn't ask you how to put it down. Doesn't need a bathing demonstration, "No, I should be able to do it".*

These findings are supported by previous research which suggests that women who perceive themselves competent as mothers tend to breastfeed for longer than those who don't (O'Campo, Faden, Gielen, & Wang, 1992; Tarkka, Paunonen, & Laippala, 1999). Parenting self-efficacy seems to be relatively stable when first measured during the woman's pregnancy and again 4 weeks after the birth, and is speculated to relate to how the mother herself was nurtured (Wood, 1995).

5.5.2 Feeling Needed

The mother's reaction to the baby's dependence and feeling needed by the baby is a related factor raised by participants. This factor was selected by the CBF

group as an important influence on breastfeeding duration, and was identified as a theme in the FBF and AF group discussions. Overall, the FBF and CBF mothers found the baby's reliance on them enjoyable, sometimes even experiencing the baby's demands as expressions of love, while the AF mothers experienced this differently.

> CBF Participant: *… when he wanted to be fed it was kind of like "I love you mum, I need **you**".*
>
> AF Participant: *… over these, you know, hours and hours of sitting there, looking at this **thing** … sucking on me.*

For mothers in the breastfeeding groups, the increasing independence of the baby signalled by the baby's weaning from the breast was met with feelings of nostalgic regret, while mothers in the AF group enjoyed the reduction in their responsibilities toward feeding the baby that weaning offered.

> CBF Participant: *that's a big thing when you're weaning - feeling needed, because it's like they don't need you anymore. Not rejecting you, but you know, that time has come …*
>
> AF Participant: *… my husband now can get up and give it a feed.*

These findings are in line with those of Schmied and Barclay (1999), who found that some women enjoyed the dependence of their breastfed baby, while others found the intense closeness and continuity between themselves and their breastfed baby intolerable.

5.5.3 Selflessness and Giving to the Baby

The FBF group included selflessness and giving on the part of the mother among the most important factors influencing breastfeeding duration.

> FBF Participant: *Complete feeling of love for the baby, wanting to be selfless, wanting to give.*

While there are almost certainly many factors which contribute to building the willingness and ability to act selflessly, one in particular was discussed by these women in relation to this factor. The women believed that they were more able to maintain a selfless attitude if they looked at their personal sacrifices as a phase, and remembered that in the grand scheme of things; infancy is swiftly over (see Section 5.7.5). No discussion of this factor could be found in the extant literature.

FBF Participant: *… like I was watching on a today program how you could win a trip to Tuscany and … I think, oh I'd love to do that I'll have to do that, I'll have to ring up, and then I think, oh hang on, I've got three kids, and so, and I just think, oh, in a couple of years time I'll do something like that …*

5.5.4 Reflective Functioning

Maternal reflective functioning describes the mother's capacity to reflect on her own and her infant's mental states and internal experiences, and how these underlie behaviour (Dunckel, 2003). This ability arose as a strong theme in the CBF group's discussions. Group members considered their baby as an individual who could be expected to experience the full range of human emotions, and to cry or become unsettled in response to various emotional or mental states.

CBF Participant: *Sometimes they're just cranky. And well they're little people, you know, they've got feelings.*

They accepted that like them the baby would experience natural fluctuations in mood, hunger and behaviour and where possible allowed the baby to dictate his or her needs.

CBF Participant: *… there's days when he wants it, and he wants it **now** you know. It's varied … sometimes they only want a little snack. I kinda think well, I might want a big three course meal, or I might just want a piece of toast, you know? They're just like we are.*

These women also believed in their baby's tendency to mirror their mother's emotions, and therefore that the mother could influence the baby's behaviour through managing their own (and therefore their baby's) emotional states.

CBF Participant: *I really truly believe that babies just – feel what you feel, if you're happy they're happy and if you're sad they're sad.*

Dunckel (2003) found that mothers who breastfeed scored higher on measures of reflective functioning than artificially feeding mothers. Similarly, Wagner et al. (2006) found that the mean personality inventory scores of women who initiated breastfeeding were associated with being receptive to emotional experience, while the scores of artificially feeding women indicated that this group were less likely to acknowledge feeling states as being important than breastfeeding women.

5.6 Social Expectations

The fifth category contained in the data is composed of perceived social expectations, and the effect of these expectations on the woman in terms of her pride or guilt with regard to infant feeding. Results for these two factors are summarised in Table 5.5, and discussed in the section which follows.

Table 5.5

Factors Related to Perceived Social Expectations

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Feelings of pride and guilt	Aa	a	A	
Social pressure & expectations	aa		Aa	

Note. A = selected among the most important factors; a = raised by the group but not selected as among the most important.

5.6.1 Feelings of Pride and Guilt

Feelings of pride or guilt were raised by all three groups composed of mothers, and voted among the most important factors influencing breastfeeding duration by the FBF and AF groups. In Western cultures infant feeding is a highly accountable matter (Murphy, 1999), though how reasonable or even relevant these cultural expectations are given the changing role of women is open to debate. However, the mothers in this study acknowledged these expectations by evaluating feelings about their own infant feeding performance in terms of pride or guilt.

> FBF Participant*: This is **pride** … it is the "right" thing to do.*
>
> CBF Participant*: Satisfaction of achieving successful breastfeeding ... I can do this, a sense of pride.*
>
> AF Participant*: … the guilt you feel when you're not supplying what they need, when they are totally reliant on you. … But also that you're not doing it 'properly' sometimes.*

These quotes suggest that feelings of guilt or pride arise from two separate, yet related sources. Firstly, there's the question of maternal morality, and how well the woman considers she has performed in relation to meeting social expectations with regard to the mothering role. Secondly, there is the pride of achievement, and

how able she is to breastfeed 'properly', and achieve at breastfeeding as a mothering task.

Feelings of pride and guilt in women with regard to infant feeding performance have been reported before (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005; McNatt & Freston, 1992), and it is possible that this pride may contribute to the increases in self-esteem found in women who breastfeed for longer durations (Papinczak & Turner, 2000). However it is the experience of guilt and its probable damage to the woman's self-concept which is most troubling. In one study (Mozingo, Davis, Droppleman, & Merideth, 2000) women who weaned early spoke poignantly about a sense of failure, guilt or shame and had lingering self-doubts following their infant feeding experience, prompting the author to recommend that assistance in resolving these feelings be provided to women who wean early.

5.6.2 Social Pressure and Expectations

The FBF and AF groups raised several items related to the existence and influence of social expectations regarding motherhood. The FBF group called the first item "*expectations placed on the mother*". These expectations applied to success at breastfeeding in addition to other attitudes and behaviours perceived as desirable in mothers, and were acknowledged by both the FBF and AF groups.

> FBF Participant: *… you've got family and stuff who say "Yeah, she knows all about it, she'll be able to do it".*
>
> AF Participant: *…my mum's just got this immaculate house …. I've gotta have a house like hers. And of course I still sort of get guilts when she comes to visit.*

The second item raised by the FBF group was titled "*community attitudes and the social acceptance of breastfeeding*". Discussion of this item centred on the women's perception of a focus on breasts as sexual objects in Australian culture. The seemingly opposing sexual and nurturing roles allotted to women's breasts was seen as confusing, and influenced the mother's decisions regarding breastfeeding in public.

> FBF Participant: *… other cultures …see the woman's breast as the vessel for nutrition for the baby, they don't see it how we do, sexually.*

The AF group voted social pressure and expectations as among the most important factors influencing breastfeeding duration. In addition, this group

believed that the "*reluctance to breastfeed in public"* influenced breastfeeding duration, and this factor was included with social expectations. Some AF group members admitted to feeling uncomfortable with breastfeeding in public, while in contrast FBF members appeared able to do so with pride and confidence.

> AF Participant: [Breastfeeding in public is] *a modesty issue, you know … What people think, like a disgust sort of thing … the idea of it all* ***hanging out*** [gesturing toward breasts]*… no.*
>
> AF Participant: *I'm not going to sit in the mothers room putting her on, and her pulling off, and putting her back on again … I suppose it's because people are looking at me, judging me …*
>
> FBF Participant: [I] *sit on one of the little piers outside the shop rather than go into the parents room because … I feel like it's a privilege to be able to breastfeed in public … and if I can help educate others in the community, particularly mothers who might be pregnant, or young girls, like even teenagers, just so that they can … see it happening …*

Perceived societal expectations and social embarrassment are known to influence a mother's decision to breastfeed in public (Hauck, 2004; Stewart-Knox, Gardiner, & Wright, 2003). In fact research suggests that despite legislation protecting the rights of Australian women to breastfeed their infants in public places, acceptance of public breastfeeding remains limited in Australian culture (McIntyre, Hiller, & Turnbull, 1999, 2001).

Finally, the transcribed AF group discussion revealed common feelings of failure among group members with regard to both breastfeeding and mothering in general. These participants believed that their mothering abilities fell short of social expectations.

> AF Participant:*… you're supposed to have it all under control, and be able to shove your husband off to work in the morning and go "See ya!" and have everything on the table by the time you get home. That's never going to happen in my house*
>
> AF Participant: *You see other mothers … who have one child, 3 months, 5 months, and they* ***do*** *seem to know everything. Like my sister-in-law gives me advice, and I sort of think, but hang on, you've only got 1 month on me, like how do you …* ***know?*** [laughing] *… and*

*I sort of sit there going, "Oh, really? Oh, right, so you **can't** give them cow's milk until they're 12 months old?".*

5.7 Other Social and Support Issues

In addition to perceived social expectations and social pressures regarding infant feeding, participants raised several other factors which were related to social issues. These six factors are presented in Table 5.6, and discussed in the section which follows.

Table 5.6.

Factors Related to Other Social and Support Issues

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Family culture / Mother breastfed	A	a	a	Aa
Support of partner*	A	a	A	
Misinformation/Conflicting advice	a	aa	x	x
Influence & support of friends	a	aa	a	
Influence of & attitude toward health professionals	a	a	a	
Feeling alone and isolated			a	

Note. A = group selected among most important factors; a = raised by group but not selected as most important; x = identified as a theme in the group discussions.
* = This factor chosen for inclusion in Phase 2.

5.7.1 Family Culture / Mother Breastfed

The infant feeding culture of the woman's family, including whether or not the woman's mother had breastfed, was raised by every group and counted among the most important psychological factors influencing breastfeeding duration by the FBF and HP groups.

CBF Participant: *… a lot of my sisters having had children, and just being around babies and children, just made me so comfortable with the whole idea of having my own … So, it wasn't such a huge deal, I think.*

> FBF Participant: *It just helped, you know, I think just knowing* [that my mother had breastfed].

The HP group's "*positive role model*" item was also included with this factor, due to its focus on the presence of appropriate role models within the family.

> HP Participant: *… role model it from you know, the way they were brought up and … influences from their family.*

This contention is backed by research which found that women who had regularly seen a relative or friend successfully breastfeed and described this experience positively were more confident about and committed to breastfeeding, and more likely to succeed (Hoddinott & Pill, 1999).

The woman's response when asked whether or not her own mother had breastfed has been measured in several studies which suggest no relationship between this and breastfeeding duration (e.g., O'Brien & Fallon, 2005). However, other researchers have found that women whose own mother breastfed are more likely to plan to breastfeed (Middleton, 2005), to initiate breastfeeding (Fitzpatrick, Fitzpatrick, & Darling, 1994; Riva et al., 1999; Salt, Law, Bull, & Osmond, 1994; Scott, Landers, Hughes, & Binns, 2001b), and to breastfeed successfully in the first month (Entwisle, Doering, & Reilly, 1982). These findings suggest that there may be a link between the early infant feeding behaviour of mothers and their daughters. While little has been done to explore this influence further, one author reports that mothers who were breastfed themselves nursed their infants more at 1 month than those who were artificially fed (Isabella & Isabella, 1994). This practice may assist in establishing and maintaining the woman's breastmilk supply, thereby contributing to the early differences observed in the research.

5.7.2 Support of Partner

The support of the woman's partner was raised by all three groups composed of mothers, and the FBF and AF groups selected this amongst the most important factors influencing breastfeeding duration. The discussion reveals that these mothers considered the partner's support and assistance as important to continuing breastfeeding.

> AF Participant: *… if I didn't have my partner there I don't think I would've even tried.*

FBF Participant: … *he was very helpful when I was having trouble with … latching on and things, and he'd say … "you just sit there, and I'll show you because I watched".*

In the face of the rapid change sparked by the arrival of a new baby, some women seemed to take their cue from their partner with regard to accepting and adjusting to these changes. They also appeared to use his reactions to create a benchmark for success in their mothering performance. Illustrating this, all three groups mentioned the importance of having a partner who was able to accept and value the time the mother spends feeding the baby.

CBF Participant: *… they do get jealous of you sitting down and feeding all the time and they think "well, where's my tea?", and they're like, "what have you done all day?".*

If the woman's partner was critical of the amount of time spent feeding, or believed she was not performing as well as she should, the mother felt guilty or inadequate, and the reverse was also true.

AF Participant: *… he was really good, he'd say … "Don't worry about that stuff, don't worry, I don't care" and then I started thinking oh well, it's alright then.*

This finding is in line with the contentions of previous authors who reported that women use their expectations and the expectations of significant others as a benchmark for evaluating their success as mothers (Hauck & Irurita, 2003).

Rempel and Rempel (2004) also found that the degree to which women feel good or worried about breastfeeding may in part be a response to their partner's positive and negative messages. The women in Rempel and Rempel's study behaved more in accordance with what their partners thought they should do with regard to breastfeeding duration than what they had originally intended to do themselves. These results highlight the significant influence wielded by fathers with regard to breastfeeding duration, and support the findings of previous authors who have reported longer breastfeeding durations among women who perceive their partner as supporting breastfeeding (Bevan, Mosley, Lobach, & Solimano, 1984; Scott, Landers, Hughes, & Binns, 2001a), or preferring breastfeeding (Landers, Hughes, & Graham, 1998; Scott, Landers, Hughes, & Binns, 2001b).

5.7.3 Misinformation/Conflicting Advice

All four groups believed that misinformation and conflicting advice offered to breastfeeding women could influence their breastfeeding duration. Participants believed that women are exposed to misinformation and conflicting advice from various sources including from health professionals, family, friends, strangers and even traditional wisdom. Illustrating this, the FBF and CBF groups both raised factors titled "*Old wives tales*". They believed that potentially damaging fallacies regarding breastfeeding are common in our society, and often repeated to new mothers.

> FBF Participant: *… they've been told that because they've got small breasts they won't produce as much milk, or because they're fair skinned they'll get sore nipples, so they lose confidence.*

The HP group also raised concerns about infant feeding information provided by some health professionals and support organisations.

> HP Participant: *… they get all this misinformation from* [name removed]*, so they stop breastfeeding, and then find out down the track that they didn't need to, and then they've got all these issues they're dealing with …*

The CBF group raised "*conflicting advice*" as a second, related factor, and these concerns regarding the impact of conflicting advice on breastfeeding women were also voiced by the AF group. The provision of conflicting or inconsistent breastfeeding information given to mothers has long been recognised as a threat to breastfeeding duration, particularly in the early weeks when input from health professionals is at its greatest (Dykes & Williams, 1999; Simmons, 2002).

> AF Participant: *The nurses would come in and, you know, they'd all have different ideas on how to do things. You'd have another nurse come in … and say "Oh no, you've gotta do it this way …." Thinking, oh, I was just told this afternoon to have it another way …*

However, the CBF and AF group discussions suggest a difference between these two groups in their experience and handling of conflicting advice. AF group members tried to follow each new set of instructions and incorporate all advice offered, while CBF group members were more likely to be selective and ignore advice which they did not find helpful.

AF Participant: *Fill me with your information, and I will go off and do it.*

CBF Participant: *… they had the different lactation people coming in and showing me how to put him on, and like when they'd gone I'd just do it... the way I just did it.*

CBF group members believed that conflicting advice with regard to breastfeeding was inevitable, and that its impact would vary among women, largely dependent on how confident and assertive the woman was at the time.

CBF Participant: … *sort of associated with … confidence and assertiveness … because, I mean it's understandable that you'll get lots of different information from people isn't it?*

5.7.4 Influence and Support of Friends

All three groups of mothers (FBF, CBF and AF groups) listed the influence or support of friends as impacting on breastfeeding duration. The ability to discuss mothering and breastfeeding issues in a safe and accepting environment was valued by participants, as seen in the example comment below.

AF Participant: *I think you need someone who you can totally, be yourself, and not sort of censure what you say all the time. Like, "oh, you're a lactation consultant, therefore I have to talk about these things in this way". Like people who you can just, say whatever you want …*

Practical help was also valued.

CBF Participant: *… when you're feeling really just tired, can't cope, just having someone to take the baby for even half an hour.*

The CBF group listed one item titled "*support of friends*", and a second titled "*having positive people around you*". Participants believed that exposing themselves to people who were positive and encouraging with regard to their mothering and breastfeeding abilities helped them to cope.

CBF Participant: *It's important to have positive people around you that constantly encourage you.*

Women in the breastfeeding groups also talked of the encouragement and camaraderie shared by breastfeeding women, particularly when breastfeeding in public.

FBF Participant: *People will give you a knowing … and an encouraging sort of smile … I do that to mums* [group agrees] *… even more so in restaurants and stuff like that, like if you sorta … exchange glances.*

Buckner and Matsubara (1993) confirmed the place of friends among the woman's most important resources for the closest personal facets of breastfeeding, including encouraging confidence. Research in this area has tended to focus on the overall level of support perceived by the mother, with some authors finding higher total support scores to be significantly associated with breastfeeding success (Buckner & Matsubara, 1993; Ekström, Widström, & Nissen, 2003), while others found no significant relationship (McNatt & Freston, 1992).

5.7.5 Influence of and Attitude toward Health Professionals

The FBF, CBF and AF groups all raised factors related to the influence of health professionals. The FBF group believed that the health professional's attitude to breastfeeding could influence the mother's behaviour.

FBF Participant: *… it certainly did make it easier that my paediatrician was very pro breastfeeding, and he'd never ever said "I think you need to comp the baby" or anything like that …*

This finding is in line with research conducted in the United States, which found an association between a perceived neutral attitude toward breastfeeding among hospital staff and weaning before 6 weeks (DiGirolamo, Grummer-Strawn, & Fein, 2003). Other research has found that women are much more likely to be breastfeeding at 12 weeks if they report having received encouragement to breastfeed from their clinician (Taveras et al., 2003).

The CBF group titled their factor "*negative comments from health professionals*", and spoke of the confusion and reduction in confidence which can be caused by thoughtless or insensitive remarks when the woman is feeling vulnerable.

CBF Participant: *… on the second* [day] *they came and said … "oh, have you been shown how to breastfeed?" And I said "oh, yes thanks", and she goes, "well you've been shown all wrong" and she … you know … put pillows, and, so then for the next day I just kind of hid feeding her, like, "get me home!".*

> CBF Participant: *… the whole hospital experience was … well if I hadn't of breastfed my first two I wouldn't have done this one because I wouldn't have thought I'd be able to*.

Comments from the AF group support this concern, and demonstrate the need for empathic understanding on the part of health professionals dealing with breastfeeding women.

> AF Participant: *When you've got a midwife snapping at you saying that you're not sitting properly. … You're sort of sitting there thinking, "You know I'm sort of doing the best I can here, you know. I'm giving this a go you know" That whole thing, "Well, I'm trying to do the breastfeeding thing, I'm trying to do the* ***right*** *thing, I'm trying to do everything, but gee it's uncomfortable".*

The AF group discussion suggested that these participants had strong feelings about their dealings with health professionals. Their comments highlight the importance of establishing a relationship of trust and understanding with the mother when aiding with infant feeding. This is supported by research conducted in Victoria, Australia, which showed that women who thought that their antenatal caregivers got to know and remember them were much more likely to rate their care highly than were other women (Davey, Brown, & Bruinsma, 2005). As with this previous study, the current study confirms the importance which women place on quality, personalised interactions with their doctors and midwives.

> AF Participant: *… I didn't feel that anyone … sort of had a look at me, and looked at what the baby was doing properly. … I felt it was a bit impersonal. And it was like there was a breastfeeding manual out there that everyone was following.*

Some AF group members felt that health professionals had "*manipulated*" them into breastfeeding by deliberately underestimating the possibility of problems and dismissing artificial feeding as a possible alternative. This was initially raised as a separate item by the AF group, and later included with this factor.

> AF Participant: *… in retrospect I was totally just, manipulated into thinking that breastfeeding was the way to go … not lying but, omitting a big section of information, so you do sort of feel that you only had the one option, rather than the two.*

Twenty-eight percent of women who sought help with a breastfeeding problem in a recent South Australian study judged that their needs had been met poorly, while only 36% believed their need had been met well (Stamp & Casanova, 2006). However, research conducted in Queensland, Australia (Hegney et al., 2003) suggests a generally high level of satisfaction with the breastfeeding services provided to women. One worrying and related finding from the Hegney et al. study however was that the woman's general practitioner was both a frequently utilised source of breastfeeding advice and the source of professional advice rated as least helpful by mothers.

5.7.6 Feeling Alone and Isolated

The AF group revealed feelings of isolation in their mothering role which they believed were a source of motivation to wean.

> AF Participant: *You've got nothing else to think about all day long, nothing to take your mind off it …* [my husband would] *usually come home to me crying. I'm just crying, the baby crying.*

The authors of one focus group study concluded that breastfeeding leads to an inability to carry out everyday activities and social exclusion (Stewart-Knox, Gardiner, & Wright, 2003), and this is supported by recent Australian research (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005). Participants in the latter Queensland study reported feeling physically isolated as a result of the change in lifestyle brought about by the arrival of the new baby, and isolated from sources of support for breastfeeding specifically.

5.8 Strategies for Success

The group data also included strategies used by group participants, which they believed assisted them in continuing to breastfeed. The identification of these practical strategies suggests that further research may be required to explore these strategies and their effect on breastfeeding duration. Results for the eight strategies for success contained in the data are presented in Table 5.7.

Table 5.7.

Factors Related to the Use of Strategies Believed to Increase Breastfeeding Duration

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Breastfeeding knowledge	A	a	a	A
Problem solving & utilising support	A		a	A
Looking after yourself		a	a	
Cognitive restructuring	x	x		
Mindfulness				a
Psychological preparation for motherhood			a	
Use of positive self-talk		x		

Note. A = selected among the most important factors; a = raised by the group but not selected as among the most important; x = identified as a theme in the group discussions.

5.8.1 Breastfeeding Knowledge

First among these strategies is acquiring breastfeeding knowledge. A sound knowledge of breastfeeding was seen as important to breastfeeding duration by all groups, and voted among the most important by the FBF and HP groups.

> FBF Participant: … *if you do experience difficulties and stuff, then having that prior knowledge can just, get you through those bad times*
>
> HP Participant: *Breastfeeding knowledge is very important when it comes to who's going to succeed*

Research has consistently linked higher levels of breastfeeding knowledge with improved breastfeeding outcomes (Bevan, Mosley, Lobach, & Solimano, 1984; Chezem, Friesen, & Boettcher, 2003; Guise et al., 2003; Kronborg & Vaeth, 2004; Reifsnider & Eckhart, 1997; Rentschler, 1991). One large clinical trial conducted in Brazil (Susin et al., 1999) measured the effect of increasing the breastfeeding knowledge of both mothers and fathers after the birth. Increases in the breastfeeding knowledge of either partner resulted in increased breastfeeding duration in this study, and mothers who scored the highest on breastfeeding knowledge were 1.97 times more likely to be breastfeeding at 6 months than other mothers. However, the timing

of the delivery of breastfeeding information is crucial if it is to be well accepted and utilised.

Typically, breastfeeding information in Australia is offered late in the woman's pregnancy, at a time when the birth is near and many women focus their attention on preparing themselves to give birth. Participants in the current study believed that breastfeeding information should ideally be provided before or early in the pregnancy, before the approaching birth takes all the woman's attention.

> FBF Participant: *They need to get that knowledge in at the beginning, or before the pregnancy. And knowledge about the benefits of breastfeeding and how good it is for the baby, because by the end stage they're just too focussed on the birth and they just can't see past that.*

5.8.2 Problem Solving and Utilising Support

The FBF, AF and HP groups named factors associated with problem solving and the effective utilisation of breastfeeding supports, and the FBF and HP groups selected this among the most important factors influencing breastfeeding duration. When breastfeeding problems occur, some women were observed by the HP group to be more active than others in seeking the information and advice they need to solve the problem.

> HP Participant: *… they get mastitis for the first time and they just, really don't know what to do. But they find out how to fix it ... They actively seek solutions for their own problems or, what's happening in their body.*

Research conducted in regional Queensland, Australia found that 62% of mothers breastfeeding at discharge from hospital asked someone for breastfeeding advice or help during the first 3 months postpartum (Hegney et al., 2003), suggesting that the need for breastfeeding help is common. However, not all women who need breastfeeding help ask for it. A recent South Australian study found that 25% of women with an identified need for breastfeeding assistance did not seek help (Stamp & Casanova, 2006). As confident breastfeeding professionals, it is perhaps not surprising that accessing and utilising help and information was selected by all HP group members as of importance in maintaining breastfeeding.

For the AF group, the decision to seek and utilise advice was moderated by their relationship with the person offering this advice. Advice was better accepted by these women if the adviser was willing and able to listen well, and remained empathic and non-judgemental.

> AF Participant: *Depends on the context it's given sometimes I think. If it comes across as judgemental, you're doing it wrong… but if it's like oh, you know "tell me about it, have you tried ..?", you know, "here's a few things that worked for me, it might work for you", that sort of thing.*

The FBF group item included in this factor was entitled "*accessing support groups*", and focussed on the value of seeking support from groups such as the Australian Breastfeeding Association (ABA). While the ABA's specialist breastfeeding knowledge was highly regarded by FBF group members however, it seemed that for the majority it was the peer support and social opportunities the groups offered that they sought most, especially with a first child.

> FBF Participant: *… all of a sudden I was a mother, and my close colleagues at work, you know, still single, childless sort of thing, and, to me that was just a really good way of meeting other mums, and I guess being encouraged with breastfeeding and stuff like that …*

There is evidence that lay support is effective in promoting exclusive breastfeeding (Sikorski, Renfrew, Pindoria, & Wade, 2003). However, though ABA contact details are often provided to mothers in the postnatal ward, only small numbers of Australian women contact them for support and information (Hegney et al., 2003; Stamp & Casanova, 2006).

5.8.3 Looking After Yourself

The CBF and AF group included "*looking after yourself*" and "*getting enough rest*" as an important strategy for breastfeeding success.

> CBF Participant: *I think you need to have your relax time, otherwise you burn out, you need to have your time out…*
>
> AF Participant: … *everything seems ten times worse when you haven't had enough rest …*

However, there were apparent differences between the participants by group. CBF group members talked of intentionally setting aside time to relax and unwind, while the AF group members discussed feeling unwilling or unable to relax.

> CBF Participant: *… looking after yourself is really important, and you obviously like, intentionally do that when you really need to.*
>
> AF Participant: *… even though I really wanted the rest … it was like, "No, I haven't got time to rest, I've gotta go and … organise dinner, and you know, do the things around the house while she's asleep. So by the end of the day you're that tired, but … I need to keep* ***busy,*** *yeah … standing still isn't an option.*

5.8.4 Cognitive Restructuring

The FBF and CBF group discussions contained evidence of the use of cognitive restructuring by group members. Used in both Rational-Emotive Behaviour Therapy (Ellis, 1993) and Beck's Cognitive Therapy (Beck, 1995), cognitive restructuring is a cognitive coping strategy which involves replacing catastrophic or unhelpful thinking with more helpful thoughts. In this way, some members of the CBF and FBF groups were able to replace anxious, negative thoughts about mothering and infant feeding with more constructive thoughts, thereby perceiving stressors as less threatening and less disruptive. For example, instead of becoming overwhelmed by the daily stressors of mothering, these women viewed the early days of breastfeeding and intensive mothering as a brief stage they were passing through, which would all too soon come to an end. This attitude helped them to place the current challenges in perspective in terms of the future, and the expected course of their lives.

> CBF Participant: *… if you can just appreciate that it's just a different stage of your life and … you're not going to be breastfeeding forever, then maybe you can just pop that mentally aside.*
>
> FBF Participant: *Yeah, yeah and I just think it's just a phase and it will pass quickly and it's so special at the moment … I'm just going to enjoy it.*

When the constant pressures of early motherhood seemed overwhelming, these women also tried to keep the bigger world picture in mind, attempting to place their daily struggles into the framework of the world at large.

CBF Participant: *… I think, the worlds bigger than me … There are bigger things than this …*

5.8.5 Mindfulness

The HP group listed "*mindfulness*" among the factors influencing breastfeeding duration. Mindfulness refers to the cultivation of conscious awareness and attention on a moment-by-moment basis, with an emphasis on seeing and accepting things as they are without trying to change them (Melbourne Academic Mindfulness Interest Group, 2006). The HP group believed that mindfulness helped some women to live in the moment and avoid being overwhelmed by fears for the future or regrets from the past.

HP Participant: *… living in the moment and being mindful of what you're doing … in that moment.*

5.8.6 Psychological Preparation for Motherhood

Members of the AF group believed that they were inadequately prepared for the reality of becoming a mother, given the considerable life and role changes that this entailed.

AF Participant: … [being prepared] *affects even the way you do breastfeed and everything … just to give yourself that time out … time to … realise you are having a baby and what's, what you're going to be doing and all the rest of it.*

The peri-partum period represents one of the greatest risks to the mental health of a woman, and involves major physiological changes at multiple levels in both neural networks and gene expression (Russell, Douglas, & Ingram, 2001). In fact research shows that many women experience adverse changes in mental health following childbirth, regardless of method of infant feeding (Gjerdingen & Chaloner, 1994). Research findings also suggest that the birth of a first child may lead to some immediate disorganisation and change in a woman's perceptions of and satisfaction with her interpersonal relationships (Ruble et al., 1990). Given this evidence the notion of psychological preparation for motherhood holds merit, and may assist women to prepare for the experience of motherhood. This area warrants further investigation.

5.8.7 Use of Positive Self-talk

The use of positive self-talk was noted in the transcribed discussion of women in the CBF group. For some, this strategy may have been used unconsciously.

> CBF Participant: *Like the ladies who have a terminally ill child, you know? There are worse things that could be happening right now* [group agrees]*, than not wanting to do … something, you know. I've got healthy kids, and a partner who's here when I need him.*

While for others, it was a tool more consciously employed to help them through difficult times.

> CBF Participant: *… it might be an hour of feeling like the weight of the world is on your shoulders, but then it's like "OK, I can do this" … and you just* ***do it*** *…*

Self-talk is thought to be effective in helping people confront stressors and to cope with pain and the feeling of being overwhelmed (Lefton, 1994). In psychology, cognitive therapists use self-talk as a technique to challenge unhelpful thoughts (e.g. "I can't do this"), and replace them with more helpful thoughts (e.g., "There's no evidence to suggest I will fail and I'm going to give it my best shot"; WHO, 2000). One other study identified the use of positive self-talk among women who breastfeed despite extraordinary difficulties (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005), supporting the contention that self-talk may represent an important coping strategy for breastfeeding women.

5.9 Non-modifiable Socio-Demographic Factors and Unclassified Items

The remaining items raised were considered non-modifiable socio-demographic factors, or were outside the scope of this study, and therefore unclassified. These items are included here for the sake of completeness, and can be found listed in Table 5.8. Items marked with an asterisk were included in the Phase 2 questionnaire.

Table 5.8.

Non-Modifiable Socio-Demographic and Unclassified Items

Factor raised	**Group**			
	FBF	**CBF**	**AF**	**HP**
Mother's age and/or education*		a	a	a
Mother's health	a	a		
Returning to work*	a		a	
Previous breastfeeding experience*				a
Multiple births*	a			
Parity*		x		
Baby's breastfeeding behaviour	a		A	
Financial cost of formula feeding	a		a	

Note. A = selected among the most important factors; a = raised by the group but not selected as among the most important; x = identified as a theme in the group discussions. *This factor measured in Phase 2.

5.10 Overall Group Comparisons

When the data from each of the four groups were compared overall, several group similarities and differences arose. These group comparisons provide further insights into the characteristics, beliefs and experiences of women belonging to each of these infant feeding groups.

5.10.1 Recruitment

Early group differences became apparent during recruitment for the study. All participants in the FBF group contacted the researcher and expressed interest in participating in the study promptly after hearing of the research, usually through a local newspaper article. This group was easy to populate, and the women were excited at the prospect of sharing their breastfeeding insights, and proud of their breastfeeding achievements. In fact, despite the fact that women meeting the criteria for the FBF group are thought to represent less than 7% of the population of women in the study area (Hegney et al., 2003), this was the first group to have sufficient numbers. The CBF group was the second group formed. The majority of these women also heard of the study through the newspaper report and contacted the researcher within a few days, excited at the prospect of sharing their breastfeeding experience. Women meeting the criteria for both these breastfeeding groups

continued to make contact with the researcher to offer their participation many weeks after the groups had met, all agreeing to be placed on a database should their expertise be needed in the future.

In contrast, women meeting the study criteria for the AF group, who represented over 52% of the mothers of 6 to 12 month old babies in the study area (Hegney et al., 2003), were difficult to recruit into the study. Eventually, breastfeeding professionals in the researcher's network were asked to distribute information on the study directly to women who met the criteria for entry to this group in order to increase participation. Despite this and other efforts to attract women to participate in the AF group, it took many weeks longer to reach the target of seven consenting women before a date for this group could be set.

Researchers have reported difficulties recruiting women from low socio-economic groups into breastfeeding research (Ball, 2003), and this group may be over-represented in the population of women who wean early. However, it is probable that an awareness of the social expectations surrounding infant feeding also contributed to the difficulties experienced in attracting formula feeding mothers to this research. Data subsequently arising from the groups confirmed the social and moral forces surrounding infant feeding in Australia, and suggests that the woman's assessment of her performance will result in feelings of pride or guilt. This may have decreased motivation to participate in studies such as this among artificially feeding women. Therefore, while all of the participants in this research deserve gratitude and acknowledgement for generously giving of their rare and precious time to participate, and for doing so with transparent care and honesty, those women who volunteered to participate in the AF group must also be acknowledged for their courage.

5.10.2 FBF and HP Groups were Similar

The FBF and HP groups specified many of the same factors as most important, and were more similar than other groups. The HP group generated a list of nine factors that they considered the most important influences on breastfeeding duration. Of these nine factors, two (22%) were also on the CBF group list, and three (33%) were included on the AF group list, while seven of the nine factors (78%) were present in both the HP and FBF group lists. These overlapping factors included mothering priorities and maternal self-efficacy; faith in the natural process of

breastfeeding; determination and persistence; belief in the health and other advantages of breastfeeding; breastfeeding knowledge; family culture/mother breastfed; and problem solving and utilising support.

5.10.3 Generalised Positive or Negative Attitudes toward Breastfeeding

The data shows that the groups differed in their feelings about and attitudes toward breastfeeding. For the FBF and CBF women, breastfeeding was most often a pleasant and satisfying experience involving rewarding interaction with the baby, while for some AF participants breastfeeding was boring, frustrating and unpleasant.

> FBF Participant: *… she goes to sleep during the day and I love it. She's lying there* [looks lovingly into empty arms]*, and it's just put her to sleep, it's just relaxed her, and … she'll stay there for a while and just …*
>
> AF Participant*: … over these, you know, hours and hours of sitting there, looking at this* ***thing*** *… sucking on me.*

The AF group participants also believed that breastfeeding restricted their freedom and autonomy, while this was not a feature of the breastfeeding groups' data.

> AF Participant: *I felt that all-consuming breastfeeding thing almost inhibited my, my idea of what motherhood was all about, because I wanted to be going out for lunch. I'd waited, I've been working for 6 years, and not had, you know, been able to go out for lunch during the week.*

This difference in the women's feelings about breastfeeding extended to expressing breastmilk to feed the baby. While acknowledging the inconvenience, the breastfeeding women considered expressing breastmilk as a possible alternative to breastfeeding if it became necessary, while the AF women had more negative experiences and beliefs about expressing.

> CBF Participant: [re the partner wanting to feed the baby] *But you can always express too, and he can give it a bottle if he really wants to.*
>
> AF Participant: *…of course expressing is just an absolute nightmare. I wouldn't even bother.*

5.11 “Most Important” Factors

Table 5.9 contains the factors voted as “most important” by group participants, including the overall ranking, factor name, the groups and number of participants who voted for this factor and the mean rating assigned by the groups. The decision process for arriving at rankings involved assigning priority based on:

1. Number of groups identifying the factor
2. Cumulative percentage of participants selecting this factor in the top seven
3. Combined group rating of the factor

Table 5.9.

Factors Identified as 'Most Important' by the Four Groups Combined (n = 21)

Rank	Factor name	Groups	%	Mean rating
1	Mother's priorities & mothering self-efficacy*	All	52%; *n* = 11	8.84
2	Faith in the natural process of breastfeeding*	FBF AF HP	43%; *n* = 9	8.77
3	Flexibility / Adaptability*	CBF AF HP	38%; *n* = 8	7.97
4	Stress*	FBF CBF AF	33%; *n* = 7	9.20
5	Breastfeeding self-efficacy*	CBF AF	38%; *n* = 8	9.15
6	Determination and persistence	FBF HP	38%; *n* = 8	9.05
7	Early problems	CBF AF	33%; *n* = 7	8.95
8	Support of partner*	FBF AF	33%; *n* = 7	8.60
9	Chosen method is easier / more convenient	FBF CBF	24%; *n* = 5	10.00
10	Belief in the health and other advantages of breastfeeding	FBF HP	24%; *n* = 5	8.80
11	Breastfeeding knowledge	FBF HP	24%; *n* = 5	8.55
12	Feelings of pride and guilt	FBF AF	19%; *n* = 4	9.50
13	Family culture / Mother breastfed	FBF HP	14%; *n* = 3	9.00
14	Problem solving & utilising support	FBF HP	19%; *n* = 4	8.50
15	Baby's breastfeeding behaviour	AF	14%; *n* = 3	10.00
16	Optimism*	CBF	14%; *n* = 3	9.30
17	Feeling needed	CBF	14%; *n* = 3	7.60
18	Selflessness and giving to the baby	FBF	10%; *n* = 2	9.5
17	Social pressure and expectations	AF	10%; *n* = 2	9.5

* These factors were selected for measurement in Phase 2.

5.12 Summary and Practical Implications

Analysis of the data resulted in a list of 52 distinct factors which may influence breastfeeding duration, which were further divided into eight categories. The aim of this research was to identify individual psychological characteristics

which may influence breastfeeding duration, and the 18 factors which met this aim form the first of these categories. The remaining seven categories identified in the data included motivating attitudes; motivating experiences; mothering issues; cultural expectations; other social and support issues; strategies for success and non-modifiable factors.

A relationship between breastfeeding and some of the individual psychological characteristics identified in this study have been postulated in the previous literature. These characteristics include flexibility/adaptability, stress, breastfeeding self-efficacy, determination, breastfeeding expectations, self-esteem, body image, achievement striving, depression, and anxiety. However, with the possible exception of breastfeeding self-efficacy and depression, discussion of these factors has been very limited and few attempts have been made to explore their influence on breastfeeding behaviour further, or to use this information to aid breastfeeding women. The remaining psychological characteristics identified by participants could not be found in the breastfeeding literature, and warrant further investigation to ascertain their relationship with breastfeeding duration. These novel factors include optimism, happiness and the use of humour, psychological reactance, intimacy, resilience, perfectionism, assertiveness and the need for control.

The majority of factors from the remaining categories have been discussed in the literature previously, but several of these are also raised here for the first time. These include mothering self-efficacy/the placement of the baby in the mother's life priorities, which ranked number one as the most important influence on breastfeeding in this study. The strong influence of family, friends and culture on breastfeeding women is also evident in these data, as is the morally-charged nature of infant feeding in Australia today.

Looking at the data overall, seven factors were raised by every group. These were the mother's priorities; faith in the natural process of breastfeeding; flexibility/adaptability; stress; breastfeeding knowledge; misinformation and conflicting advice; and family culture/mother breastfed. Of these seven, four were considered by the participants as the most important factors influencing breastfeeding duration. These were (in ranked order) the mother's priorities and maternal self-efficacy; faith in the natural process of breastfeeding; flexibility/adaptability and stress, none of which have attracted significant research interest to date.

5.12.1 Practical Implications

Research investigating the influence of psychological factors on breastfeeding behaviour is in its infancy, and the insights and perceptions contained within these data provide an important starting point for this work. However, in addition to identifying psychological factors which may influence breastfeeding duration, several strategies to increase breastfeeding duration were raised by participants in this study and these may prove useful to other breastfeeding women. While more research is needed, the current results suggest that breastfeeding clinicians should encourage breastfeeding women to increase their breastfeeding knowledge, actively seek support and information, and allow themselves time out to relax. When times are tough, breastfeeding women may also benefit from the use of cognitive restructuring, and the practice of mindfulness. Encouraging women to become aware of their self-talk, and to replace negative and de-motivating self-talk with more positive and motivating messages may also improve the woman's ability to cope with daily challenges. Strategies for the health system include the possibility of providing pregnant women with psychological preparation for motherhood and breastfeeding. Research is required to develop antenatal programs which may facilitate the woman's transition to motherhood and empower the woman to breastfeed successfully. For the current study, factors raised by the study groups as of influence in the duration of breastfeeding were taken into account when deciding which psychological factors should be measured in Phase 2.

5.13 Psychological Factors for Inclusion in Phase 2

Three sources of information were utilised in deciding the personality and other psychological factors to be investigated in Phase 2. These included the group-generated data, the additional themes arising from their discussions, and the existing research literature. Given the need to collect extensive demographic and feeding data in addition to the psychological factors under consideration, and out of concern for the mother's time in completing the questionnaire, careful consideration was given to the value of each factors selected for measurement. In order to further narrow the choice, personality and psychological characteristics within the mother were given priority over those of a more social nature, which may pose additional problems if modification is the goal.

The top five "most important" factors named by the group were included in the Phase 2 design, including mothering priorities and maternal self-efficacy (measured separately), faith in the natural process of breastfeeding, adaptability, stress, and breastfeeding self-efficacy. Other individual psychological characteristics chosen for measurement included the woman's self-esteem; achievement striving; depression; anxiety; stress; dispositional optimism; psychological reactance; and breastfeeding expectations. A full list of psychological factors chosen for measurement in Phase 2 can be found in Table 5.10. The chapter which follows will present the quantitative method of enquiry utilised during the conduct of Phase 2.

Table 5.10

Psychological Characteristics Chosen for Measurement in Phase 2

Factor	**Group**			
	FBF	**CBF**	**AF**	**HP**
Mother's priorities and mothering self-efficacy (measured separately)	A	A	A	AA
Faith in the natural process of breastfeeding	A	a	A	A
Flexibility / Adaptability	a	A	A	A
Stress	A	A	A	a
Breastfeeding self-efficacy		Aa	A	
Optimism	x	A	x	
Breastfeeding expectations	a		ax	a
Self-esteem		a	a	a
Psychological reactance		aa	xaa	
Achievement striving	a			a
Depression			a	a
Anxiety			x	aa

Note. A = selected among most important factors; a = raised by the group but not selected as amongst the most important; x = identified as a theme in the group discussions.

Though this be madness, yet there be method in't.

William Shakespeare (Hamlet)

Chapter Six: Phase Two Method

6.0 Introduction

This chapter will discuss the participants, measures and procedures used in the conduct of Phase 2 of the study. This quantitative phase of the research was designed to further explore the influence of psychological factors on breastfeeding duration, by measuring these factors after the birth and then contacting participants at 6 months to ascertain their feeding method at that time. This chapter will begin with a description of the study setting and its participants. Following this, the measures used in the study will be described, including a summary of the results of psychometric testing of all previously validated scales. The study procedures will then be outlined, followed by a discussion of the methods of analysis employed.

Method

6.1 Participants

In order to increase the generalisability of the study results, the decision was made to include women who gave birth in both the public and private hospital sectors in the sample. Therefore, participants were sought from among women who gave birth at either St Vincent's Private Hospital Toowoomba, or the Toowoomba Health Service District Hospital (THS). Participants were inpatients between October 4, 2005 and December 26, 2005. These two hospitals provide maternity services to an area including the regional city of Toowoomba in Queensland and the surrounding rural and remote areas, with a population of approximately 238,992 (Queensland Health, 2005). The main referral hospital within the public sector is approximately 128 kilometres east of Toowoomba, in Queensland's capital city of Brisbane. The city of Toowoomba is marked with a dot on Figure 6.1 which follows.

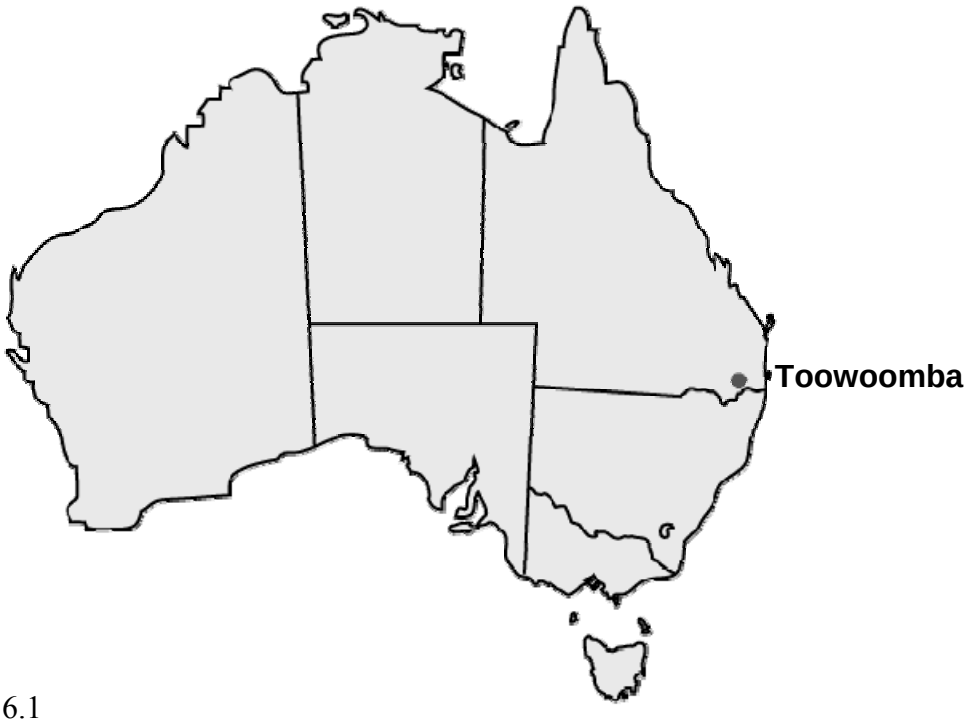

Figure 6.1

Map of Australia Showing the Location of Toowoomba, Queensland

With the two hospital samples combined, eligibility criteria for the study excluded women who were under 18 years old (n = 5); and those with insufficient English language skills to complete the questionnaires (n = 8). Women who were too ill (n = 2), or those whose baby was too ill (n = 5) to participate; and those whose baby had died or been given up for adoption (n = 2) were also excluded. To ensure that all data was collected from women who had recently given birth, a cut-off of 14 days after the birth was imposed for completion of the first questionnaire. Women who completed and returned the initial questionnaire after the 14 day cut-off period therefore failed to meet the eligibility criteria for study participation (n = 4). These and other participation figures are summarised by hospital in Table 6.1.

At St Vincent's Hospital 289 women gave birth during the study period, five of these women were ineligible for participation, leaving an eligible population of 284 women. Of these, 216 completed the initial questionnaire within the 14 day cut-off and returned it to the researcher, giving a private hospital participation rate of 75.7%. Of the remaining births, 58 women who gave birth at St Vincent's Hospital consented to be part of the study but did not return the initial questionnaire, and ten

women (3.5%) were missed by the researcher. One woman later withdrew from the study at her request. These data are summarised in Table 6.1.

At the 6-month interview 12 women from St Vincent's Hospital could not be followed up (*attrition* = 5.6%), five because their telephone had been disconnected and no alternative number had been provided, and seven who could not be contacted after a minimum of five attempts. Data for these women were retained, but censored by the survival analysis procedures.

Table 6.1

Summary of Elements Contributing to Study Participation Rates by Hospital

	THS	St Vincent's
Total births during study period	368	289
Ineligible	21	5
Eligible population	347	284
Returns	159	216
Consented but did not return questionnaire	103	58
Missed by researcher	85	10
Dropped due to missing data	2	-
Withdrew from study	-	1
Participation rate	45.2% (*n* = 157)	75.7% (*n* = 215)

Of the 368 women who gave birth at the THS Hospital during the study period, 21 were ineligible for participation, leaving an eligible population of 347 women. Of these, 159 completed the initial questionnaire within the 14 day cut-off and returned it to the researcher, giving a public hospital participation rate of 45.2%. One hundred and three women who gave birth at THS consented to be part of the study but did not return the initial questionnaire, and 85 women were missed by the researcher (24.5%). Two THS participants were later dropped from the analysis due to missing data. These data are summarised in Table 6.1.

There were a large number of women missed by the researcher at THS (24.5%) when compared to those missed at St Vincent's Hospital (3.5%), leading to a lower participation rate overall. This was largely thought to be due to the differing

length of hospital stay between the public and private hospital systems in Australia. Many women who gave birth at THS were either not inpatients during the five regular morning visits by the researcher (daily except Fridays and Sundays) or were in the labour ward, sleeping, or not ready to be approached at those times.

Fifteen THS participants completed the initial questionnaire but were not successfully followed-up at 6 months (*attrition* = 9.5%). Eight of these women were lost to follow-up because their telephone had been disconnected and no alternative number was provided, and seven could not be contacted after a minimum of five attempts. Data for these women were retained, but later censored by the survival analysis procedures.

With the two hospital samples combined, 657 women gave birth in Toowoomba during the study period, 26 of whom did not meet the study's eligibility criteria, leaving an eligible population of 631 women. Of these women, 375 completed the questionnaire within the 14 day cut-off and returned it the researcher, leaving an overall participation rate for the two hospitals of 59.4% (St Vincent's = 75.7%; THSD = 45.2%).

6.2 Measures

Data for the initial interview were collected using a 123-item self-report questionnaire arranged in three sections. A copy of this questionnaire is attached as Appendix G. The first section contained 15 yes/no, multiple response and Likert scale items designed to cover the demographic and psychosocial information indicated in the literature as being relevant to the analysis. These items were based on those used in previous research (O'Brien & Fallon, 2005). The second section contained six items designed to measure the participant's current feeding method. These items were also based on those used in an earlier study (O'Brien & Fallon), and allowed the accurate classification of infant feeding methods as set out in current guidelines (See Appendix A), in addition to providing data regarding breastfeeding duration for use in the analysis. The final section of the questionnaire contained measures of the woman's psychological characteristics and space for participants to make additional comments regarding their breastfeeding experience if they desired. Decisions on psychological characteristics for inclusion in the questionnaire were based on information gained from Phase 1 and the extant literature, as discussed in Section 5.13. These psychometric scales will now be discussed.

6.2.1 Rosenberg's Self-Esteem Scale

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989) is a 10-item self-report scale which has enjoyed widespread use as a uni-dimensional measure of self-esteem. The scale's ease of administration, scoring and brevity has made it the standard against which new measures are evaluated, and led to its endorsement as a straightforward estimate of positive or negative feelings about the self (Robinson, Shaver, & Wrightsman, 1991). Although originally designed as a Guttman-type scale (Rosenburg, 1986), the RSES is typically scored using a four-point response format (strongly disagree, disagree, agree, strongly agree) resulting in a score range of 0 – 30, where high scores indicate high self-esteem (Heatherton & Wyland, 2003).

One potential problem with the RSES was identified by Carmines and Zeller (1974), who found separate "positive" and "negative" factors resulting from the scale's use, suggesting a response set. However, the two factors were found to be highly correlated in strength, direction and consistency, and seem to be tapping the same general construct (Rosenburg, 1986). Confirmatory factor analyses was conducted by Corwyn (2000) who found that the RSES is a one dimensional construct of global self-esteem based on solid theoretical rationale, but one that tends to be contaminated by a method effect primarily associated with negatively worded items. Utilising three diverse adolescent and adult samples, Corwyn further concluded that this effect diminishes with increased verbal ability, and recommended the scales continued use without alteration.

During its construction, the RSES was associated as expected with several self-esteem related constructs including depressive affect (r = .30) and anxiety (r = .48), in addition to the sociometric ratings of peers (Rosenburg, 1986). Scores on the RSES have been found to be unrelated to constructs such as grade point averages (r = .10), locus of control (r = -.04) or the Scholastic Aptitude Tests (verbal r = -.06, quantitative r = .10), supporting the scale's discriminant validity (Reynolds, 1988).

The RSES is a reliable measure of self-esteem, with a Cronbach's alpha of .88 reported by Fleming and Courtney (1984), and Cronbach's alphas between .84 and .87 attained by Mercer and Ferketich (1990) during their study into parental attachment in early parenthood. Cronbach's alpha with the present sample was .86.

6.2.2 Hong's Psychological Reactance Scale (Refined)

Research utilising the original 14-item Hong's Psychological Reactance Scale (Hong & Page, 1989) consistently showed three problematic items, which led to the development of a refined 11-item scale in 1996 (HPRS-R; Hong & Faedda, 1996). Scale items take the form of positive statements (e.g., "Regulations trigger a sense of resistance in me"), with the respondent asked to rate each statement on a Likert scale ranging from one ("disagree completely') to five ("agree completely"). Scale scores can range from 11 to 55 with high scores indicating high psychological reactance.

Data for the construction of the refined scale was drawn from 3,085 respondents from metropolitan Sydney, and yielded a distinctive four-factor structure explaining 61.2% of the total variance (Hong & Faedda, 1996). These four related factors (r = .21 - .44) were labelled (1) emotional response toward restricted choice; (2) reactance to compliance; (3) resisting influence from others and (4) reactance toward advice and recommendations.

Inspection of the data during scale construction revealed significant associations between the 11-item scale and constructs such as trait anger (r = .38) and depression (r = .15). In addition, analysis revealed that for the total sample, results for the 14-item and 11-item scale were almost perfectly correlated (r = .98), thereby demonstrating convergent validity (Hong & Faedda, 1996). Discriminant validity was demonstrated by the lack of statistical association between scale scores and measures of locus of control and self-esteem (Hong & Faedda, 1996).

Scale reliability was tested by the scale authors and yielded Cronbach's alpha coefficients of .77 and split-half coefficients of .73, with a theta coefficient of .77 (Hong & Faedda, 1996). Test-retest reliability was demonstrated at 2 (r = .89) and 6 (r =.73) weeks. The authors conclude that this is a useful tool for the measurement of psychological reactance (Hong & Page, 1989). Cronbach's alpha using the present sample was .83.

6.2.3 IPIP Adaptability Scale

Adaptability was measured using the eight-item adaptability scale from the International Personality Item Pool (IPIP). IPIP scales can be readily accessed through an internet site (http://ipip.ori.org/ipip/), the intention of which is to provide rapid, public domain access to measures of individual differences. The IPIP internet

site forms the basis of a system whereby scientists may work with each other without regard to geographical location, and without the constraints imposed by copyrighted personality inventories (Goldberg et al., 2006). IPIP scales are well represented in the literature, with numerous researchers reporting their use for diverse research purposes (e.g., Brackett, Mayer, & Warner, 2004; Heaven, Da Silva, Carey, & Holen, 2004).

The broad-bandwidth personality inventories available within the IPIP contain scales developed to directly reflect several existing instruments including the Six Factor Personality Questionnaire (6FPQ; Jackson, Paunonen, & Tremblay, 2000). The eight-item IPIP Adaptability scale corresponds with the lower-level 6FPQ construct labelled "Good natured", which is measured using six items. Scale items take the form of positive statements with a five-point Likert scale response ranging from "very inaccurate" to "very accurate." Five items are reversed before scoring. Scores can range from 8 to 40; with higher scale scores indicating higher adaptability. During construction (Goldberg, 2006), the IPIP Adaptability scale was found to have an inter-item correlation of .20 (6FPQ = .19), and a coefficient alpha of .67 (6FPQ = .58), and correlates with the 6FPQ scale at r = .45 (r = .72 when corrected for attenuation).

In the current sample, the IPIP Adaptability Scale did not reach the recommended minimum Cronbach's alpha of .70 (Tabachnick & Fidell, 2001), leading to doubts about the scale's reliability in the current research. With all eight items included, the initial Cronbach's alpha for the scale was .58. Item seven "I can stand criticism" was revealed by the analysis as problematic when it achieved a low item-total correlation of -.04. Low item-total correlations (less than .3) indicate that the item may be measuring something different from the scale as a whole (Pallant, 2005). Therefore, the decision was made to delete this item, resulting in an improved Cronbach's alpha value of .66. Alpha was further improved following deletion of Item four "I adapt easily to new situations", which also achieved an inadequate inter-item correlation in the shortened scale (.12). Deletion of these two items resulted in a final Cronbach's alpha of .69 for the abbreviated (six-item) scale, still slightly below the recommended .70 cut-off. However, it is common to find low Cronbach values among scales with fewer than 10 items (Pallant), and the scale was retained for analysis.

6.2.4 Life Orientation Test - Revised

Dispositional optimism was measured using the Life Orientation Test - Revised (LOT-R; Scheier, Carver, & Bridges, 1994). The LOT-R consists of three positively worded and three negatively worded items plus four filler items, making a total of 10 items in the scale. Participants are asked to respond to statements such as "In uncertain times, I usually expect the best" using a five-point Likert scale ranging from zero ("strongly disagree") to four ("strongly agree"). Negatively worded items are reverse coded before scoring. Scores can range from 0 – 24, with high scores indicating high dispositional optimism.

A sample of 2,055 undergraduates from the Carnegie Mellon University participated in the research which led to the revision of the original Life Orientation Test (LOT; Scheier, Carver, & Bridges, 1994). The revision of the LOT was the result of concerns by the authors regarding two scale items indicating positive reinterpretation and growth. Given the link between these items and the relatively recent construct of coping, the scale authors decided to remove these items to minimise the overlap in item content with scales measuring optimism or coping, thereby providing more accurate estimates of the correlation between these and other constructs in future research.

The six LOT-R items yielded one factor accounting for 48.1% of the variance, with all items loading at .58 or above (Scheier, Carver, & Bridges, 1994). The correlation between the revised LOT-R and the original LOT was high at $r = .95$ and convergent validity was further demonstrated by significant correlations between scores on the LOT-R and measures of self-mastery ($r = .48$), self-esteem ($r = .50$), anxiety ($r = -.53$) and neuroticism ($r = -.43$).

The scale authors (Scheier, Carver, & Bridges, 1994) report that test-retest reliability was acceptable for administration over four time intervals including 4 months ($r = .69$), 12 months ($r = .60$), 24 months ($r = .56$) and 28 months ($r = .79$). Cronbach's alpha for the six-item scale was .78 in the sample used for scale construction, and .74 in the current sample, suggesting an acceptable level of internal consistency.

6.2.5 Breastfeeding Self-Efficacy Scale – Short Form

The 14-item Breastfeeding Self-Efficacy Scale – Short Form (BSES-SF; Dennis, 2003) was selected as a measure of breastfeeding self-efficacy. Scale items

take the form of positive statements such as “I can always manage to breastfeed, even if my baby is crying”, with respondents being asked to choose an answer ranging between 1 (“not at all confident”) and 5 (“very confident”) on a Likert scale. Item scores are summed to produce a final BSES-SF score, with a possible range between 14 and 70. High scores indicate greater breastfeeding self-efficacy. Permission to use this copy-righted scale was obtained from the author before proceeding.

The BSES-SF is the result of the use of explicit reduction criteria to delete 18 redundant items from the original BSES (Dennis & Faux, 1999). Dennis’ (2003) psychometric assessment of the Short Form revealed a Cronbach’s alpha of .94 with a scale mean of 55.88 (*SD* = 10.85). Cronbach’s alpha for the present sample was similar at α = .95. The mean inter-item correlation during the scale testing was .55, with a range of between .41 and .73. Scores on the BSES-SF were significantly correlated with respective original BSES scores at 1 (*r* = .99), 4 (*r* = .99) and 8 (*r* = .99) weeks postpartum (Dennis, 2003). Following this encouraging reliability analysis of the Short Form, principal components factor analysis was undertaken, which yielded a one-factor solution with an eigenvalue of 8.17 that explained 58% of the variance. A maximum likelihood analysis performed to test the stability of the factor analysis produced comparable results.

In line with self-efficacy theory, Dennis (2003) then conducted a known groups comparison between primiparous mothers and multiparas with previous breastfeeding experience, revealing significant differences in BSES-SF scores at 1 week. Finally, hypothesized relationships between breastfeeding self-efficacy and theoretically related concepts were tested (Dennis, 2003). These relationships were supported at each time period and included positive relationships with self-esteem (*r* = .22 to *r* = .51) and negative relationships with measures of maternal depressed mood (*r* = -.33 to *r* = -.50) and perceived stress (*r* = -.25 to *r* = -.50). These results attest to the construct validity of the BSES-SF, and suggest that it is a very good measure of breastfeeding self-efficacy.

Support for the predictive validity of the BSES-SF was gained by determining the relationship between breastfeeding self-efficacy scores and infant feeding method at 4 and 8 weeks postpartum (Dennis, 2003). Results revealed significant differences in breastfeeding self-efficacy scores at 1 week postpartum for mothers who were breastfeeding, compared to mothers who were artificially feeding

at 4 weeks and 8 weeks postpartum (Dennis, 2003). Further analysis revealed that the higher the BSES-SF score was at 1 week postpartum, the more likely the mother was to be breastfeeding at 4 and 8 weeks postpartum, and to be doing so exclusively.

6.2.6 Achievement Strivings Scale

The participant's achievement related behaviours and attitudes were measured using the Achievement Strivings (AS) scale (Spence, Helmreich, & Pred, 1987). This seven-item self-report scale contains modifications of items found in the student form of the Jenkins Activity Survey (JAS; Jenkins, Rosenman, & Zyzanski, 1971; Krantz, Glass, & Snyder, 1974), and was slightly modified for use with mothers in the current research after gaining permission from the authors (see Table 6.2). All other items and response options remained unchanged (see Phase 2 questionnaire Appendix G).

Table 6.2

*Alterations Made to the AS Scale for the Current Research**

AS scale	Current Study
1. How much does being a college student "stir you into action?"	1. How much does being a mother "stir you into action?"
5. How often do you set deadlines or quotas for yourself in course or other activities?	5. How often do you set deadlines or quotas for yourself to do with your mothering or other activities?
6. Compared with other students, the amount of effort I put forth is:	6. Compared with other mothers, the amount of effort I put forth is:
7. Compared with other students, I approach life in general:	7. Compared with other mothers, I approach life in general:

Note. *Permission to use the AS scale (Spence, Helmreich, & Pred, 1987) incorporating these alterations was granted following private correspondence with Dr Helmreich, September 7, 2005.

Scale items are scored on a five-point Likert scale, with five negatively worded items reversed before scoring. Item scores are summed to produce an overall score with a range between 7 and 35, where high scores indicate high achievement striving.

During construction of the AS scale (Spence, Helmreich, & Pred, 1987), convergent validity was demonstrated by moderate correlations between scores on the AS scale and scores on the Achievement Motives scales of the Work and Family Orientation Questionnaire (for women: mastery $r = .47$; work $r = .43$; competitiveness $r = .25$) , in addition to the students' grade point average ($r = .33$ for women in this sample). Correlations between AS scores and health measures were non-significant.

Cronbach's alphas for the AS scale were reported at $\alpha = .72$ for women during scale construction (Spence, Helmreich, & Pred, 1987), and $\alpha = .83$ for women

in a more recent study involving college students (Robbins, Spence, & Clark, 1991). However, in the present sample the AS scale achieved a disappointing Cronbach's alpha of .66. In particular item 1 "How much does being a mother 'stir you into action'?" achieved a low inter-item correlation of .16, thereby reducing the internal consistency of the scale. Cronbach's alpha rose to $\alpha = .69$ on deletion of this item, still slightly below the recommended level of .70 (Tabachnick & Fidell, 2001).

6.2.7 Depression, Anxiety & Stress Scale – 21 (DASS-21)

The participant's recent experience of depression, anxiety and stress was measured using the short version of the Depression Anxiety and Stress Scale (DASS), known as the DASS-21 (Lovibond & Lovibond, 1995). The essential function of this instrument is to assess the severity of the core symptoms of anxiety, depression and stress. An additional clinical interview is required for diagnosis of these disorders as meeting diagnostic categories such as those in systems such as the DSM and ICD (Lovibond & Lovibond, 1995). The DASS-21 is a set of three intertwined self-report scales containing seven items each, for a total of 21 items. Respondents are asked to rate the frequency or severity of their experiences of each state over the past week on a four-point scale and scores are summed for each scale. Total DASS-21 scale scores can range from 0 to 63. Scores are multiplied by two before reporting to ensure consistent interpretation with the original 42-item version (Lovibond & Lovibond, 1995). High scores indicate more frequent or severe symptoms.

Research has repeatedly shown that both the DASS and the shorter DASS-21 have a clear three-factor structure, and provide a better separation of the features of anxiety and depression than other existing measures (Antony, Bieling, Cox, Enns, & Swinson, 1998; T. A. Brown, Chorpite, Korotitsch, & Barlow, 1997; Crawford & Henry, 2003; Lovibond & Lovibond, 1995; Miller, Pallant, & Negri, 2006), contributing to its popularity in both clinical and research settings. Antony, Bieling, Cox, Enns and Swinson (1998) reported Cronbach's alphas for the DASS-21 of .94 for Depression, .87 for Anxiety, and .91 for Stress in a sample including both clinical and non-clinical participants ($N = 307$). Similarly, a recent Australian study of postnatal women ($N = 325$) reported Cronbach's alphas of .84 for Depression, .77 for Anxiety, and .86 for Stress (Miller, Pallant, & Negri, 2006). Internal consistency in

the current sample was explored for each of the three DASS-21 scales and Cronbach's alphas were .79 for Depression, .74 for Anxiety, and .86 for Stress.

While the distinction between states and traits is not an absolute one, it should also be noted that as the scale items refer to experiences over the past week, the DASS-21 is designed to emphasise states rather than traits (S. H. Lovibond & P. F. Lovibond, 1995). In describing these states, Lovibond and Lovibond (1995, p. 1) report that:

> *... the depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. The Anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient.*

6.2.8 Maternal Self-Efficacy

Maternal self-efficacy was measured using the self-efficacy subscale of the Parenting Sense of Competence Scale (PSOCS; Gibaud-Wallston, 1977), incorporating changes later suggested by Johnston and Mash (1989). The original PSOCS is a 17-item self-report scale answered on a six-point scale ranging from "strongly disagree" to "strongly agree" (Gibaud-Wallston, 1977). Scoring of some items is reversed so that higher scores indicate greater parenting self-esteem. The scale consists of two subscales including a Parenting Satisfaction Scale and a Parenting Efficacy Scale, and includes mother and father versions which differ only in the use of the word "mother" or "father" in item content (Johnston & Mash, 1989). Only the Efficacy subscale was used in the current research, and one item was removed from the original eight-item scale after taking into account the results of factor analyses conducted by Johnston and Mash (1989). Johnston and Mash found that one of the original Efficacy subscale items ("being a good mother/father is a reward in itself") failed to load above .4 on either of the empirically derived factors. The resultant subscale therefore includes seven items with a score range of 7 to 42, with high scores indicating high maternal self-efficacy.

Positive significant relationships between maternal competence and attachment between 1 week and 8 months postpartum (r = .36 to .56) provided some

evidence for construct validity of the seven-item self-efficacy subscale (Mercer & Ferketich, 1994). Further evidence of convergent and divergent validity was provided during testing of the scale by Ohan, Leung and Johnson (2000). Cutrona and Troutman (1986) reported a Cronbach's alpha of .72 for the original eight-item Efficacy subscale in a sample of mothers with infants, and Johnston and Mash (1989) reported improved levels of internal consistency ($\alpha = .76$) when using the modified seven-item version of the scale with the mothers of older children (4 to 9 years of age). PSOCS scores did not vary as a function of child sex or age (Johnston & Mash, 1989). Similarly, Ohan et al. calculated a Cronbach's alpha of .80 for the Efficacy subscale when using the modified seven-item version. In the current sample, the Cronbach's alpha coefficient for the modified PSOCS Efficacy subscale was .85.

6.2.9 Faith in Breastfeeding / Formula

Degree of faith in the natural process of breastfeeding was the second "most important" factor raised by the participants of Phase 1. The Phase 1 data suggested that the breastfeeding women were able to feel more comfortable and relaxed with feeding their infants breastmilk in part because they acknowledged this as the species-specific method of feeding human infants. These women were therefore able to relax and feel sure the baby was getting everything that he or she needed while the baby was being breastfed. In contrast, the Artificially feeding participants were less able to trust their body's ability to sufficiently nourish their infants, and felt more comfortable and relaxed when able to feed their infant a known amount of infant formula.

In an attempt to quantify this previously unmeasured factor, a scale was developed by the researcher which included two items. The first item measured faith in breastfeeding ("If I feed my baby breastmilk, I can relax and be sure he/she is getting everything he/she needs"), and a second item measured faith in formula ("If I feed my baby formula, I can relax and be sure he/she is getting he/she needs"). Participants were asked to respond to these statements on a six-point scale ranging from (1) "strongly disagree" to (6) "strongly agree". Scores on the scale's two items were combined to produce an overall score where high scores indicated greater faith in breastmilk, while low scores indicated greater faith in formula. The method used for calculating scale scores in presented in Table 6.3.

Table 6.3

Calculation of Scores for the Faith in Breastmilk Scale

Score	Label	Raw scores
1	Trusts formula only	Item 1 = 1; item 2 = 6
2	Trusts formula more	Item 1 = 1 to 3; item 2 = 4 to 6.
3	Neutral/Ambivalent	Items 1 and 2 = 1 to 3 (neither easy nor hard); OR items 1 and 2 = 4 to 6 (both easy and hard)
4	Trusts breastmilk more	Item 1 = 4 to 6; item 2 = 1 to 3
5	Trusts breastmilk only	Item 1 = 6; item 2 = 1

As is common with short scales, Cronbach's alpha for this novel scale was low at .49, a result which is to be expected given that the scale contains only two items. Pallant (2005) therefore suggests that it may be more appropriate to report the inter-item correlation when describing the properties of short scales such as this. The recommended optimal inter-item correlation is between .2 and .4 (Briggs & Cheek, 1986). The inter-item correlation for the two items making up the Faith in Breastmilk scale was .33, suggesting a satisfactory level of correlation between these two items.

6.2.10 Breastfeeding Expectations

In line with some previously reported research (e.g., Binns & Scott, 2002; Hoddinott & Pill, 1999), three of the four Phase 1 groups believed that the woman's expectations of how difficult breastfeeding would be may influence her breastfeeding outcomes. Two items were therefore included in the questionnaire which formed a brief scale designed to measure the participant's expectations of breastfeeding. The items were designed by the researcher, and represented opposing views of the level of expected difficulty with breastfeeding (item one: "I don't expect to experience any real trouble with breastfeeding, I think it will be easy for me" and item two: "I expect I will have to work through significant challenges if I am to breastfeed successfully, I think it will be hard for me."). Participants were asked to respond to the items on a six-point scale ranging from (1) "strongly

disagree" to (6) "strongly agree." Responses to the two items were combined to form a single score for Breastfeeding Expectations using the method outlined in Table 6.4. High scores on the Breastfeeding Expectations measure represent more expected difficulty with breastfeeding.

Table 6.4

Calculation of Scores for Breastfeeding Expectations

Score	Label	Raw scores
1	Strongly believes breastfeeding will be easy	Item 1 = 6; item 2 = 1
2	Expects breastfeeding to be easy	Item 1 = 4 to 6; item 2 = 1 to 3.
3	Ambivalent	Items 1 and 2 = 1 to 3 (neither easy nor hard); OR items 1 and 2 = 4 to 6 (both easy and hard)
4	Expects breastfeeding to be hard	Item 1 = 1 to 3; item 2 = 4 to 6
5	Strongly believes breastfeeding will be hard	Item 1 = 1; item 2 = 6

As with the Faith in Breastmilk scale discussed previously, the small number of items utilised in creating this scale contributed to a lower Cronbach's alpha coefficient than is generally accepted, at $\alpha = .66$. The inter-item correlation for the two items making up this brief scale was .50.

6.2.11 Maternal Priorities

The placement of the new baby in the mother's life priorities was a major part of the factor considered "most important" when data from all four Phase 1 groups was combined (this Phase 1 factor also incorporated maternal self-efficacy, measured separately). Women in the breastfeeding groups believed that it was important for the mother to consider the new baby her first priority, and this baby-centred focus seemed to help them to cope with the challenges of early mothering.

In an attempt to quantify the relative placement of the new baby in the mother's priorities, participants were asked to rate nine potentially competing responsibilities on a scale of 1 to 10, with 1 being the lowest priority and 10 being

the highest (e.g., this baby; husband/partner; other children; paid work; time for myself). The scale also included an "other" category. Participants were permitted to assign two or more items the same rating if desired. A single dichotomous variable was then created for analysis which identified participants who had assigned this baby on a higher priority rating than any other (1), and those who had assigned one or more competing priorities at the same or higher priority rating compared with this baby (2).

6.2.12 Follow-up Questionnaire

At 6 month follow-up mothers were asked about their feeding method at that time, and the time of introduction of supplemental foods or the cessation of breastfeeding if appropriate. Specific questions regarding the timing of the introduction of solid foods were also included. The two to five item questionnaire (dependent on group membership) administered by telephone at follow-up interviews is attached as Appendix H.

6.3 Procedure

Before beginning the project, ethical approval was gained from the Human Research and Ethics Committees (HREC) at the University of Southern Queensland (Reference number H05STU498), the Toowoomba Health Service District (Reference number 2005/031) and St Vincent's Private Hospital, Toowoomba (Sisters of Charity and Holy Spirit Health Service Queensland HREC, 21 October, 2005). The questionnaire was piloted on a small group of mothers (n = 3) and subject-matter experts (n = 8), and changes were made as required before proceeding. To ensure sufficient power for the analyses (Tabachnick & Fidell, 2001), the recruitment period was scheduled to end when a minimum of 500 women had consented to participate in the study.

At St Vincent's Private Hospital, eligible individuals were first approached by the researcher during their postnatal hospital stay and asked to participate in the research, while at the Toowoomba Health Service, this approach was made after first being introduced to the patient by a member of the maternity ward nursing staff. The rationale for the study was briefly explained by the researcher, along with the extent of participant involvement and the research procedure. Women were advised that participation was voluntary and that they could refuse to participate, or if participating could withdraw from the study at any time. A plain language statement

and consent form (Appendix I) was then provided, and the consent portion completed by the participant. At this time, the participant was also assigned a unique identifying number that enabled linking of responses at follow-up, while at the same time safeguarding the participant's confidentiality.

Participants were left with the coded self-report questionnaire, a copy of the plain language statement including contact details for the research team, and a postage paid envelope. The participant was asked to place the completed questionnaire in the envelope provided and to post it into a locked box located near the nurse's station, or return it through the postal system when complete. The researcher removed the questionnaires from the ward at least five times a week during this phase. Questionnaires were then scanned to retrieve data using the Teleform (Cardiff, 2005) system, and locked in a filing cabinet in a locked office at the Centre for Rural and Remote Area Health. All response data were filed separately to any information which may identify participants.

Following completion of the initial questionnaire, the mother was telephoned for follow-up when her baby turned 6 months old. Participants were considered lost to follow-up if the telephone number supplied was disconnected and no alternative contact details were available, or if the researcher was unable to contact them after a minimum of five attempts. The participant's involvement in the study ended at the completion of the follow-up interview, and the provision of support and information was no longer seen as a threat to the validity of the study. Mothers indicating a need for breastfeeding information or assistance at this time (approximately 20%) were therefore assisted with these issues as necessary, and provided with appropriate information and referrals as required. Participants were invited to view the results of the study on its completion by accessing an assigned page through the Centre for Rural and Remote Area Health website (http://www.usq.edu.au/crrah/default.htm), or by requesting that a printed summary be provided through the postal system.

6.3.1 Statistical Analyses

The primary goal of the statistical analysis was to assess the relationship between the time of cessation of breastfeeding and a set of predictors, to determine whether the psychological factors under investigation made a unique contribution to the prediction after statistically controlling for the other variables. In order to test this relationship Spearman's rho correlations (for continuous variables), and Wilcoxon

(Gehan) statistics (for categorical variables) were employed to test the bivariate relationship between each survey variable of interest, and the duration of Fully breastfeeding and Any breastfeeding. Variables found to be significantly related to breastfeeding duration in these analyses at $p < .05$ were entered into a sequential Cox regression equation in two steps, with all significantly related socio-demographic variables being entered at Step 1, and significantly related psychological variables being entered at Step 2.

Cox regression and survival analysis are part of the family of techniques which deal with the time it takes for something to happen, in this case, cessation of either Fully or Any breastfeeding. Survival analysis allows for cases whose time of cessation of breastfeeding is not known at the end of the study (either because they are lost to follow-up, or are still breastfeeding). Cases such as these are referred to as censored. Cox regression models the rate of cessation of breastfeeding as a log-linear survival function of predictors, called covariates, and allows for sequential entering of these covariates (Tabachnick & Fidell, 2001). The method is non-parametric and accepts the inclusion of continuous, dichotomous or categorical data. Regression coefficients give the relative effect of each covariate to the survival rate as a function of time, or survivor function (Tabachnick & Fidell). R^2 statistics can also be produced, and here provide a measure of the strength of association between the covariates and cessation of Fully breastfeeding in the first regression conducted, and the covariates and the cessation of Any breastfeeding in the second regression conducted. Additional written information regarding the woman's breastfeeding experience was provided by 11.5% ($n = 43$) of participants, and these data were analysed using thematic analysis.

6.4 Conclusion

This chapter has outlined the methods used in Phase 2, including the study participants, measures and procedures. The study took place in the regional city of Toowoomba in Queensland, Australia. Data were collected between October and December, 2005, when 375 of 657 eligible women giving birth at either of two participating hospitals (59.4%) completed and returned the initial questionnaire. The questionnaire contained measures of socio-demographic and infant feeding variables, in addition to novel ($n = 3$) and pre-validated ($n = 10$) scales designed to measure the psychological factors identified in Phase 1 of the study. Participants were telephoned

at 6 months to complete a follow-up instrument measuring the woman's infant feeding method at this time. The data analysis which followed used a mixture of techniques including survival analysis and Cox regression to explore the relationships between breastfeeding duration and variables in the design. The chapter which follows will present the results of this analysis.

Sit down before fact as a little child, be prepared to give up every preconceived notion, follow humbly wherever or whatever abysses nature leads, or you will learn nothing.

Thomas H. Huxley

Chapter Seven: Phase Two Results

7.0 Introduction

This chapter will present the results of the analysis of the Phase 2 study. The discussion begins with a summary of the incidence and treatment of missing data in the data set, before outlining issues relevant to the coding of variables used in the analysis. Variable distributions are then discussed. The characteristics of study participants are then presented, including measures of the socio-demographic, infant feeding method and psychological factors included in the study. Following this preliminary information, the results of Spearman's rho correlations and Wilcoxon (Gehan) statistics used to measure the association between the study variables and breastfeeding duration are presented. The assumptions of Cox regression and the results of the Cox regressions for Full and Any breastfeeding are then provided. Finally, the additional qualitative comments made by study participants will be discussed.

Results

All statistical analyses for the study were performed using the Statistical Package for the Social Sciences (SPSS) Version 14.0 for Windows (SPSS, 2005). Prior to analysis, the data were inspected for accuracy of entry, missing values, and the fit between their distributions and the assumptions of the various analyses to be undertaken. Descriptive statistics including means and score ranges for continuous variables, and proportions in the case of categorical variables, were generated to fully describe the characteristics of this sample, and to allow comparison with samples employed in previous and future research. All analyses were performed twice, first using data measuring the duration of Fully breastfeeding, and second using data measuring the duration of Any breastfeeding. This method allowed the identification of any differences between factors influencing these two distinct breastfeeding methods (Appendix A).

7.1 Missing Data

Following careful data screening, the analysis began with an inspection of missing data. Thirty-six items were found to have a small number (less than 5%) of missing data points, which appeared random in nature. Tabachnick and Fidell (2001) contend that where less than 5% of data is randomly missing from a large data set, almost any procedure for handling the missing values yields similar results. Twenty of these missing items represented one item from a larger, pre-validated, single-factor scale, and these items were replaced with the mean score for that case, based on the remaining items. Consideration of the remaining 16 variables which contained less than 5% of randomly missing data led to replacement with the sample mean for that variable in ten cases, and replacement with the sample median for that variable in five cases, where this was deemed more appropriate. One missing value could not be logically estimated and was left blank, and one participant who was responsible for numerous missing data points was dropped from the analysis.

Few variables were missing more than 5% of data. Exceptions were 37 women (9.8% of the sample) who missed Question 11.2 "*If I feed my baby formula, I can relax and be sure he/she is getting everything he/she needs"*, and 21 women (5.6% of the sample) who missed Question 12.2 "*I expect I will have to work through significant challenges if I am to breastfeed successfully, I think it will be hard for me"*. In both cases, the question was immediately preceded by a similar question which was couched in opposite terms (i.e., Q11.1 "*If I feed my baby breastmilk, I can relax and be sure he/she is getting everything he/she needs* and Q12.1 *I don't expect to experience any real trouble with breastfeeding, I think it will be easy for me")*. It is possible that this format confused some women into believing that they were required to answer one of the questions in the set only. Missing data on these variables was replaced with the mean for that case's current feeding method.

The BSES-SF contained the largest amount of missing data when compared to the other scales in the questionnaire. All BSES-SF items contained some missing data, up to a maximum of 5.6% of data for that item. These missing data are summarised in Table 7.1. As the large majority (90%) of data missing from this scale was missing from questionnaires completed by Artificially feeding women, this suggests a tendency for this group of women to avoid completing the scale. As scale

items are related directly to the woman's breastfeeding experience, it is possible that Artificially feeding women believe that this scale is not relevant to their current feeding method, and therefore need not be answered. It is also possible that answering these breastfeeding questions is an uncomfortable or unpleasant experience for Artificially feeding women, particularly in the post-partum period when the pressure to breastfeed is at its highest.

Table 7.1
Missing Data on the BSES-SF

	Missing items	%
Question 7.1	13	3.5%
Question 7.2	15	4%
Question 7.3	19	5.1%
Questions 7.4 to 7.14	21	5.6%

Preliminary analyses revealed a significant difference in BSES-SF scores as a function of feeding method, where the mean score for Artificially feeding women (x = 25.9) was significantly different to the group mean for Fully breastfeeding women (x = 43.7, t = 7.26, df = 28, p = .000). Data for the 21 participants (5.6% of the sample) who did not answer enough questions on the scale to estimate scale scores were therefore replaced with the mean for their infant feeding group. BSES-SF data missing from other cases (n = 10) was less than 5% and apparently random in nature. Nine of these cases were missing only one data point, and the remaining case was missing two data points. These data points were replaced with the mean score for that case, based on the remaining items. With missing data resolved, the analysis progressed to the coding of variables for analysis.

7.2 Variable Coding

Several of the categorical variables were dichotomised for the analysis due to small numbers in some cells, to increase the power of the Cox regressions, and/or to simplify the interpretation of results. These included the mother's intention to return

to full time or part time paid work. These two variables were collapsed from the original six categories (see Appendix G) to two categories (1 = no plans to return to full time/part time work in the next 12 months or at all; 2 = plans to return to work within 12 months). Time of infant feeding decision was dichotomised from the original four categories to indicate decisions made before this pregnancy or after this pregnancy. The partner's infant feeding preferences was dichotomised from the original seven point Likert scale to indicate either a preference for breastfeeding, or ambivalence toward feeding method/preference for artificial feeding. The latter category also included single women.

The occupations of both the mother and her partner (if applicable) were initially classified according to the Australian Standard Classification of Occupations (ASCO; Australian Bureau of Statistics, 2001b). ASCO was produced by the Australian Bureau of Statistics and the Department of Employment, Education and Training for use in the collection, publication and analysis of statistics, and is widely used in both the public and private sectors (Australian Bureau of Statistics). Given that the aim was to gain some insight into the participant's socio-economic status, these variables were collapsed to indicate occupations including (1) ASCO categories 2 and 3, being: professionals and associate professionals; and (2) all other employment categories including managers and administrators, tradespeople; advanced clerical and service workers; intermediate clerical, sales and service workers; production and transport workers; elementary clerical, sales and service workers; labourers; and those without paid employment.

Additionally, the mother's previous breastfeeding experience was initially surveyed by asking the multiparous participants to specify the length of time for which they had breastfed all previous children. This information was utilised in the construction of a dichotomous variable which indicated that the mother had (1) previously breastfed at least one baby for 6 weeks or more; or (2) never breastfed one child for as much as 6 weeks. It was hypothesized that women who continued to breastfeed beyond 6 weeks would be more likely to have successfully negotiated common early breastfeeding issues such as attachment, positioning, and the establishment and maintenance of an adequate milk supply (Brodribb, 2006). Therefore, these women may feel more benefit from their previous breastfeeding experience than those who had weaned before this.

Responses to the single-item six-point scale measuring the woman's faith in breastmilk, and the associated single-item six-point scale measuring her faith in artificial feeding were utilised in the construction of a continuous variable whose values indicate: (1) trusts formula only; (2) trusts formula more than breastmilk; (3) neutral/ambivalent; (4) trusts breastmilk more than formula; and (5) trusts breastmilk only. This summary measure places absolute faith in breastmilk at one end of the scale, and absolute faith in artificial feeding at the other. Similarly, the two variables indicating the woman's expectation that breastfeeding would be "easy" or "hard" were utilised in the construction of a continuous variable whose values indicate (1) strongly believes breastfeeding will be easy; (2) breastfeeding will be easy; (3) neutral/ambivalent; (4) breastfeeding will be hard; (5) strongly believes breastfeeding will be hard. Additional information on these scales in available in Section 6.2.10.

Other alterations to the variables included the doubling of DASS-21 scores prior to analysis. This is recommended by the scale authors in order to facilitate comparison of the sample results with other research which may have utilised the full 42-item scale (Lovibond & Lovibond, 1995).

Two variables were considered too homogenous in this sample to be utilised as variables predicting breastfeeding duration and were dropped from the analysis. These included marital status (92% married or de facto) and multiple birth (.02% positive responses, $n = 6$). The distributions of the remaining, coded variables were then inspected for normality.

7.3 Univariate and Bivariate Distributions

While multivariate normality is not necessary to meet the assumptions of Cox regression survival analysis, Tabachnick and Fidell (2001) contend that achieving it often results in higher power and better prediction. Given this, it was decided that the data should be screened for multivariate normality after testing for univariate normality and then producing bivariate scatterplots of continuous variables.

Using a cut-off of $z = 3.29$, $p < .001$, no outliers were detected in the univariate distributions, with the exception of the woman's planned breastfeeding duration and the three DASS sub-scales, discussed below. No signs of skewness or kurtosis were found in the univariate distributions of mother's age; mother's education; Rosenberg's Self-Esteem Scale, Hong's Psychological Reactance Scale,

the IPIP Adaptability Scale, the Life Orientation Test-Revised; Breastfeeding Self-Efficacy Scale-Short Form or the Achievement Striving Scale. However, scores on the Parenting Sense of Competence Scale were significantly negatively skewed (z = -6.04, p <.001), while showing no evidence of kurtosis (z = -3.15). In line with the advice of Tabachnick and Fidell (2001), transformation of these variables was attempted. Scores on this variable were subjected to several alternative transformations (including reflect and square root and reflect and logarithm) without achieving normality. As normality could not be achieved, this variable was dichotomised to separate low from moderate/high scores on this six-point scale. A cut-off score of 21 and below was selected for low scores, indicating a mean score of three or less for each item on the scale, and therefore the participant's generalised disagreement with the positive statements on mothering self-efficacy contained within the scale (i.e., agree versus disagree).

The three DASS-21 sub-scales were significantly positively skewed (Depression z = 18.33, Anxiety z = 10.88, Stress z = 8.43, Total z = 12.03, p = .001) and displayed significant positive kurtosis (Depression z = 28.09, Anxiety z = 5.64, Stress z = 4.74, Total z = 10.85, p = .001). Scores on the Stress sub-scale were subjected to a square root transformation, which normalised this distribution (SQRT Stress *skew* = 2.06, *kurtosis* = -1.02). However, scores on the Depression and Anxiety sub-scales remained significantly skewed after square root transformation, and were subsequently subjected to a logarithmic transformation which normalised these distributions (Log Depression *skew* = 2.53, *kurtosis* = -2.71; Log Anxiety *skew* = -0.15, *kurtosis* = -2.89). Using a cut-off score of >3.29 (p < .001), no outliers were detected in the transformed univariate distributions. Further analysis revealed that the bivariate distributions of these transformed scores with many of the remaining variables in the design remained widely scattered. However, while the overall shape of many scatterplots was not oval, no curvilinear relationships were present, and the decision was made to proceed with the multivariate analysis using both the transformed and untransformed scores. Results of these analyses were then compared, and the original scores retained as meaningful differences did not exist (Tabachnick & Fidell, 2001).

Participants were asked to indicate their planned duration of breastfeeding in weeks. Where the mother had provided a time-range in which she would like to wean (e.g., 6 to 12 months), the longest time period provided was entered into the

analysis, to indicate the maximum amount of time the woman planned to breastfeed. Some mothers (n = 18) did not specify a time, but made qualitative comments such as "*Until baby chooses to wean*" "*No time restraints*" or "*As long as I can*". Given that the upper range of the current recommended duration of breastfeeding in Australia is 2 years (NHMRC, 2003), these mothers were coded at 104 weeks. There was a wide range of planned duration, from 1 week or less to 208 weeks (x = 52.46; SD = 28.18). The distribution of planned duration scores was positively skewed (*skew* = 8.57) and kurtotic (*kurtosis* = 10.86), and several scores at both ends of the distribution were statistical outliers, leading to a decision to collapse this continuous variable into two categories, indicating a planned duration of 6 months or less, or more than 6 months.

Bivariate scatterplots were produced for each pair of dependent variables, confirming the existence of linear relationships between the majority of variable pairs. However, in addition to the DASS-21 subscale scores discussed above, there were three further exceptions. These exceptions included Achievement Striving and Optimism (LOT-R), which showed points clustered in a circular pattern at the high end of the distribution, and the mother's education with both breastfeeding self-efficacy and adaptability, whose plots also revealed little suggestion of a linear relationship between these variables. However, no curvilinear relationships were suggested by the scatterplots which may threaten the accuracy of the results, and the decision was made to retain these variables in their present form. Inspection of the scatterplots also revealed that all bivariate distributions were sufficiently homoscedastic.

As only those variables found to be significantly related to breastfeeding duration were to be entered into the multivariate analysis, checks for multivariate outliers and multicollinearity were deferred until the multivariate data set was decided. These issues are discussed in Section 7.8.1. Descriptive statistics for the socio-demographic, infant feeding and psychological characteristics of the participants then became the focus of the analysis.

7.4 Participant Socio-Demographics

At the time of the first interview, the average age of participant's babies was 3.5 days, with a range of 0 to 14 days. The sample as a whole contained roughly equal numbers of mothers from Toowoomba and surrounding small rural areas.

Almost all the participants (92%) were married or in defacto relationships. The typical participant had no plans to return to full or part time work at the time of first interview, had made her infant feeding decision before she became pregnant, and planned to breastfeed for between 6 and 12 months. Most participants had already had at least one live baby; were an average of 30 years of age; and had around 13.6 years of formal education (including school, college and university training and/or apprenticeships). The usual occupations of participating women were spread relatively evenly over the classifications, but almost a quarter usually held professional or associate professional positions, while a further 25.5% usually held no paid employment. The partners of 28% of the participants held positions in professional or associate professional occupations. These data are summarised in Table 7.2 and 7.3.

Table 7.2

Descriptive Statistics for Categorical Variables Describing the Demographic Characteristics of the Sample

Covariate		Frequency	Valid %
Hospital where birth occurred			
	Public hospital	157	42.2%
	Private hospital	215	57.8%
Parity			
	Primiparous	144	38.7%
	Multiparous	228	61.3%
Previous breastfeeding experience			
	< 6 weeks experience	189	50.8%
	Breastfed ≥ 6 weeks	183	49.2%
Choice of feeding method			
	Breastfeeding	327	87.9%
	Artificial feeding	28	7.5%
	Some of each	17	4.6%
Rural or regional dwelling			
	Regional – 4350 postcode	175	47%
	Rural - other	197	53%

Table 7.2 (cont)

Covariate		Frequency	Valid %
Marital Status			
	Married/defacto	342	91.9%
	Single/not living with partner	30	8.1%
Partner's preference			
	Prefers breastfeeding	266	71.5%
	Ambivalent/prefers formula	106	28.5%
Planned return to full time work			
	No plans for full time <12 mth	326	87.6%
	Return full time before 12 mth	46	12.4%
Planned return to part time work			
	No plans for part time < 12 mth	235	63.2%
	Return part time before 12 mth	137	38.6%
Mother's usual occupation*			
	Professional/Associate professional	88	23.7%
	All other occupation categories	284	76.3%
Farther's usual occupation*			
	Professional/Ass professional	104	28%
	All other occupation categories	268	72%

Note. $N = 372$; *Occupations classified according to the Australian Standard Classification of Occupations (Australian Bureau of Statistics, 2001b)

Table 7.3

Descriptive Statistics for Continuous Variables Describing the Demographic Characteristics of the Sample

Covariate	*M*	*SD*	Range
Mother's age	30	5.47	18-45
Mother's years of education	13.6	2.69	9-22

Note. $N = 372$.

7.5 Breastfeeding Rates

Breastfeeding rates for the sample at interview one and at 6 months postpartum were then analysed. At the time of the first interview, the infant feeding methods of the participants (N = 372) were classified as follows (Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003): 82.8% (n = 308) reported that they were Fully breastfeeding; 7.8% (n = 29) were Complementary breastfeeding; and 9.4% (n = 35) were Artificially feeding. Of the 346 women who remained in the study at 26 weeks, 10.1% (n = 35) were Fully breastfeeding, 44.2% (n = 153) were Complementary breastfeeding, and 45.7% (n = 158) were Artificially feeding (for definitions see Appendix A). These data are summarised in Table 7.4.

Table 7.4

Breastfeeding Rates in the Current Sample

Feeding Method	Interview One	6 Months
Fully Breastfeeding	82.8% (n = 308)	10.1% (n = 35)
Complementary Breastfeeding	7.8% (n = 29)	44.2% (n = 153)
Artificially Feeding	9.4% (n = 35)	45.7% (n = 158)

Note. Interview One N = 372; 6 months N = 346.

At each interview, participants who had introduced formula or changed from partial to full formula feeding were asked to specify the age of the baby at which formula was first introduced (cessation of Full breastfeeding), and/or the age of the baby when all breastfeeding stopped (cessation of Any breastfeeding). These data enabled the construction of variables specifying the duration of Fully and Any breastfeeding in weeks or part weeks for the purposes of survival analysis.

7.6 Psychological Variables

To facilitate comparison of the psychological characteristics of the current sample with results reported in previous research, statistics describing the sample's results on previously validated psychometric scales are presented in Table 7.5

Table 7.5

Descriptive Statistics for Psychometric Scales Completed by Participants

Covariate	*M*	*SD*	Range
Rosenberg's Self-Esteem Scale	23.41	4.34	9-30
Hong's Psychological Reactance Scale	29.22	6.25	11-46
IPIP Adaptability Scale*	21.15	3.62	11-30
LOT-R	15.18	3.66	4-24
BSES-SF	47.88	12.24	16-70
AS Scale‡	20.28	3.44	9-30
DASS-21 Depression†	4.47	5.51	0-34
DASS-21 Anxiety†	6.72	6.54	0-30
DASS-21 Stress†	11.30	8.40	0-42
PSOCS Maternal Self-Efficacy	31.53	5.82	10-42

Note. *2 items removed to improve reliability. ‡1 item removed to improve reliability. †DASS-21 scores have been doubled to allow comparison with full DASS scale scores. N = 372.

To further facilitate comparisons with other studies, the DASS-21 sub-scale scores were also collapsed into the five categories commonly associated with DASS results (Lovibond & Lovibond, 1995). These categories represent the scale author's guidelines for rating the severity of symptoms based on the normative sample. Scores on each of the three scales were categorised as normal, mild, moderate, severe or very severe, according to the cut-offs for each scale provided by the scale authors, and are presented in Table 7.6 (Lovibond & Lovibond, 1995).

Table 7.6

DASS-21 Sub-Scale Scores Categorised by Symptom Severity

Scale and category	Frequency	Valid %
Depression		
Normal	316	84.9%
Mild	35	9.4%
Moderate	12	3.2%
Severe	4	1.1%
Extremely severe	5	1.3%
Anxiety		
Normal	246	66.1%
Mild	30	8.1%
Moderate	49	13.2%
Severe	19	5.1%
Extremely severe	28	7.5%
Stress		
Normal	276	74.2%
Mild	34	9.1%
Moderate	35	9.4%
Severe	19	5.1%
Extremely severe	8	2.2%

Note. N = 372

Other scales and items measuring the psychological characteristics of the sample are presented in Table 7.7. The time of the mother's infant feeding decision represents a single item on the questionnaire, while frequencies listed here for the mother's priorities, faith in breastmilk and breastfeeding expectations represent a summary statistic based on the participant's responses to between two and ten items designed by the researcher to measure these constructs.

Table 7.7

Descriptive Statistics for Other Psychological Variables in the Design

Covariate		Frequency	Valid %
Time of feeding decision			
	Before pregnancy	261	70.2%
	After pregnancy	26	17.7%
Planned duration of breastfeeding			
	6 months or less	118	31.7%
	> 6 months	254	68.3%
Mother's priorities			
	Baby uniquely first priority	113	30.4%
	Other priorities equal or higher	259	69.6%
Faith in breastmilk			
	Trusts BF only	35	9.4%
	Trusts BF more than formula	86	23.1%
	Neutral or ambivalent	216	58.1%
	Trusts formula more	17	4.6%
	Trusts formula only	18	4.8%
Breastfeeding expectations			
	Strongly believes BF easy	32	8.6%
	Believes BF easy	99	26.6%
	Neutral or ambivalent	120	32.3%
	Believes BF hard	99	26.6%
	Strongly believes BF hard	22	5.9%

Note. $N = 372$

7.7 Association between the Survey Variables and Breastfeeding Duration

The next step in the analysis was to make decisions regarding which of the predictor variables to enter as covariates into the Cox Regressions, and to test the hypothesis that psychological variables would significantly predict breastfeeding duration. To achieve this, the relationship between each variable and the duration of Fully Breastfeeding, and then the duration of Any Breastfeeding, was explored.

Survival analysis in the form of actuarial life tables was employed to test this relationship for categorical variables, and Spearman's rho correlations were utilised for the continuous variables considered. Only those covariates significantly related to the breastfeeding duration variables were retained for the Cox regressions, with an alpha level of .05 being utilized as the criterion of significance.

Table 7.8 shows the results of the Spearman's rho correlations between the continuous variables and breastfeeding duration. The duration of both Full and Any Breastfeeding was significantly associated with continuous measures of the mother's age, education, optimism, breastfeeding self-efficacy, faith in breastmilk, breastfeeding expectations and anxiety in this sample.

Table 7.8

Spearman's Rho Correlations between the Continuous Covariates and Breastfeeding Duration

	Full Breastfeeding	Any Breastfeeding
Covariate	r_s	r_s
Mother's age	.202***	.200***
Mother's education	.192***	.240***
Self-esteem	.090	.082
Psychological reactance	.011	-.008
Adaptability	-.084	.007
Optimism	.118*	.178**
Breastfeeding self-efficacy	.478***	.455***
Achievement striving	.029	.005
Faith in breastmilk	.491***	.394***
Expectations	-.363***	-.300***
Depression[†]	-.082	-.098
Anxiety[†]	-.116*	-.155**
Stress[†]	-.020	-.071

Note. * $p < .05$; ** $p < .01$; ***<.001. Fully breastfeeding, $n = 346$; Any breastfeeding, $n = 332$. [†]Results were identical for transformed and non-transformed variables for all DASS subscales.

Table 7.9 contains the Wilcoxon (Gehan) statistics from actuarial life tables constructed in order to test the association between each categorical variable and the

cessation of Fully or Any breastfeeding. The Wilcoxon (Gehan) statistic is a measure of differences among groups, using weighting based on the time that groups begin to diverge during the course of survival (Tabachnick & Fidell, 2001). A significant result indicates a statistically significant association between time of breastfeeding cessation and group membership. Such an association was found between the following variables and the duration of both Fully and Any breastfeeding ($\alpha = .05$): mother's occupation; time of infant feeding decision; the planned duration of breastfeeding; and the feeding preference of the mother's partner. Life tables depicting the effect of group membership on Fully and Any breastfeeding duration for all significant categorical covariates entered into the analysis are provided in Appendix J.

Table 7.9

Associations between Categorical Variables and Breastfeeding Duration

	Fully Breastfeeding		Any Breastfeeding	
Variable	χ^2	*df*	χ^2	*df*
Hospital	.07	1	.03	1
Rurality	.16	1	.81	1
Parity	.19	1	.02	1
Mother's occupation	6.7*	1	6.54*	1
Father's occupation	.22	1	1.79	1
Full time work (intent)	1.14	1	1.52	1
Part time work (intent)	1.54	1	.26	1
Breastfeeding experience	13.37***	1	15.66***	1
Partner's preference	22.07***	1	28.90***	1
Time of feeding decision	15.68***	1	20.61***	1
Planned duration	38.47***	1	57.12***	1
Mother's priorities	.08	1	.20	1
Mothering self-efficacy	.84	1	.01	1

Note. χ^2 = Wilcoxon (Gehan) Statistics from Actuarial Life Tables.
* $p < .05$; ** $p < .01$; ***$p < .001$

7.8 Cox Regression Survival Analyses

To determine whether the psychological variables would significantly predict breastfeeding duration over and above the influence of other related variables, the 12 survey variables observed to be significantly associated with the duration of Fully and Any breastfeeding were entered as predictor variables in two blocks into Cox regression equations. Table 7.10 contains descriptions of the covariates used in the regression equations, and the manner in which covariates were coded.

Table 7.10

Description and Indicator Coding of Criterion and Predictor Variables used to Predict the Cessation of Fully or Any Breastfeeding

Covariate	Indicator Coding
Criterion Variables	
Fully breastfeeding duration	Time (in weeks or half weeks) that the mother reported she was Fully Breastfeeding (0 – 26 weeks).
Any breastfeeding duration	Time (in weeks or half weeks) that the mother reported she was providing Any breastmilk (0 – 26 weeks).
Predictor Variables	
Mother's age	Continuous variable measuring the mother's age in years.
Years of education	Continuous variable measuring the mother's years of formal education in years.
Mother's occupation	1 = usually employed as a professional or associate professional (ASCO* 2-3); 2 = all other ASCO* categories (including no paid employment).
Breastfeeding experience	1 = previously breastfed one baby for at least 6 weeks; 2 = never breastfed one baby for as much as 6 weeks (including primiparous women)

Table 7.10 (cont)

Covariate	Indicator Coding
Partner's preference	1 = partner prefers breastfeeding; 2 = partner ambivalent or prefers artificial feeding/no partner.
Breastfeeding self-efficacy	Continuous variable with a possible range of 14 – 70, where a higher score means greater breastfeeding self-efficacy.
Optimism	Continuous variable with a possible range of 0 – 24, where a higher score means greater dispositional optimism.
Anxiety	DASS-21 anxiety scale, a continuous variable with a range of 0 – 30, where a higher score indicates more frequent or severe anxiety.
Faith in breastmilk	Continuous variable with a possible range of 1 – 5, where a higher score means more faith in breastmilk and less faith in formula.
Breastfeeding expectations	Continuous variable with a possible range of 1 – 5, where a higher score indicates a stronger belief that breastfeeding will be "hard" to accomplish.
Planned duration	1 = plans to breastfeed for 6 months or less; 2 = plans to breastfeed for more than 6 months.
Time of decision	1 = decided to breastfeed before this pregnancy; 2 = decided to breastfeed after becoming pregnant this time.

Note. Reference category for Cox regressions = first. *(Australian Bureau of Statistics, 2001b).

7.8.1 Assumptions of Cox Regression

Before beginning the Cox regression survival analysis procedure, the data set was inspected for its compliance with the assumptions of Cox regression. Survival analysis is sensitive to multicollinearity, which exists when the independent variables are highly correlated. Tabachnick and Fidell (2001) suggest caution when

including two variables with a correlation of 0.70 or more in the same analysis. Inspection of the current data revealed that the highest correlation amongst the set of covariates was that between Depression and Stress, being $r_s = .40$, and therefore below the 0.70 cut-off. Tolerance scores were also computed for the set of continuous variables to further test for multicollinearity. Pallant (2005) contends that tolerance of less than .10 indicates a high multiple correlation with other variables, and therefore the possibility of multicollinearity. The lowest Tolerance statistic in the current data set was .85, further indicating a lack of multicollinearity among the covariates. No multivariate outliers were detected in the data using Mahalanobis Distance, χ^2 (5, = 20.52, $p < .001$).

At the first interview, 21 participants reported that they had never attempted to breastfeed this baby, and an additional nine participants had never initiated Fully breastfeeding. As this survival analysis has the time of weaning as its focus, women who had not initiated Fully or Any breastfeeding (duration = 0) were dropped from the respective survival analyses in order to meet the assumptions of this procedure. This left a sample of $n = 342$ participants who initiated Fully breastfeeding, and $n = 351$ participants who initiated Any breastfeeding for the analysis.

Peduzzi, Concato, Feinstein and Holford (1995) caution that the accuracy, precision and significance of the coefficients resulting from the use of Cox regression will become untrustworthy when the number of events per independent variable (EPV) is too low. Using Monte Carlo simulation techniques, these authors concluded that a value of EPV ≥ 10 was most prudent, and that the results of proportional hazards regression analyses which utilised samples with an EPV below ten should be interpreted with caution. Less conservatively, Eliason (1993) suggests that a sample size of 50 is adequate to conduct Cox regression if there were five or fewer covariates, with larger samples required for more covariates. Of the 342 participants who initiated Fully breastfeeding and provided complete data sets, 302 had ceased Fully breastfeeding (event occurred) at 26 weeks, allowing the inclusion of up to 30 covariates, and ample power to test the current model for the cessation of Fully breastfeeding (12 covariates). As more women were still providing at least some breastmilk to their child at 6 months (Any breastfeeding) than were Fully breastfeeding, there were less events per variable in the data set for Any breastfeeding than was the case with Fully breastfeeding. Power for the Any breastfeeding analysis was therefore lower, but still sufficient. Of the 351 women

who initiated Any breastfeeding and provided complete data sets, 137 had ceased Any breastfeeding at 26 weeks (event occurred), allowing a recommended maximum of 13 covariates in the model. The current Any breastfeeding analysis which employs 12 covariates is therefore within the recommended limit.

Cox regression is also performed assuming that cases lost to follow-up do not differ systematically from those whose fate is known at the end of the study (Tabachnick & Fidell, 2001). The number of cases lost to follow-up was relatively small in this study (n = 26), and these losses occurred only when telephone contact could not be made after a minimum of five attempts. A dichotomous dummy variable was created to separate the scores of those remaining in the study from those lost to follow-up, and entered as the dependent variable in a regression analysis with the 12 covariates serving as independent variables. No significant differences were found between these two groups on any variable considered for inclusion in the Cox regressions. Therefore, there was no reason to believe that cases that were censored because they were lost to follow-up differed systematically from those who remained.

It is also assumed that the things which affect "survival" at the beginning of the study are the same as those that affect it at its end (Tabachnick & Fidell, 2001, p.776). Although factors such as social and economic climate remain uncontrolled potential sources of variability, there were no known changes in the variables affecting breastfeeding duration in the sample during the study period.

The proportional hazards model used in Cox regression also assumes that the relationship between survival rate and time is the same for all covariates (Tabachnick & Fidell, 2001). This assumption was tested by examination of the interactions of each covariate with a variable representing the natural logarithm of time (Tabachnick & Fidell). Using α = .004 to account for familywise error among the time-covariate interactions being evaluated, no significant interactions between covariates and the time covariate were observed. Therefore, the assumption of proportionality of hazards was met. With all the assumptions of Cox regression therefore met by the data set, the analysis of the ability of psychological factors to predict breastfeeding duration began, firstly using data for the duration of Fully breastfeeding.

7.8.2 Duration of Fully Breastfeeding

Three hundred and forty-two cases entered the Cox regression for Fully breastfeeding, with 40 cases censored, either because they were still Fully breastfeeding at 26 weeks (n = 14), or were lost to follow-up (n = 26). The results of the Cox regression for the duration of Fully breastfeeding can be found in Table 7.11. The five socio-demographic covariates entered at Step 1 were found to significantly predict the premature cessation of Fully breastfeeding, χ^2 (5) = 26.98, p = .000, with the strength of association between the Step 1 covariates and survival time being R^2 = .08. Among these five socio-demographic variables, the partner's infant feeding preference arose as a significant unique predictor of the duration of Full breastfeeding.

The inclusion of significant psychological factors at Step 2 of the regression significantly increased the model's ability to predict the premature cessation of Fully breastfeeding, χ^2 (7) = 54.78, p = .000. The relative association between Fully breastfeeding cessation and scores on the psychological variables, after adjustment for socio-demographic covariates was R^2 = .17. Overall, the model with all variables included moderately predicted the premature cessation of Fully breastfeeding in this sample, χ^2 (12) = 83.74, p = .000, R^2 = .27.

Alpha for the significance of covariates entered into the analysis was set at a conservative level of $p < .004$ to adjust for inflated familywise error for 12 covariates (Tabachnick & Fidell, 2001). After controlling for all variables in the model (Step 2), the woman's faith in breastmilk and her planned duration of breastfeeding were reliable unique predictors of the premature cessation of Fully breastfeeding. The probability of continuing to Fully breastfeed increased by approximately 36% (1.36 times) for every one-point increase in score on the Faith in Breastmilk scale, and participants were 1.72 times more likely to cease Fully breastfeeding prematurely if they had planned to breastfeed for 6 months or less.

Table 7.11

Results of the Cox Regression Predicting Duration of Fully Breastfeeding

Covariate	*B*	*SE*	Odds ratio	95% CI	*p*
Step 1 – Socio-demographic variables					
Years of education	-.05	.03	.96	.91-1.01	.084
Mother's occupation	.06	.17	1.06	.77-1.47	.720
BF experience†	-.24	.13	.79	.62-1.01	.060
Partner's preference	-.49	.14	.61	.46-.81	.001*
Mother's age	-.03	.01	.97	.95-1.00	.036
Step 2 – Addition of Psychological variables					
Years of education	-.05	.03	.95	.90-1.00	.066
Mother's occupation	.03	.17	1.03	.74-1.44	.868
BF experience†	.02	.13	1.02	.78-1.32	.903
Partner's preference	-.26	.15	.77	.57-1.04	.084
Mother's age	-.03	.01	.97	.94-.99	.007
BF self-efficacy†	-.02	.01	.98	.96-.99	.008
Optimism	.01	.02	1.01	.98-1.05	.544
Anxiety	-.02	.01	.99	.97-1.01	.144
Faith in breastmilk	.31	.09	1.36	1.14-1.62	.001*
BF expectations†	.01	.07	1.01	.88-1.17	.853
Planned duration	.55	.14	1.72	1.31-2.27	.000*
Time of decision	-.26	.14	.77	.58-1.02	.065

Note. †BF = breastfeeding; *significant predictors; $N = 342$; Reference category = first; Step 1 $R^2 = .08$; Step 2 R^2 *Change* = .17; Overall $R^2 = .27$.

Figure 7.1 depicts the survival function for Fully breastfeeding in the sample at the mean of the 12 covariates. The survival curve reveals a sharp drop in the rate of Fully breastfeeding in the first 2 weeks, followed by a more gradual reduction until approximately 17 weeks, after which the rate of survival drops more sharply, particularly at 22 and 24 weeks post-partum.

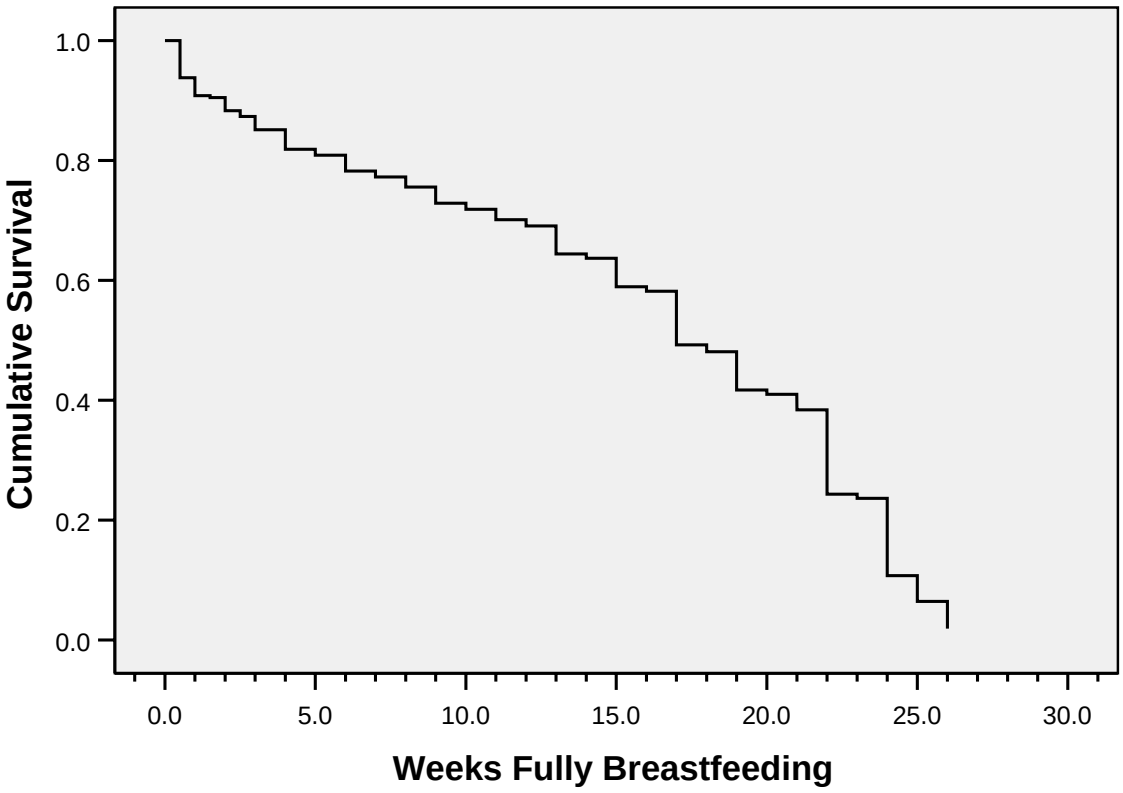

Figure 7.1

Survival Function for Full Breastfeeding at Mean of Covariates

7.8.3 Duration of Any Breastfeeding

To investigate the possibility of differences between the variables influencing the duration of either Fully or Any breastfeeding, the analysis was repeated using the duration of Any breastfeeding as the time variable of interest. Three hundred and fifty-one cases were entered into the Cox regression for the duration of Any breastfeeding, with 214 cases censored, either because they were still breastfeeding at 26 weeks (n = 188), or were lost to follow-up (n = 26). The results of this regression are presented in Table 7.12.

Table 7.12

Results of the Cox Regression Predicting Duration of Any Breastfeeding

Covariate	*B*	*SE*	Odds ratio	95% CI	*p*
Step 1 – Socio-demographic variables					
Years of education	-.06	.04	.94	.87-1.02	.114
Mother's occupation	-.15	.27	.86	.51-1.47	.586
BF experience†	-.66	.19	.52	.36-.75	.001*
Partner's preference	-.99	.18	.37	.26-.53	.000*
Mother's age	-.02	.02	.99	.95-1.02	.376
Step 2 – Addition of Psychological variables					
Years of education	-.08	.04	.92	.85-1.00	.050
Mother's occupation	-.18	.28	.83	.49-1.43	.508
BF experience†	-.22	.20	.80	.55-1.18	.264
Partner's preference	-.50	.20	.61	.41-.90	.013
Mother's age	-.03	.02	.97	.93-1.00	.075
BF self-efficacy†	-.05	.01	.95	.93-.97	.000*
Optimism	.03	.03	1.03	.98-1.08	.296
Anxiety	-.01	.02	.99	.97-1.02	.620
Faith in breastmilk	.53	.15	1.70	1.26-2.29	.001*
BF expectations†	.04	.12	1.04	.82-1.31	.759
Planned duration	.79	.19	2.19	1.52-3.16	.000*
Time of decision	-.14	.20	.87	.60-1.28	.487

Note. †BF = breastfeeding; *significant predictors. $N = 351$; Reference category = first; Step 1 $R^2 = .15$; Step 2 R^2 *Change* = .29; Overall $R^2 = .49$.

The five covariates entered at Step 1 were found to significantly predict the premature cessation of Any breastfeeding, $\chi^2 (5) = 49.51$, $p = .000$, with the strength of association between the Step 1 covariates and the duration of Any breastfeeding being $R^2 = .15$. Among the five socio-demographic variables entered at Step 1, both the woman's previous breastfeeding experience and the infant feeding preferences of her partner arose as unique predictors of the duration of Any breastfeeding.

The inclusion of the psychological variables at Step 2 of the regression significantly increased the model's ability to predict the premature cessation of Any breastfeeding, $\chi^2 (7) = 90.62$, $p = .000$. The relative association between cessation of

Any breastfeeding and scores on the psychological measures was $R^2 = .29$ after adjusting for the other covariates. Overall, the model with all variables included strongly predicted the premature cessation of Any breastfeeding in this sample, $\chi^2 (12) = 148.62$, $p = .000$. $R^2 = .49$.

Using $p < .004$ to adjust for inflated familywise error rate for 12 covariates, three psychological variables were found to be reliable predictors of the duration of Any breastfeeding at Step 2, after adjusting for the contribution of all others. These were breastfeeding self-efficacy, faith in breastfeeding and the woman's planned duration of breastfeeding. Every one-point increase in BSES-SF score resulted in an increase in the likelihood of continuing Any breastfeeding of approximately 5% (score range 14-70). Also, women were 1.70 times more likely to continue Any breastfeeding for each one-point increase on the Faith in breastmilk measure (score range 1-5), and were more than twice as likely to cease breastfeeding prematurely if they had planned to breastfeed for 6 months or less (*odds ratio* = 2.19).

Figure 7.2 depicts the survival function for Any breastfeeding in the sample at the mean of all 12 covariates. The survival curve reveals a relatively steady drop in the rate of Any breastfeeding over the 26 week period, with the exception of more pronounced reductions in the breastfeeding rate at 8, 13, 22 and 26 weeks.

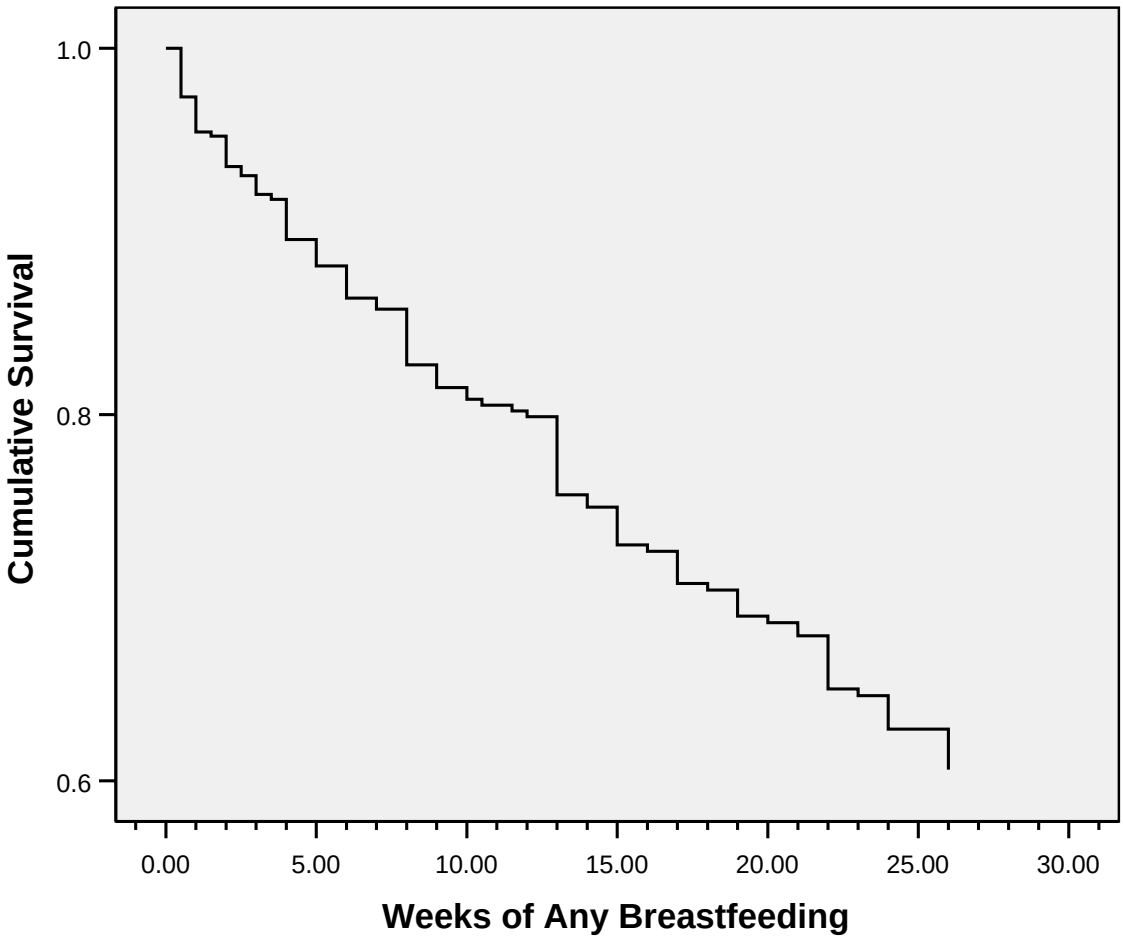

Figure 7.2

Survival Function for Any Breastfeeding at the Mean of Covariates

7.9 Qualitative Comments

Study participants were also invited to provide additional, written comments on their breastfeeding experience if they desired. Of the 374 eligible participants, 43 (11.5%) chose to provide additional qualitative comments in the box provided for this purpose at the end of the first questionnaire (THSD *n* = 20; St Vincent's *n* = 23). Participants provided some specific suggestions regarding perceived social and health system barriers to breastfeeding including (1) the need for antenatal education to include a more realistic picture of possible breastfeeding problems and challenges, (2) the need to preserve the woman's dignity and privacy when assisting with breastfeeding in the postnatal period, (3) the need for more breastfeeding facilities in public places, and (4) concerns about the frequent provision of conflicting advice about breastfeeding from health professionals. Additionally, seven principal themes

emerged from the qualitative comments, as summarised in Table 7.13. Of these, the most commonly raised issue was the negative impact on women of social and health system pressures to breastfeed (*n* = 10). The importance of support and information to breastfeeding women was also a commonly raised issue (*n* = 9).

Table 7.13

Principle Themes Emerging from Additional Comments Provided by Study 2 Participants

Theme	Thick Description	*N*
Pressure to breastfeed leads to feelings of failure for Artificially feeding women	*"I was pushed to breastfeed"* *"… feel a bit like you've failed and let the baby down"* *"*[pressure to] *… be a 'real' woman and breastfeed"*	10
Support and information is important to breastfeeding success	*"I … have a support network in place should any challenges occur this time – which is very important for my own peace of mind!"*	9
Breastfeeding expectations make a difference	*"Nobody mentioned how hard it can be"*	4
Experiences of social disapproval of breastfeeding (especially in public and/or babies > 4 months old)	*"I felt ashamed and embarrassed and found myself lying to them and saying I wasn't breastfeeding my child any more, and tended not to breastfeed in public"*	3
Importance of breastfeeding confidence	*"You either think you can or you think you can't – either way you're right*"	3
Perseverance is crucial to breastfeeding success	*"It requires a lot of perseverance and patience"*	3
Priorities (putting baby first)	*"… my age and experiences allowed me to put the baby's needs well beyond my own"*	2

7.10 Conclusion

This chapter discussed all steps in the analysis of the data arising from Phase 2 of the study. Preliminary steps in the analysis included the inspection and treatment of missing data, variable coding, and the inspection of univariate and bivariate distributions. Breastfeeding rates for the sample and the results on measures of psychological variables were then analysed, before the analysis progressed to the study's major focus, being the relationship between survey variables and the duration of breastfeeding. All variables with a statistically significant relationship to the duration of breastfeeding were entered into a Cox regression equation in two steps, with significant socio-demographic variables being entered at Step 1, and significant psychological variables entered at Step 2. With all variables taken into consideration the woman's faith in breastmilk and her planned breastfeeding duration were unique predictors of the duration of Fully breastfeeding. Analysis of the data for the duration of Any breastfeeding revealed three unique predictors including faith in breastmilk, planned breastfeeding duration and breastfeeding self-efficacy. Qualitative data arising from the study included specific suggestions regarding perceived social and health system barriers to breastfeeding, in addition to seven themes contained within the qualitative data. The next chapter of this dissertation will discuss these Phase 2 results in relation to the results of Phase 1 and the extant literature.

Doing what little one can to increase the general stock of knowledge is as respectable an object of life, as one can in any likelihood pursue

Charles Darwin

Chapter Eight: Discussion

This chapter will discuss the results of Phase 2, and the relationship between these results and the qualitative insights provided by the participants of Phase 1. The results of previous research into the factors investigated in Phase 2 will also be discussed in relation to these findings. The chapter is separated into sections which initially address over-arching issues including breastfeeding rates and the incidence of depression, anxiety and stress in the sample. Socio-demographic factors tested for their relationship to breastfeeding duration are then briefly addressed, before the discussion progresses to the psychological variables under investigation. Discussion of these psychological variables begins with those factors which displayed no significant relationship to breastfeeding duration, and the insights related to these factors and their measurement gained by the research. Psychological factors significantly related to breastfeeding duration will then be discussed sequentially. This section begins with those factors whose influence was ultimately subsumed by the set of predictors as a whole, and ends with a discussion of the three psychological factors which uniquely predicted the duration of breastfeeding over and above the influence of all other variables in the set. The limitations of Phase 2 will then be acknowledged and suggestions made to address these limitations in future research where appropriate.

8.0 Introduction

This research aimed to identify and explore individual psychological differences between postnatal women, and the relationship between these variables and the duration of Fully and Any breastfeeding. Phase 1 aimed to gather the wisdom and insights of four groups of women with regard to the psychological influences on breastfeeding duration. Three of these groups were comprised of women whose experiences as breastfeeding mothers differed from each other, and one group was comprised of health professionals who had spent many years supporting women to breastfeed. These valuable insights and the results of previous studies were taken into account when deciding the psychological factors to be

included in Phase 2, and will form the background to the discussion which follows. Of the 15 individual psychological differences chosen for inclusion in Phase 2, eight factors (including the factor ranked number one by Phase 1 participants) had no statistical relationship with the duration of breastfeeding. However, this lack of statistical significance in no way detracts from the qualitative evidence which exists in the results of Phase 1 and the extant literature. Concepts arising from perceptions and subjective experience are not easy to articulate, much less to measure, and the development of valid and reliable instruments may take many years. It is hoped that this research will prompt others to explore these constructs further.

Seven other psychological factors were significantly related to the duration of breastfeeding. Longer breastfeeding durations were associated with lower levels of anxiety, greater dispositional optimism, deciding to breastfeed before becoming pregnant, and expecting that breastfeeding would be easy. Also, women who planned to breastfeed for 6 months or more, women who had greater faith in breastmilk and/or women who had stronger breastfeeding self-efficacy breastfed for longer, and any one of these three factors were unique predictors of the duration of Any breastfeeding, after all other factors in the set were taken into account. Two of these factors (longer planned duration of breastfeeding and stronger faith in breastmilk), were also unique predictors of a longer duration of Fully breastfeeding. The finding that individual psychological factors were capable of predicting breastfeeding duration over and above the large number of socio-demographic and other variables in the design lends strong support to their importance in increasing breastfeeding duration.

The results also showed that the duration of breastfeeding in this cohort remained well below national targets, with only 10% of mothers Fully breastfeeding at 6 months of age. Of further concern is the finding that more than 44% of women in this sample were classified as suffering from some form of postnatal distress at the time of the first interview (i.e., depression, anxiety and/or stress). These over-arching issues will be discussed first.

8.1 Breastfeeding Rates

Australia's National Health Goals and Targets for the year 2000 included aims to increase Exclusive breastfeeding rates to 90% at hospital discharge and 50% at 6 months, and a target of 80% of babies being breastfed at all (Any breastfeeding)

at 6 months of age (Nutbeam, Wise, Bauman, Harris, & Leeder, 1993). The WHO definition of Exclusive breastfeeding allows for the infant to be fed only medically necessary preparations such as drops and syrups (vitamins, minerals, medicines) in addition to breastmilk (WHO, 1991), and therefore is more restrictive than the Fully breastfeeding category used in this research. Fully breastfeeding refers to infants who receive their primary source of nutrition from breastmilk, and is equal to the sum of the WHO categories of Exclusive breastfeeding and Predominant breastfeeding (Appendix A). We would therefore expect that the rate of Fully breastfeeding in this study would be higher than the Exclusive breastfeeding rate. Despite this, the results of this study reveal that while Fully breastfeeding rates at hospital discharge are close to the national target for Exclusive breastfeeding, 6 month Fully breastfeeding rates in the Toowoomba region remain well below the Exclusively breastfeeding targets set for the year 2000. Table 8.1 contains a comparison between the results of Phase 2 of the current study and those found in women giving birth in the same two hospitals in 2001. The Phase 2 data suggests little improvement in 6 month breastfeeding rates, with only 10% of women Fully breastfeeding, and 54% of babies receiving Any breastmilk in 2005, compared to 7% and 55% in 2001. These rates remain a long way below the 50% Exclusive and 80% Any breastfeeding targets set for Australia.

Table 8.1

Approximate Breastfeeding Rates for Toowoomba Hospitals 2001 and 2005

Study	Sample	Discharge		6 months	
		Fully	Any	Fully	Any
IFSS* Phase 1 (2001)	St Vincent's	87%	95%	7%	60%
	THSD	74%	82%	7%	50%
	Overall	81%	89%	7%	55%
Current Study (2005)	St Vincent's	85%	92%	11%	55%
	THSD	80%	90%	9%	53%
	Overall	83%	91%	10%	54%

Note. *Toowoomba Infant Feeding Support Service Project: Phase 1 (Hegney et al., 2003)

One factor contributing to these low Fully breastfeeding rates at 6 months is the early introduction of solid foods to the baby's diet. In response to overwhelming research evidence (WHO, 2001) the National Health and Medical Research Council guidelines regarding the introduction of solid foods to infants were altered in 2003 to reflect an increase in the recommended age of first solids from 4 to 6 months, to 6 months of age. While 2 years had passed between these changes and the collection of data for the current study, it seems possible that many women were not made aware of these changes and/or the possible impact of earlier solids on the child's health. The fact that many women did not consider the introduction of solids to be of much significance to the child's diet was evident during 6 month data collection for the current study. When asked how they were feeding their baby at 6 months, almost 48% of participants reported that they were feeding their baby "breastmilk only". It was only specific questions regarding the introduction of solids which revealed that in fact many of these participants were classified as Complementary breastfeeding due to the addition of solids to the baby's diet.

Further inspection of the data revealed that 88% of women in the study met the previous guidelines by introducing first solids to their baby between 4 and 6 months of age. Addressing this gap may be important to meeting the national target for Exclusive breastfeeding, as 43% of women in this sample would have been classified as Fully breastfeeding if solids were not introduced prematurely, instead of the current 10%. Delaying the introduction of solids would therefore bring the 6 month rate much closer to the national goal of 50% Exclusively breastfeeding. This suggests that research focussing on the factors contributing to the early introduction of solids and strategies to modify this behaviour is warranted.

8.2 Depression, Anxiety and Stress in the Sample

Data collected for this study also suggest that a large proportion of postnatal women in this area of Queensland suffer from some form of postnatal distress (Miller, Pallant, & Negri, 2006), defined as the experience of symptoms of stress, anxiety and/or depression which are more frequent or severe than would be expected in a normal sample. Results on the DASS-21 show that symptoms of stress alone were experienced by 7.5% of the sample, problematic anxiety alone was experienced by almost 22% of participants, and co-morbid anxiety and depression by a further 12%. In fact, more than 44% of women participating in this research showed

symptoms of postnatal distress. Table 8.2 contains a comparison of these results with those obtained by Miller, Pallant and Negri (2006) in their recent investigation of postnatal distress in a sample of women from Melbourne, Australia.

It should first be noted that mothers in the Melbourne sample had babies between 6 and 26 weeks old, considerably older than those of the current sample, who were 0 to 2 weeks old when they completed the DASS-21 scales. Also Miller, Pallant and Negri's (2006) sample was comprised of primiparous volunteers from local mothers' groups, and this group of women may differ from that participating in the current study. However, comparison of these results using Miller et al.'s descriptors does suggest that while the experience of simple depression is somewhat less common in the current sample, more women from the current study experienced anxiety, co-morbid anxiety and depression, or stress, and more women were classified as experiencing some form of postnatal distress overall (44% of Phase 2 participants, 29% of the Melbourne sample). No other comparable study could be found in the extant literature which measured depression, anxiety and stress in postnatal women, and it may be that these results are typical of women in the first 14 days after birth. However, this finding suggests that many women would benefit from the provision of postnatal screening, support and treatment for symptoms of postnatal distress.

Table 8.2

Classification of women on DASS-21

	This sample*		Miller, Pallant & Negri†	
State	*n*	%	*n*	%
Depressed only	11	3%	38	11.7%
Anxious only	81	21.8%	18	5.5%
Anxious-Depressed	45	12.1%	23	7.1%
Stressed only	27	7.3%	15	4.6%
Total distressed	164	44.1%	94	28.9%

Note. *N = 372, 0–2 weeks old; †(N = 325, 6-26 weeks old; Miller, Pallant, & Negri, 2006)

8.3 Effect of Socio-Demographic Characteristics

The relationship between breastfeeding duration and socio-demographic variables has been well covered in the literature, and the results of the current study were in line with the findings of many previous researchers. In fact, the confirmatory nature of the current results suggests that many characteristics of this sample of women are comparable with those of samples utilised in past research investigating breastfeeding duration. This may strengthen the ability to generalise the study results to a wider portion of Australian women.

8.3.1 Socio-Demographic Variables Not Associated with Breastfeeding Duration in this Sample

Six of the socio-demographic variables held no significant association with the duration of breastfeeding in this sample. These were hospital of birth, rural/remote residence, parity, planned return to full time or part time employment and the father's usual occupation. Similar to one previous study in this area of Southern Queensland, no significant association was found between breastfeeding duration and the hospital in which the birth occurred, or between breastfeeding duration and rural/remote as opposed to regional residence (Hegney et al., 2003). Similarly, no effect of parity was evident in this sample. While this finding is contrary to that of some researchers (Bourgoin et al., 1997; Bulk-Bunschoten, van Bodegom, Reerink, Pasker-de Jong, & De Groot, 2001; Chen, 1993; O'Campo, Faden, Gielen, & Wang, 1992; Salt, Law, Bull, & Osmond, 1994), some other studies have also failed to find a significant association between parity and breastfeeding duration (Amatayakul et al., 1999; Boulton & Landers, 1999; Kumar, Nath, & Riddaiah, 1989). Also, the woman's intent to return to full or part time employment after the birth was not significantly associated with the duration of breastfeeding. As with parity, this result supports that of some previous researchers (Gielan, Faden, O'Campo, Brown, & Hendricks, 1991; Kimbro, 2006) and is contrary to the findings of others (Hegney et al., 2003). Finally, the usual occupations of both mothers and fathers were included in the model as indicators of socio-economic status. Results showed that the father's usual occupation was not associated with breastfeeding duration while the mother's was. This is contrary to the findings of Boulton and Landers (1999), who found a significant relationship

between both the mother's and the father's usual employment in professional or paraprofessional occupations and breastfeeding duration.

8.3.2 Socio-Demographic Variables Associated with Breastfeeding Duration in this Sample

While the current findings differed from those of Boulton and Landers (1999) with regards to the father's occupation, both studies found significant associations between the mother's usual occupation and the duration of breastfeeding. As with the current study, these authors found that the mother's usual occupation as a professional or paraprofessional was associated with longer breastfeeding duration. In both studies, women who were usually employed in professional or associate professional occupations were more likely to continue breastfeeding than women usually employed in other occupational categories. This finding may tentatively suggest an association between socio-economic status and breastfeeding such as that noted by other authors (Lowe, 1993; Nutbeam, Wise, Bauman, Harris, & Leeder, 1993). However, the difficulties inherent in the measurement of socio-economic status, and the lack of any significant influence of the father's occupation in a postnatal sample (when women are less likely to be employed), along with the likely confounding influence of the woman's education, must be taken into account.

Many of the other socio-demographic variables significantly associated with breastfeeding duration in the current study have also been reported as significant by previous researchers in this area. These included a positive association between breastfeeding duration and the mother's age (Kuan et al., 1999; Landers, Hughes, & Graham, 1998; Novotny et al., 2000; Weng, 2002), level of education (Australian Bureau of Statistics, 2003; Boulton & Landers, 1999), previous breastfeeding experience (Nagy, Orvos, Pál, Kovács, & Loveland, 2001; Novotny et al., 2000; Reifsnider & Eckhart, 1997; Shiva & Nasiri, 2003) and her partner's preference for infant feeding method (Arora, McJunkin, Wehrer, & Kuhn, 2005; Bevan, Mosley, Lobach, & Solimano, 1984; Binns, 2004; Landers, Hughes, & Graham, 1998; O'Brien & Fallon, 2005; Scott, Aitkin, Binns, & Aroni, 1999; Scott, Landers, Hughes, & Binns, 2001a, 2001b; Swanson & Power, 2005; Whelan & Lupton, 1998). This list of socio-demographics is relatively exhaustive, and covers most of the important factors reported in the literature. However, as a group they achieved only $R^2 = .08$ for Fully breastfeeding, and $R^2 = .15$ for Any breastfeeding duration,

suggesting that these factors were only relatively weakly associated with the duration of breastfeeding. However, inspection of the data measuring the relationship between breastfeeding duration and psychological factors in the design significantly strengthened the association between the variables in the data set and the duration of breastfeeding.

8.4 Effect of Psychological Characteristics

8.4.1 Psychological Factors Not Associated with Breastfeeding Duration in this Sample

There were eight psychological variables measured which were not statistically associated with breastfeeding duration. However, the realm of psychology is rarely a simple matter and this must be interpreted in light of the weight of qualitative evidence supporting the inclusion of these factors in this study. That this set of psychological factors are perceived by mothers to be important means that they should not be ignored or dismissed as contributors to the woman's breastfeeding experience, and further efforts to understand the origin and impact of these constructs should be made. Results for some variables in this group may have been influenced by the validity and reliability of the measures used, particularly in the case of the need for freedom, adaptability, current life priorities and achievement striving. Discussion of the non-significant results returned for these and other psychological factors follows, beginning with the perception of restricted freedom experienced by many breastfeeding women.

8.4.1.1 Need for Freedom (Psychological Reactance)

Factors relating to resistance to the perceived restrictions on the mother's freedom imposed by breastfeeding were raised by both the Artificially Feeding (AF) and Complimentary Breastfeeding (CBF) groups in Phase 1. This disagreeable feeling of lost freedom among breastfeeding women has also been reported by other qualitative researchers (Bulk-Bunschoten, van Bodegom, Reerink, Pasker-de Jong, & De Groot, 2001; Kieffer, Novotny, Welch, Mor, & Thiele, 1997; Kirkland & Fein, 2003), but no previous attempt to quantify this factor could be found in the literature. Therefore, after an exhaustive review of associated psychological theory, the decision was made to utilise the construct of psychological reactance to explain this phenomenon. However, no significant relationship between psychological reactance and the duration of breastfeeding was found in this sample.

Psychological reactance is defined as a motivational state created when personal freedoms are threatened or removed (Snyder & Wicklund, 1976). This phenomenon is thought by theorists to be a personality trait (Hong & Faedda, 1996), and it was hypothesised that this trait may explain the apparent differences between women in their perceptions of and reactions to the restrictions imposed by breastfeeding. However this reasoning may have been flawed and it is possible that this construct does not adequately describe the factor under investigation. Also, the scale used to measure this construct was originally validated using a community and university sample (Hong & Faedda, 1996), and no evidence of its use with postnatal women could be found. It is therefore also possible that the scale used to measure this construct is inappropriate for use in postnatal research. Consequently, despite these non-significant results, it may be inappropriate to dismiss individual differences in the need for personal freedoms as a factor influencing breastfeeding duration. Similar measurement concerns cloud the results regarding breastfeeding duration and adaptability.

8.4.1.2 Adaptability

The woman's ability to adapt to the changes inherent in the postnatal period and flexibly accommodate the demands of a new baby was raised by all four Phase 1 groups, and identified as among the "most important" factors by all but the FBF group. Again, this has also been identified as influencing breastfeeding behaviour in previous qualitative research (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005; Hewat & Ellis, 1986; Vandiver, 1997). However, no significant association between results on the measure of adaptability chosen for this research and breastfeeding duration was observed in Phase 2.

As with the need for freedom, the non-significant result on this scale may be due to measurement issues. When describing this factor, Phase 1 participants talked of "… *how flexible and adaptable you are as a person. How you cope with change*." There are many possible explanations for individual differences in behavioural flexibility and the ability to adapt to change. For example, the construct can be related to theories of coping, learning, or personality. The measure chosen arose from the popular "Big-Five" trait-based theory of personality.

The International Personality Item Pool (IPIP) Adaptability scale (Goldberg, 1999) is reported as being based on the measure labelled "Good natured" in the Six Factor Personality Questionnaire (SFPQ; Jackson, Paunonen, & Tremblay, 2000).

Descriptors for individuals achieving high scores on this SFPQ scale include willingly changing opinions, and being accommodating and accepting, while those achieving low scores meet descriptors including defensive, suspicious and guarded. The IPIP authors related these traits to the concept of adaptability. However, with reflection and further research it now seems possible that an alternative measure may have more validly measured the construct under investigation. For example the SFPQ Openness to Experience factor, and in particular the Change facet of this factor, may more closely match the breastfeeding related construct described by Phase 1 participants and previous authors. This facet describes high scorers as flexible and adaptable, liking new experiences and readily adapting to changes in the environment, while low scorers are described as having difficulty in adjusting to changes in the environment, seeking regularity and continuity and disliking the unexpected (Jackson, Paunonen, & Tremblay, 2000). Future researchers may choose to investigate this area further.

Other measurement difficulties which may have impacted on the study results for this factor concerned the scale reliability. Reliability analysis on completion of the study revealed that the IPIP Adaptability scale did not reach the recommended minimum Cronbach's alpha of .70 (Tabachnick & Fidell, 2001). While alpha came close to the minimum after deletion of two items ($\alpha = .69$), the result still suggests that items in the scale may not consistently measure the same underlying construct. This places further doubt on the study results and indicates that additional research using alternative measures is required. Therefore, conclusions regarding the relationship between breastfeeding duration and the woman's ability to adapt to the changes and demands of motherhood would be premature.

8.4.1.3 Mothering Self-Efficacy

Similarly, the influence of the number one factor identified by Phase 1 groups may not have been successfully measured in Phase 2. All four groups participating in Phase 1 indicated that a construct they described as encompassing the mother's priorities and confidence in her mothering abilities was among the "most important" factors influencing her breastfeeding duration. In an effort to measure this construct two separate measures were employed, one being a measure of the woman's current priorities (discussed next), and the other being a measure of mothering self-efficacy taken from the Parenting Sense of Competence Scale (PSOCS; Gibaud-Wallston, 1977). Inclusion of a measure of mothering self-efficacy

was also backed by the findings of one previous study which found a significant relationship between the woman's scores on perceived mothering competence and how well she believed she was coping with breastfeeding at 3 months (Tarkka, Paunonen, & Laippala, 1999).

The distribution of PSOCS scores in the current sample was significantly negatively skewed, indicating a clustering of scores at the high end of the scale and therefore a tendency for respondents to report a strong sense of self-efficacy in their mothering abilities. However, the mean item score in the current sample ($\bar{x}$ = 4.5) was similar to that reported in other research among mothers of infants ($\bar{x}$ = 4.42; (Cutrona & Troutman, 1986). The lack of a significant relationship between mothering self-efficacy and breastfeeding duration in this sample is somewhat surprising, given that mothering and breastfeeding are often seen by mothers as closely related (Hauck & Irurita, 2002; Schmied & Barclay, 1999). The result does however back theoretical claims that the concept of self-efficacy is specific to given behaviours (Bandura, 1977). Given this non-significant result, it is possible that the concept of self-efficacy may not adequately encompass the individual differences between women described by the Phase 1 participants. The same may be true for the concept of life priorities chosen to measure the second aspect of this construct.

8.4.1.4 Current Life Priorities

Phase 1 participants believed that "*You have to put your baby first*" and "*You've just got to set your priorities sometimes …"* Interestingly, this again appeared among qualitative comments provided by Phase 2 participants, who referred to putting "… *the baby's needs well beyond my own*." However, again a relationship between breastfeeding duration and this factor was not supported by the results of Phase 2.

The instrument used to measure the mothers' priorities was constructed by the researcher for this purpose, and the reliability and validity of the scale has not been established. It is therefore not known whether this measure adequately captures the postnatal life priorities of women. Given the underlying suggestion of personal sacrifice in the comments made by participants, it may also be that a simple listing of priorities does not adequately encompass all aspects of the individual characteristic described. However, these results suggest that simply placing the new baby above all other priorities in the woman's life has no influence on the duration of breastfeeding. Regrettably, the fact that neither this factor nor mothering self-efficacy were

associated with breastfeeding duration in Phase 2 suggests that efforts to adequately describe and measure the potentially important "number 1" construct described in Phase 1 may have failed.

8.4.1.5 Achievement Striving

Achievement striving is a more easily recognised and widely researched construct, but again measurement difficulties occurred. Individual differences in achievement striving were considered an influence on breastfeeding duration by both the Exclusively breastfeeding (FBF) and Health Professionals (HP) groups participating in Phase 1. Also, Rentschler (1991) found that achievement motivation predicted breastfeeding duration to 6 weeks when measured using the 38-item Questionnaire Measure of Individual Differences in Achieving Tendency (Mehrabian & Bank, 1978). However, scores on a measure of achievement striving had no relationship to breastfeeding duration in this sample.

As mentioned, results on this factor may again have been influenced by flaws in the measure chosen. The Achievement Striving (AS) scale (Spence, Helmreich, & Pred, 1987) selected for inclusion in Phase 2 was originally constructed for use with students, and minor changes to the wording of four items were necessary to adapt it for use with the current sample (with permission from the scale authors). This may have adversely affected the scales' reliability and validity. Reliability analysis on conclusion of the study revealed a low Cronbach's alpha of $\alpha = .66$, which rose to .69 following deletion of one problematic item. This level is still below the $\alpha = .70$ recommended by Tabachnick and Fidell (2001), signalling problems with its internal consistency. Caution should therefore be used when interpreting the non-significant results on this scale, and future researchers may wish to investigate this relationship further using alternative measures.

8.4.1.6 Self-Esteem

Unlike the scales discussed to date, Rosenberg's Self Esteem Scale (RSES; Rosenberg, 1989) performed well in this sample. In Phase 1, self-esteem was nominated as an influence on breastfeeding duration by all but the FBF group. This relationship has also been noted by previous researchers (Damato, 2005; Papinczak & Turner, 2000; Whelan & Lupton, 1998). However, no significant relationship between self-esteem and the duration of breastfeeding was evident in the results of Phase 2. Despite this, statistical relationships between self-esteem and other variables in the study suggest the possibility of an indirect influence of self-esteem

on breastfeeding behaviour. These included positive correlations between self-esteem and education, adaptability, optimism and breastfeeding self-efficacy, and negative correlations between self-esteem and psychological reactance, expectations that breastfeeding will be difficult, depression, anxiety and stress (Appendix K). Given the large number of significant correlations discovered, it may be that the impact of self-esteem on these alternative factors may influence breastfeeding duration in a less direct manner.

8.4.1.7 Stress

Like the RSES, all three DASS-21 subscales (Lovibond & Lovibond, 1995) performed well in this research. Stress was considered among the "most important" influences on breastfeeding duration by all three groups comprised of mothers in Phase 1, and was also raised as a factor influencing breastfeeding duration by the HP group. However, no significant relationship between stress (psychological tension and agitation) and breastfeeding duration was evident in the results of Phase 2. Research suggests that stress may place breastfeeding at risk by interfering with the milk let-down response (Ueda, Yokoyama, TIrahara, & Aono, 1994). At the same time, other studies show that lactating women may be shielded from experiencing stress due to the protective effect of lactational hormones (Groer, 2005; Groer, Davis, & Hemphill, 2002). Therefore, while stress may place breastfeeding at risk, breastfeeding women are less likely to suffer from stress. These opposing forces may partially explain the lack of a clear statistical relationship between stress and breastfeeding duration in this study.

While a clinical interview is required to diagnose a specific disorders as defined by classification systems such as the DSM and ICD (Lovibond & Lovibond, 1995), a total of 25.8% (n = 96) of the sample were identified as experiencing more frequent or severe symptoms of stress than is considered normal, using the DASS-21. This figure includes the 7.3% of women who were classified as severely or extremely severely stressed (Table 7.4). Most of these women suffered from co-morbid stress and anxiety and/or depression, while 7.3% of the sample suffered from stress without symptoms of depression or anxiety. These data suggest that approximately one in every four postnatal women may benefit from assistance to minimise and cope with stress in the postpartum. Correlations (Appendix K) also revealed that women who scored high on the stress measure tended to score lower on other factors such as self-esteem, optimism and breastfeeding self-efficacy.

However, the lack of a significant relationship between stress and breastfeeding duration in this research suggests that the experience of stress in the first 2 weeks postpartum does not add to the ability to predict breastfeeding duration to 6 months. The same was true of the relationship between depression and breastfeeding duration in this sample.

8.4.1.8 Depression

Two groups participating in Phase 1 identified depression as an influence on breastfeeding duration, but no group member selected depression as among the "most important" factors. This in itself is interesting given the weight of quantitative evidence linking depression to breastfeeding duration (Dunn, Davies, McCleary, Edwards, & Gaboury, 2006; Forster, McLachlan, & Lumley, 2006; Hatton et al., 2005; Henderson, Evans, Straton, Priest, & Hagan, 2003; McLearn, 2006; Papinczak & Turner, 2000; Tammentie, Tarkka, Åstedt-Kurki, & Paavilainen, 2002; Taveras et al., 2003). However, no significant correlation was found between breastfeeding duration and depression in the results of Phase 2.

These unusual quantitative results may be partially explained by the choice of instruments used to measure depression (dysphoric mood) in the current sample. To date, research into postnatal distress has focused largely on postnatal depression, while anxiety and stress in the postpartum have been relatively ignored (Miller, Pallant, & Negri, 2006). Much of the previous research has been conducted using the Edinburgh Postnatal Depression Scale (EPDS; Cox & Sagovsky, 1987), an instrument which correlates strongly with measures of both anxiety and depression, without effectively distinguishing between these two states (Brouwers, van Baarb, & Pop, 2001; Ross, Gilbert-Evans, Sellers, & Romach, 2003; Stuart, Couser, Schilder, O'Hara, & Gorman, 1998). The lack of a significant relationship between depression and breastfeeding duration in the current study may therefore be partly due to the use of the DASS-21 in favour of the EPDS. While not specifically constructed for use in the postpartum, the DASS-21 does not contain items which have been identified as potential confounders to the measurement of postnatal depression. These items are also excluded from the EPDS and include experiences common to new mothers such as sleep disturbance, appetite and/or weight loss, tiredness, lack of energy and poor concentration (Lovibond & Lovibond, 1995). This strengthens the ability of the DASS-21 to validly measure depression in new mothers. Importantly however, depression is also effectively differentiated from anxiety and stress by this

instrument. This may partially explain this study's novel findings, whereby no significant association was found between depression and breastfeeding duration, while breastfeeding duration and anxiety were significantly associated.

What this finding suggests is that postnatal distress may include a strong component of anxiety in addition to depression, and this contention is supported by the literature. Ross, Gilbert-Evans, Sellers and Romach (2003) found a close relationship between anxiety and depression in women during late pregnancy and at 16 weeks postpartum. These authors hypothesise that anxiety may in fact be more common in depression experienced in the postnatal period than in depression experienced at other times. This hypothesis is supported by the results of the present study, where 12% of women were classified as both anxious and depressed, compared to only 3% who were classified as depressed only (Table 8.2). This co-morbid anxious depression is thought to be associated with more severe symptoms and a poorer outcome, and requires the use of specific treatment strategies for both sets of symptoms (Emmanuel, Simmonds, & Tyrer, 1998; Fawcett, 1997). Symptoms of anxiety in patients with a major affective disorder also appear to be an acute risk factor for suicide (Fawcett, 1997). The current findings provide additional evidence for the need to distinguish the features of postnatal depression from those of major depression, and to recognise postnatal distress as a specific diagnostic construct in diagnostic criteria such as the DSM-IV (see also, Ross, Gilbert-Evans, Sellers, & Romach, 2003).

8.4.2 Psychological Factors Significantly Associated with Breastfeeding Duration in this Sample

In total, the study identified seven psychological factors which were statistically associated with the duration of breastfeeding. These included measures of the woman's anxiety, dispositional optimism, the timing of her infant feeding decision, her expectations of the difficulty of breastfeeding, her planned breastfeeding duration, faith in the natural superiority of breastmilk and breastfeeding self-efficacy. Together, these factors significantly increased the ability of the model to predict the duration of both Fully and Any breastfeeding, and were more important to the prediction than socio-demographic factors such as the partner's infant feeding preferences and the mother's previous experience with breastfeeding. As a group, these factors were more strongly associated with

breastfeeding duration than were the socio-demographic factors (Full breastfeeding R^2 = .17, Any breastfeeding R^2 = .29), and therefore greatly increased the model's ability to predict breastfeeding duration. This section will discuss the results obtained for anxiety, optimism, the time of the infant feeding decision and breastfeeding expectations, leaving the final three unique predictors of breastfeeding to be discussed in the section which follows.

8.4.2.1 Anxiety

Having discussed stress and depression in the preceding section, anxiety is the last of the three states posited as indicators of postpartum distress to be discussed (Miller, Pallant, & Negri, 2006). Anxiety is characterised by autonomic arousal and fearfulness (WHO, 2000), and was the most significant and common indicator of distress in this sample. Anxiety was named as a factor by members of the AF group, and was noted as a theme contained within the HP group discussion. Anxiety (as measured by the Duke Health Profile) has also been identified as a significant determinant of breastfeeding behaviour in one Australian study (Papinczak & Turner, 2000), while one other study found no relationship between antenatal anxiety and breastfeeding duration to 3 months (Cooke, Schmied, & Sheehan, 2006). However, the literature contains little research into the effect of anxiety on breastfeeding duration when differentiated from depression.

Lovibond and Lovibond (1995) contend that anxiety is most likely to develop when the individual: (1) faces testing performance demands which are of critical significance for his or her self-esteem; (2) either has low self-esteem or high self-imposed performance demands when these demands are both testing and critical to his or her self-esteem; (3) perceives a high, but not impossibly high possibility of failure; or (4) has a low threshold at which the normal fear system is activated. These conditions may well apply to the breastfeeding experiences of many women.

Though not supported by the current study, a link between breastfeeding performance and self-esteem is supported by the previous literature (Damato, 2005; Labbok, 2001; Mozingo, Davis, Droppleman, & Merideth, 2000; Papinczak & Turner, 2000). Also, anxiety was higher in women with lower self-esteem in this study (r^s = -.26, p < .001). That women may perceive a high (but not impossibly high) probability of failure with breastfeeding also makes sense, given that many of their friends and peers are likely to have weaned before they had intended (e.g., Bailey & Sherriff, 1993). Finally, Lovibond and Lovibond (1995) also acknowledge

that some individuals may be naturally predisposed to the development of problematic anxiety. Given this list of predisposing factors it should come as no surprise that almost 34% (n = 126) of women were identified by the DASS-21 as being more than normally anxious in the current sample, and 12.6% (n = 47) were classified as being severely or extremely severely anxious.

Higher anxiety was associated with being younger, less educated, less optimistic, having less breastfeeding self-efficacy and less faith in breastfeeding, and more expectation that breastfeeding was going to be hard to accomplish (Appendix K). Given that the essence of anxiety is worry and fearfulness, this list contains some clues as to what some common worries may have been. Previous research investigating bonding and attachment has linked anxiety to a preoccupation with infant safety and wellbeing in postnatal women (Feldman, Weller, Lockman, Kuint, & Eidelman, 1999). This fear for the child's welfare may underlie the association between anxiety and lack of breastfeeding self-efficacy, faith in breastmilk and expected problems with breastfeeding that was displayed by this sample. The threat of the failure of breastfeeding may also prompt worries regarding social censure, particularly in the face of the perceived pressure to breastfeed reported in the qualitative comments made by Phase 2 participants.

No other comparable study could be found in the extant literature which reported levels of psychometrically measured anxiety, stress and depression in postnatal women, the closest sample for comparison being that of Miller et al (2006), presented in Table 8.2. It may be that the common occurrence of anxiety in the current sample is normal in women in the first 14 days following the birth. Alternatively, these results may represent unusually high rates which can be attributed to this particular sample, or to this geographical area or period of time. Clearly more research needs to be done before conclusions regarding the prevalence and effect of anxiety in postnatal Australian women can be reached. Nevertheless, the current results suggest that around one in three women participating in this research may have benefited from clinical examination to confirm a diagnosis of anxiety, followed by appropriate support and treatment where indicated. In addition to improving the mental health of participants, the indications are that intervention such as this may also favourably influence breastfeeding duration.

8.4.2.2 Optimism

Women with longer breastfeeding durations in this sample were not only less anxious, but also more optimistic than those who weaned earlier. In Phase 1, optimism was amongst the most important psychological factors influencing breastfeeding duration chosen by the CBF group, and was identified as a theme contained in the discussions of the FBF and AF groups. This Phase 1 finding fits well with the results of Phase 2, which found that optimism was significantly related to breastfeeding duration, such that women who scored higher on a measure of dispositional optimism were less likely to cease breastfeeding prematurely. However, while Wagner et al. (2006) recently reported a significant association between optimism and the initiation of breastfeeding, no previous research investigating the influence of optimism on the duration of breastfeeding could be found in the literature, making this a novel finding.

Research does suggest that optimism may confer some resistance to the development of postpartum depressive symptoms and may also serve as a buffer against the ill effects of stress (Carver & Gaines, 1987). Further support for a beneficial effect of optimism on breastfeeding duration can be found in studies outside of the breastfeeding domain. Researchers have discovered correlations between optimism and individual differences including generalised positive expectations, self-efficacy, persistence and effort, self-esteem, perceived social support, coping, problem solving and managing change (Scheier & Carver, 1992). Any or all of these factors may impact on the duration of breastfeeding. In the current study, women who scored higher on optimism had (among other factors) higher self-esteem and breastfeeding self-efficacy, lower levels of depression, anxiety and stress, and were more likely to believe that breastfeeding would be easy (Appendix K). This fits well with the theory and further supports the inclusion of dispositional optimism in future studies investigating the determinants of breastfeeding duration.

8.4.2.3 Time of Infant Feeding Decision

The time at which the woman made her choice to breastfeed was not among the factors identified by Phase 1 participants, but was included as a result of its predictive ability in previous breastfeeding studies (e.g., Boulton & Landers, 1999; Scott, Landers, Hughes, & Binns, 2001a, 2001b). In one such study, the time of the woman's infant feeding choice was identified as a unique predictor of breastfeeding

duration over and above 12 socio-demographic factors (O'Brien & Fallon, 2005). In this earlier study women who did not decide to breastfeed until after they were pregnant were three times more likely to cease breastfeeding early than those who had decided before pregnancy. However, while the time of decision was significantly associated with the duration of breastfeeding in the current study, it was not a unique predictor. This suggests that the broader list of psychological factors included in the current research may have included some whose influence overlapped with the construct underlying differences in decision time. This information is useful of itself, given the generally strong predictive ability of this variable, and the lack of research evidence of its origins or contributing factors. The previously hypothesised need to introduce programs designed to illicit a breastfeeding decision from women well before a pregnancy is planned (O'Brien & Fallon, 2005) may not be the best use of health system resources. Instead, a focus on the psychological factors whose influence overrides this factor may be a more appropriate and cost effective method of increasing the duration of breastfeeding.

8.4.2.4 Breastfeeding Expectations

Finally, three of the four Phase 1 groups identified the woman's expectations of breastfeeding as a determinant of breastfeeding duration, as have some other qualitative studies. These results have suggested that women who hold highly idealised expectations of breastfeeding as being problem free and easy to accomplish may experience a clash between these expectations and early breastfeeding problems, leading to early weaning (Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005; Mozingo, Davis, Droppleman, & Merideth, 2000). The results of Phase 2 did not support these contentions. In this study, women who thought breastfeeding would be easy tended to breastfeed for longer than those who thought it would be hard.

However, it is important to remember that the large majority of participants completed these measures while still inpatients of the maternity unit, when their baby was an average of 3.5 days old and breastfeeding was being established. The woman's earlier expectations may therefore have been influenced by her early experience of breastfeeding. Lactogenesis occurs at or around day 3, and it is common for women to experience problems including attachment issues, sore nipples and engorgement in these early days (Brodribb, 2006; Cooke, Sheehan, & Schmied, 2003). This may have impacted on the measure, making it more a measure

of the effect of early breastfeeding difficulties than of previously held breastfeeding expectations. The same measure taken during late pregnancy may therefore achieve different results.

Despite this apparently contradicting quantitative evidence, it is worth returning to the results of Phase 1, which showed that the participants believed that it was important for women to have realistic expectations of breastfeeding. This perception is itself of value, particularly as it has been reported by previous authors and was also identified as a theme arising from qualitative comments made by Phase 2 participants. Further supporting this, the most commonly made suggestion for service improvements made by Phase 2 participants was that antenatal education programs should include a more realistic picture of possible breastfeeding problems and challenges. These participants said things like:

> *"I went to breastfeeding class at 36 weeks where I learnt a lot of things [like] how to attach baby, how good breast milk is. But [the] video we watched made it look easy. They should have problems on [the] video and how to deal with them."*

Therefore, the qualitative evidence, coupled with the problematic timing of the Phase 2 questionnaire suggests that interpretation of this significant result should be approached with caution. It is hoped that future research will shed further light on the relationship between breastfeeding expectations and the duration of breastfeeding.

8.4.3 Psychological Factors which Uniquely Predict the Duration of Breastfeeding

The final three psychological factors to be discussed were identified by the research as capable of uniquely predicting how long the woman would breastfeed for, over and above all other variables entered into the model. Given the large number of variables considered (11 socio-demographic and 15 psychological), this ability is a testament to the power of these individual psychological differences over the woman's breastfeeding behaviour. That all three of these variables come from among the psychological factors under investigation confirms the importance of psychological factors over and above any socio-demographic variables. Two of these factors including the woman's planned duration of breastfeeding and her faith in the natural superiority of breastmilk displayed the ability to predict not only the duration

of Any breastfeeding, but also the duration of Fully breastfeeding. The third factor, being the woman's breastfeeding self-efficacy, uniquely predicted Any, but not Fully breastfeeding in the sample.

8.4.3.1 Planned Duration of Breastfeeding

First among the unique predictors of breastfeeding to be discussed is the woman's planned breastfeeding duration, or how long the woman planned to breastfeed for at the time of the first (postnatal) interview. Planned duration was not raised by Phase 1 participants, but instead was included in the design due to evidence of its influence on breastfeeding duration reported by previous authors (Blyth et al., 2004; Boulton & Landers, 1999; Coreil & Murphy, 1998; Donath, Amir, & ALSPAC Study Team, 2004; Forster, McLachlan, & Lumley, 2006; Jordan, 2005; Kronborg & Vaeth, 2004; Landers, Hughes, & Graham, 1998; Loughlin, Clapp-Channing, Gehlbach, Pollard, & McCutchen, 1985; Piper & Parks, 1996; Scott, Aitkin, Binns, & Aroni, 1999; Scott, Landers, Hughes, & Binns, 2001a; Vogel, Hutchison, & Mitchell, 1999; Whaley, Meehan, Lange, Slusser, & Jenks, 2002). In the current study, women who planned to breastfeed for 6 months or less were 1.72 times more likely to cease Fully breastfeeding, and 2.19 times more likely to cease Any breastfeeding before 6 months than those who had planned to breastfeed for more than 6 months.

However, subsequent inspection of the data revealed that while women who reported planning to breastfeed for 6 months or less originally intended to breastfeed for an average of approximately 23 weeks, this group actually breastfed for an average of only 12 weeks (10 weeks Fully), almost half their originally planned breastfeeding duration. Therefore, in addition to planning to breastfeed for shorter than the recommended time, many of these women also gave up breastfeeding considerably earlier than they had originally planned. This highlights the need for research investigating the factors which contribute to planned breastfeeding duration, and strategies to increase the planned duration of breastfeeding is needed.

8.4.3.2 Faith in Breastmilk

A second unique predictor of early breastfeeding cessation in this study was the woman's degree of faith in the natural process of breastfeeding, as opposed to her faith in formula. This psychological factor was raised by each of the four groups participating in Phase 1, and selected as among the "most important" by all but the CBF group, making it the second most important factor identified overall. This

variable has not previously been studied for its affect on breastfeeding duration, though past qualitative studies have suggested that an implicit belief in the natural superiority of breastfeeding may encourage women to continue to breastfeed for longer durations (Bottorff, 1990; Hegney, Fallon, Crepinsek, O'Brien, & Doolan, 2005). The current results suggest that for every one-point increase in the woman's response to the Faith in Breastmilk measure (score range 1 to 5), she was 1.36 times more likely to continue Fully breastfeeding, and 1.70 times more likely to continue Any breastfeeding to 6 months.

The brief (two-item) scale constructed to measure this implicit belief in the natural superiority of breastmilk asked the participant to respond to the following question with regard to each feeding method in turn "*If I feed my baby [1. breastmilk; 2. formula], I can relax and be sure he/she is getting everything he/she needs.*" Responses were then combined to form a single scale with exclusive faith in breastmilk at one end, and exclusive faith in formula at the other. It is possible that results on this measure may tap into infant feeding attitudes measured by instruments such as the popular 17-item Iowa Infant Feeding Attitude Scale, which emphasises the cognitive or belief components of infant feeding attitudes (IIFAS; De La Mora, Russell, Dungy, Losch, & Dusdieker, 1999). However, one important distinction is that the Faith in Breastmilk measure emphasises the woman's personal response to her beliefs regarding each method of infant feeding ("… I can relax and be sure …"), while comparable items on the IIFAS (e.g., "Breastmilk is the ideal food for babies") emphasise the over-arching theoretical issues in favour of individual responses to this knowledge. Women may acknowledge that breastmilk is best, while at the same time lack confidence in breastfeeding as a feeding method for themselves personally (e.g., concerns about knowing whether the baby is getting enough, or about their personal ability to breastfeed successfully). The Faith in Breastmilk measure may therefore tap into the woman's breastfeeding self-efficacy in addition to her beliefs about breast or formula feeding. This is supported by the strong correlation found between these two measures ($r^s = .40$, $p < .001$).

In this study, women with high scores on Faith in Breastmilk were more educated than low scorers. They had more breastfeeding self-efficacy and were more likely to think breastfeeding would be easy for them; they were less adaptable but also less likely to suffer from symptoms of anxiety (Appendix K). Further research which includes both the IIFAS and the Faith in Breastmilk measure, and potentially

also measures of breastfeeding self-efficacy and breastfeeding knowledge, may provide a deeper understanding of the important predictive construct being measured by this instrument.

8.4.3.3 Breastfeeding Self-Efficacy

Finally, degree of breastfeeding self-efficacy was named as one of the "most important" psychological factors influencing breastfeeding duration by both the CBF and AF groups in Phase 1, resulting in this factor being ranked number five overall. Many previous quantitative studies have also reported a significant association between breastfeeding self-efficacy and the duration of breastfeeding (Blyth et al., 2002; Blyth et al., 2004; Creedy et al., 2003; Dennis & Faux, 1999; Ertem, Votto, & Leventhal, 2001). In Phase 2, breastfeeding self-efficacy uniquely predicted the duration of Any (but not Fully) breastfeeding when all other factors were taken into account. Every one-point increase in breastfeeding self-efficacy score was associated with a 5% decrease in the likelihood of early weaning (score range = 14 to 70). This result supports previous research in this area of Queensland with regard to Any, but not Fully breastfeeding duration. This earlier research found that breastfeeding self-efficacy scores uniquely predicted the duration of both Fully and Any breastfeeding after adjusting for the influence of 12 major socio-demographic variables. Similar to the current results for Any breastfeeding, this earlier study (O'Brien & Fallon, 2005) revealed a 6% decrease in the probability of early breastfeeding cessation for every one-point increase in breastfeeding self-efficacy score. However though Fully breastfeeding duration and breastfeeding self-efficacy were significantly associated in Phase 2, unlike this earlier study this factor uniquely predicted the duration of Any, but not Fully breastfeeding in the current study. There was an important difference in the length of time used as the criterion variable in the two studies (6 weeks in the earlier study and 26 weeks in Phase 2) which may have contributed to these differences. The differing result may also be due to the inclusion of additional psychological factors in the current design such as anxiety, faith in breastmilk, optimism and breastfeeding expectations, which may have influenced the mother's decision to introduce supplemental foods to the infant prematurely and thus cease Fully (but not Any) breastfeeding. Nevertheless, the current study confirms the importance of this factor while again displaying the predictive ability of the brief, self-report BSES-SF (Dennis, 2003).

8.5 Study Limitations

As is the case with the majority of scientific research, there are several limitations to the current study which should be taken into account when attempting to draw conclusions from its results. One of these limitations is the time of participant follow-up. Given that current National Health and Medical Research Council guidelines (NHMRC, 2003) recommend that the mother continue to breastfeed for 12 months and beyond, research into breastfeeding duration should ideally follow up participants for at least this period of time. However, the employment of a 6 month follow-up period in this study is defensible given the large number of Australian women who cease breastfeeding during this period, and the strong research evidence of the importance of 6 months of Exclusive breastfeeding for the health and wellbeing of both the mother and her child (NHMRC, 2003).

Also, while the study's participation rate compares well with other postnatal research, caution in generalising the study's results is warranted. Previous research in the area suggests that significant differences in the demographic characteristics of respondents and non-respondents may exist, such that younger and unmarried women are less likely to participate (Boulton & Landers, 1999; Hegney et al., 2003; O'Brien, 2003). It should also be noted that the current study excluded participation by women less than 18 years of age. Caution in generalising these results to this group of women is therefore recommended. Given that these demographic characteristics may place women at higher risk of early breastfeeding cessation, every effort should be made to maximise the likelihood that this group of women is included in future research or interventions. As a lack of motivation may be a factor in their decision not to participate, strategies such as shortened questionnaires, hospital bedside interviewing, and the provision of rewards for participation (within the limits of ethical considerations), may need to be investigated as incentives to participate.

Another concern is that the sample is reasonably homogenous, particularly with regard to marital status (92% married or defacto relationships) and English language proficiency (100%). Generalisation to more heterogenous communities without these characteristics may not be appropriate. However, in acknowledging this, it must also be noted that while most studies gather data from a single maternity ward, this study included data from two maternity wards, one public and one private,

thus increasing the likelihood that results from this study may generalise to other women giving birth in Australian hospitals.

Given that the stated aim of this body of research was to identify the psychological factors influencing breastfeeding duration, the probable existence of additional related psychological factors not identified by this research should also be considered a limitation. The triangulated nature of the larger research design allowed for the consideration of multiple sources of information related to the psychological determinants of breastfeeding to be included in Phase 2. These included the qualitative insights provided by mothers and breastfeeding professionals in Phase 1, in addition to the extant literature. However, practical considerations meant that only a small proportion of these factors could be included for measurement and other, unidentified factors may also exist. Future studies may therefore discover important psychological factors not included in this model. It is hoped that the results of this research will prompt further investigations which may extend current knowledge in this potentially important area.

Finally, there were some measurement issues which may have impacted on the results of this research. These included the results regarding the impact of rural or regional residence on the duration of breastfeeding. It is important to note that results regarding women residing in rural or remote communities can only be generalised to women living in these communities who travel from outlying areas to deliver their babies in Toowoomba. Many other rural women deliver their babies in small rural hospitals closer to their homes, and the characteristics of these women and women who travel to Toowoomba to give birth may differ.

Some novel scales were employed in this research to measure constructs not previously explored in research such as this. These factors included the woman's faith in breastmilk, her breastfeeding expectations, and current life priorities. As this study represents the first recorded attempt to quantify these constructs, results for these scales may be an artefact of measurement difficulties. Further research to confirm the validity and reliability of these instruments and the method used is required. Some previously validated scales used in this research also displayed less than optimal reliability when used in this sample. These included the IPIP Adaptability scale and the Achievement Striving scale. Results for these scales should be interpreted with this flaw in mind.

8.6 Conclusion

In this study, psychological factors hypothesised to influence the duration of breastfeeding were measured in a sample of postnatal women and tested for their relationship to the duration of breastfeeding to 6 months postpartum. Data from this study reveal that breastfeeding rates remain well below national targets, and that approximately 44% of women may suffer from some form of postnatal distress during the first 14 days following the birth. The results also revealed several psychological factors significantly associated with the duration of both Fully and Any breastfeeding including the woman's scores on measures of breastfeeding self-efficacy, optimism, faith in breastmilk, planned breastfeeding duration, anxiety, expectations of breastfeeding and the timing of her infant feeding decision. After statistically removing the influence of all major socio-demographic variables, faith in breastmilk and planned breastfeeding duration remained as significant unique predictors of both Fully and Any breastfeeding duration, and in the case of the duration of Any breastfeeding, breastfeeding self-efficacy was added to this list of unique predictors. This knowledge has implications for both practice and further research, and represents an advance in our ability both to identify women at risk of early breastfeeding cessation, and to construct programs capable of increasing the length of time for which Australian women breastfeed. These implications for clinical practice and future research will be the topic of the concluding chapter of this dissertation.

A little knowledge that acts is worth infinitely more than much knowledge that is idle.

Kahlil Gibran

Chapter Nine: Study Overview and Implications

This, the final chapter of this dissertation, will present a summary of the major findings, implications and conclusions arising from this research. Following a broad introduction to the implications of the study, suggestions for future research will be outlined. These suggestions cover measurement and other research design issues, in addition to suggestions for future research which may strengthen our knowledge of the psychological factors which impact on breastfeeding duration. In the hope that mothers will benefit directly from this study, suggestions for incorporating the findings of this research into clinical practice will then be offered. The dissertation will then conclude with an overview of the study and its relevance to our current understanding of the determinants of breastfeeding duration.

9.0 Introduction

The results of this study hold several important implications for the practice and direction of future research into the determinants of breastfeeding duration. These include several methodological difficulties encountered during the study's progress, knowledge of which may improve the quality of future research in this area. The results of the current project also suggest possible directions for future studies which may increase our existing knowledge of the determinants of breastfeeding. Further research in this area may lead to screening tools and interventions with the potential to assist women in reaching their longer term breastfeeding goals. At a clinical level, this project also has several implications for health professionals who work with breastfeeding women, who may find the enhanced knowledge of the psychological environment of breastfeeding women of use in their practice. Many of these implications have been introduced in the preceding text, and will therefore be discussed briefly in the section which follows.

9.1 Research Implications

9.1.1 Measurement Issues

Some measurement issues arose in Phase 2 of this study which may usefully inform future researchers in this area. These include the tendency for participants to report their baby as being fed "breastmilk only", when in fact they had also introduced solids to the baby's diet. Though this was not confirmed, discussions with participants during data collection suggested that many women did not consider the introduction of solids to be of much consequence, leading them to focus instead on avoiding introducing formula to their baby. This suggests that it is important to ask mothers specific questions regarding the timing of the introduction of solid foods in order to accurately categorise infants into feeding methods. This is particularly important to the accurate measurement of Fully or Exclusive breastfeeding. Comprehensive guidelines for data collection in breastfeeding research are now available, including questions on the addition of numerous specific foods to the baby (Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003; WHO, 1991). The current results highlight the importance of careful use of guidelines such as these.

Also, some scales used to measure psychological variables in Phase 2 did not perform well in this research and alternative instruments may need to be identified or developed which are more suited to the postnatal period. Two of these previously validated instruments including the Achievement Strivings scale (Spence, Helmreich, & Pred, 1987) and the IPIP Adaptability scale (Goldberg et al., 2006) were not statistically reliable measures of the constructs under investigation when used in this study. Given their previously reported reliability, the poor performance of these instruments in the current research may be due to some characteristic of the sample, or of postnatal women in general. The results of Phase 1 and some previous studies (Bulk-Bunschoten, van Bodegom, Reerink, Pasker-de Jong, & De Groot, 2001; Rentschler, 1991; Vandiver, 1997) suggest that achievement striving and adaptability of postnatal women may contribute to the prediction of breastfeeding duration. Future researchers are therefore encouraged to seek out or develop instruments which are reliable and valid measures of these constructs.

Further research is also required to develop valid and reliable measures of the novel constructs arising from the results of Phase 1. Translating descriptive qualitative data into a definable and measurable form represents a challenge to

research such as this, and more work is needed before conclusions regarding the impact of these factors on breastfeeding duration can be drawn. This difficulty may have influenced the results arising from measures chosen to determine the effect of the most important psychological factor nominated by the Phase 1 groups. As this study represents the first attempt to measure this construct, it is possible that the non-significant results on these measures reflect not a lack of any statistical relationship between this factor and breastfeeding duration, but rather an inability to adequately describe and validly measure it. Future researchers may wish to explore the operational definition and measurement of this construct further.

9.1.2 Faith in Breastmilk

Another measure which warrants further research is the novel Faith in Breastmilk scale. In this study, the Faith in Breastmilk scale uniquely predicted the duration of breastfeeding to 6 months postpartum. Given the brevity and ease of administration of this two-item, self-report scale, it may be a useful addition to future instruments designed to identify women at risk of early breastfeeding cessation for additional support and follow-up. Though it is beyond the scope of the current study, the current data may also be used to further investigate the properties of this scale in a subsequent analysis.

9.1.3 Planned Breastfeeding Duration

An additional area requiring further research arises from the study's identification of the woman's planned breastfeeding duration as a key determinant of the length of time for which she will breastfeed. Given the strong relationship between planned and actual time of weaning, research aimed at identifying the factors which result in the decision to wean early is warranted. Studies designed to determine if planned breastfeeding duration can be modified to enhance breastfeeding duration through targeted interventions are also needed. Research into interventions to increase breastfeeding duration should also take into account other results of this study including the relationship between breastfeeding duration and the mother's confidence in her ability to breastfeed, or breastfeeding self-efficacy.

9.1.4 Breastfeeding Self-Efficacy

In Phase 1 breastfeeding self-efficacy ranked number five among the most important psychological factors influencing breastfeeding duration. Statistical analysis conducted in Phase 2 then identified the woman's scores on the BSES-SF

(Dennis, 2003) as significantly associated with the duration of both Fully or Any breastfeeding. BSES-SF score also arose as a unique predictor of Any breastfeeding duration, such that every one-point increase in BSES-SF score increased the woman's likelihood of continuing to breastfeed by approximately 5% (score range 14-70). Numerous other authors have reported that women who scored higher on the BSES (or the modified BSES-SF) breastfed for longer than women with low scores (e.g., Baghurst et al., in press; Blyth et al., 2002; O'Brien & Fallon, 2005). The evidence for a strong positive relationship between breastfeeding duration and breastfeeding self-efficacy is therefore mounting. Recent research into interventions aimed at increasing breastfeeding self-efficacy shows promise (Noel-Weiss, 2006a, 2006b; Noel-Weiss & Hebert, 2004), but more needs to be done to progress this potentially important research further (Ertem, Votto, & Leventhal, 2001).

9.1.5 Depression, Anxiety and Stress

This study's findings with regard to depression, anxiety and stress in the sample also hold implications for future research. While it is important to note that a clinical interview is required to accurately diagnose these states in individuals (Lovibond & Lovibond, 1995), results on the self-reported DASS-21 in this sample provided some interesting information. Firstly, depression was not associated with the duration of breastfeeding, but anxiety was. This lack of an association between depression and breastfeeding duration is contrary to the findings of many previous researchers who used different measures of depression such as the EPDS (e.g., Henderson, Evans, Straton, Priest, & Hagan, 2003; Tammentie, Tarkka, Åstedt-Kurki, & Paavilainen, 2002). Secondly, participants reported more symptoms of anxiety than they did depression, and stress was also commonly reported in the sample. Many women (35%) reported co-morbid symptoms of two or all of these states. This suggests that anxiety and stress may play a larger role in postnatal psychological distress than is currently thought. Given these results it is possible that the continued focus on depression as the defining symptom of postnatal psychological distress may limit our understanding of this distressing and potentially damaging postnatal condition.

This contention is backed by research which suggests that the EPDS (Cox & Sagovsky, 1987), which appears to be the most commonly used self-report measure of postnatal depression, correlates strongly with measures of both depression and

anxiety (Brouwers, van Baarb, & Pop, 2001; Stuart, Couser, Schilder, O'Hara, & Gorman, 1998). Some past authors have also suggested that the term "postnatal depression" inadequately describes the experience of psychological distress in postnatal women (Miller, Pallant, & Negri, 2006). Coupled with the current results, this suggests that further research investigating the features of postnatal psychological distress may be required. If meaningful differences are found between postnatal psychological distress and depression experienced at other times, more consistent adoption of the term "postnatal distress" may be warranted to remove the existing emphasis on symptoms of depression as signalling psychological distress in the postpartum. Universally adopted operational definitions of postnatal distress would improve the ability to compare research findings, and allow for the development and evaluation of treatment methods which take into account the multi-faceted nature of the disorder, the specific challenges of early motherhood, and the social and cultural forces surrounding women. Diagnostic criteria should also be developed which more accurately reflect the complex, multifaceted nature of postnatal distress in women (Ross, Gilbert-Evans, Sellers, & Romach, 2003). The addition of these criteria to diagnostic manuals such as the DSM and ICD may facilitate diagnosis and enhance understanding of the course and features of postnatal distress. In the interim, the use of both the EPDS and the DASS-21 in research and clinical settings may provide a more comprehensive picture of psychological distress in postnatal women.

9.1.6 Psychological Variables as Predictors of Breastfeeding Duration

Finally, the results of this research provide support for the contention that psychological variables are important predictors of breastfeeding duration. Statistical measures of the strength of association showed that the set of psychological variables were almost twice as strongly associated with Fully breastfeeding duration than the socio-demographic set (.08 compared to .17) and more than twice as strongly associated with Any breastfeeding duration (.15 compared to .29) than the socio-demographic factors. Unique predictors of breastfeeding duration were also identified among the psychological factors. These results represent an advance in our ability to construct an actuarial tool capable of reliably predicting the duration of breastfeeding. This may be a key area for future research, particularly given the

important practical and economic advantages that may arise from an enhanced ability to identify women at risk of early weaning.

9.2 Clinical Implications

Further opportunities to increase breastfeeding duration may arise from investigating strategies which may be used by women to help them to cope with the challenges inherent in breastfeeding. While more research is needed to confirm the efficacy of strategies put forward by Phase 1 participants to enhance coping and increase breastfeeding duration, these may represent a good starting point for identifying behaviours which may be helpful to breastfeeding women. These included gaining a good knowledge of breastfeeding early in the pregnancy, taking time to prepare yourself psychologically for motherhood, recognising the importance of solving early problems, actively solving problems and utilising available supports, taking time out to relax and look after yourself, and the use of mindfulness, cognitive reframing and positive self-talk. While their efficacy is not confirmed, clinicians may find that these are useful suggestions to women seeking strategies to help them to manage the challenges of breastfeeding.

The enhanced knowledge of the predictors of breastfeeding duration gained through Phase 2 may also be immediately useful to clinicians. While much work is still to be done before the role of these psychological factors in breastfeeding duration is confirmed, simple awareness of the possible impact of these factors on breastfeeding duration may be an advantage to clinicians. This knowledge may enhance understanding of the multiple and complex psychological factors influencing breastfeeding women, and assist clinicians in identifying the needs of breastfeeding women in their care. Uniquely predictive psychological factors including the woman's faith in breastmilk, planned breastfeeding duration and breastfeeding self-efficacy may be of particular interest, and may enhance the ability of clinicians to channel limited health service resources to those women who need them most.

In fact, discussion of the psychological factors which were associated with the duration of breastfeeding in these studies may also be of direct benefit to mothers. Qualitative data arising from this research suggests that women would like more antenatal education regarding possible breastfeeding problems and challenges, and this includes the psychological challenges which may impact on infant feeding.

Phase 1 women who weaned early believed that targeted psychological preparation for breastfeeding and motherhood may also have positively influenced their breastfeeding duration. Discussion of the psychological factors influencing breastfeeding duration raised in these two studies may be incorporated into antenatal infant feeding education to better prepare women for their infant feeding experience. These data suggest that antenatal classes should also incorporate a more realistic approach to the range of physical problems which may be experienced by breastfeeding women such as attachment, supply and nipple problems.

A need for further education regarding the introduction of solid foods to infants is also indicated by the results of this study. Almost one in every three women who continued to breastfeed to 6 months in this sample introduced solids earlier than the recommended 6 months of age. Moreover, many of the participants seemed unaware of the impact of this decision on the child's health. Given the relative recency of the announcement of revised guidelines for feeding solid foods to infants (NHMRC, 2003), it may be that many women are unaware of these changes and therefore continue to follow the outdated guidelines. Health professionals working with mothers and babies should be regularly updated on research findings and current infant feeding guidelines, and outdated literature should be discarded and swiftly replaced by accurate printed information to avoid confusion. Also, the new guidelines and the reasons for these changes should be communicated to women clearly. These may be accompanied by strategies to delay the introduction of solids where indicated, such as the management of normal appetite increases in the baby. Research identifying appropriate educational interventions and any barriers to the implementation of these new guidelines is also required. However, in the interim clinicians should consider the woman's right to make an informed choice regarding the timing of the introduction of solid foods to her baby.

Qualitative data arising from this research suggests that clinicians should also be mindful of the effect of the social and cultural forces influencing new mothers. Participants from both studies reported feeling significant social pressure to breastfeed. This was distressing for many women, and some artificially feeding women believed that this pressure resulted in feelings of failure because they were not breastfeeding. This was accompanied by feelings of guilt in some artificially feeding mothers in Phase 1, while the breastfeeding mothers in this study reported feeling pride in their infant feeding method. However, social pressures were not

restricted to artificially feeding women and some breastfeeding women spoke of experiencing disapproval of breastfeeding in public places, and social and health professional pressure to wean older babies (some under 6 months old). These pressures add to the already significant challenges faced by new mothers. The clinician's role is important in supporting the woman in her mothering role whatever her infant feeding method, and in referring women to appropriate counselling or support services should they be required.

9.3 Overview and Conclusion

In concluding this chapter it may be useful to take a final, broader view of the psychological and psycho-social environment of motherhood, and attempt to place the current findings within this broader context. Regardless of infant feeding method, it seems that most postnatal women are faced with a period of rapid change and adjustment as they face the transition to a new mothering role (Mercer, 2004). Often, women must also cope with added physical and emotional demands in terms of recovering from the birth, associated hormonal changes, fatigue, sleeplessness, and shifts in her relationships and in her identity as a woman and a mother (Ruble et al., 1990; Russell, Douglas, & Ingram, 2001). The woman's individual experience is also situated in a complex social environment that incorporates both a strong social construction of maternal morality and a tendency to undervalue motherhood (Wall, 2001). That this postnatal period is psychologically challenging for many women is supported by evidence of poorer than usual mental health at this time (Gjerdingen & Chaloner, 1994), and this study's findings of the prevalence of anxiety, depression and stress in a postnatal sample. In the midst of this demanding time women must also navigate the specific challenges of infant feeding (Cooke, Sheehan, & Schmied, 2003).

The experience of infant feeding appears to vary widely among individuals. In addition to many factors including pre-existing psychological differences, this experience is influenced by differences in the woman's social environment, and her cognitive, emotional and embodied experience of breastfeeding (Schmied & Barclay, 1999). Examples of differences in women's experiences of infant feeding were apparent in the data arising from Phase 1 of this project. In general, breastfeeding women in this study experienced breastfeeding as pleasant and satisfying, while many artificially feeding women found it boring, frustrating and unpleasant. This is

similar to data reported by previous authors (Schmied & Barclay, 1999; Sheehan, Schmied, & Cooke, 2003), and highlights the importance of an individualised approach to infant feeding which takes the woman's social, cognitive, emotional and embodied reactions to breastfeeding into account.

Despite the unique nature of each woman's experience however, the identification of factors which are predictive of the duration of breastfeeding in groups of women is of value. Knowledge of these factors may be of use in identifying those at greatest risk of early breastfeeding cessation, and to form the basis of programs designed to modify high risk variables. The current research clearly demonstrated that socio-demographic factors are not strong predictors of breastfeeding duration when compared to individual psychological differences. These data suggest that individual psychological differences thought to impact on the woman's cognitions, emotions, and somatic experience are also important predictors of her infant feeding behaviour. Phase 1 participants provided many examples of psychological variables which they believed may impact on breastfeeding duration. A total of 46 factors related to the woman's psychology were thought to influence breastfeeding duration by the groups, demonstrating the rich and complex psychological environment impacting on new mothers. The top five "most important" factors raised by these groups included the woman's priorities as a mother and mothering self-efficacy; faith in breastmilk; adaptability; stress; and breastfeeding self-efficacy.

Taking into account these Phase 1 data and the extant literature, 15 psychological variables were selected for inclusion in Phase 2. Of these, eight variables including self-esteem, psychological reactance, adaptability, achievement striving, depression, stress, the mother's priorities and mothering self-efficacy were not statistically associated with the duration of breastfeeding, and were excluded from further analyses. The remaining seven psychological variables including optimism, breastfeeding self-efficacy, faith in breastmilk, breastfeeding expectations, anxiety, time of feeding decision and planned duration of breastfeeding were significantly related to the duration of breastfeeding. Data for these variables showed that women who scored higher on measures of dispositional optimism or breastfeeding self-efficacy were likely to breastfeed for longer than those with lower scores. Women were also likely to breastfeed for longer if they had more faith in breastmilk and less faith in formula compared to others in the sample. Shorter

breastfeeding durations were associated with women who had high scores on a measure of anxiety, women who did not make the decision to breastfeed until after their baby was born, and women who planned to breastfeed for less than 6 months. Shorter breastfeeding durations were also found among women who reported their belief that breastfeeding would be hard for them when asked in the first 14 days postpartum, though this result may not accurately reflect the construct of breastfeeding expectations given the timing of the questionnaire's delivery.

Eleven socio-demographic variables were also tested for their relationship with breastfeeding duration including the mother's age, years of education, usual occupation, rural or regional residence, parity, intent to return to full time work, intent to return to part time work, previous breastfeeding experience, the hospital at which the birth occurred, and the infant feeding preferences and usual occupation of her partner. Of these, five socio-demographic variables were statistically associated with the duration of breastfeeding, such that longer breastfeeding durations were found in older, or more educated mother's, women who were usually employed in professional or associate professional occupations, women with 6 weeks or more of previous breastfeeding experience, and women whose partner preferred breast over formula feeding.

As a set, the socio-demographic variables significantly predicted the duration of Any (X^2 (5) = 49.51, p = .000) or Fully (X^2 (5) = 26.98, p = .000) breastfeeding. However, the strength of association between the set of socio-demographic variables and breastfeeding duration was relatively weak (Any breastfeeding R^2 = .15, and Fully breastfeeding R^2 = .08). Predictive capacity was significantly increased by inclusion of the psychological variables at Step 2 of the analysis (Step 2 change for Any breastfeeding X^2 (7) = 90.62, p = .000, Fully breastfeeding X^2 (7) = 54.78, p = .000). After adjustment for the socio-demographic variables, the set of psychological variables was more strongly associated with the duration of breastfeeding than was the socio-demographic set (Any breastfeeding R^2 = .29, Fully breastfeeding R^2 = .17). These data suggest that the psychological factors in the design were more predictive of breastfeeding duration than the socio-demographic variables which have been more commonly relied upon to predict the early cessation of breastfeeding in the past. This study also provides support for previous research which has found a relationship between breastfeeding duration and the woman's breastfeeding self-efficacy, anxiety, planned duration of breastfeeding or time of breastfeeding

decision. The study's novel findings with regard to the significant relationship between breastfeeding duration and the woman's dispositional optimism, and faith in breastmilk will also be of interest to future researchers.

The final step in the Phase 2 analysis identified those variables in the set which were able to predict the duration of breastfeeding after adjusting for all other variables in the design. For Any breastfeeding, scores on measures of the woman's faith in breastmilk or breastfeeding self-efficacy, and knowledge of her planned breastfeeding duration each uniquely predicted breastfeeding duration. Fully breastfeeding duration could be uniquely predicted by two of these variables, being faith in breastmilk and planned breastfeeding duration. These results demonstrate the importance of these variables over and above the influence of other important factors which impact on her breastfeeding behaviour, such as the preferences of her partner and her previous breastfeeding experience.

The results of Phase 2 therefore confirm that psychological factors are important predictors of the duration of breastfeeding, and that some of these can be successfully measured in postnatal women using existing instruments such as the BSES-SF and the LOT-R. These results also confirm once again the importance of breastfeeding self-efficacy in determining breastfeeding duration, and may encourage further research aimed at designing an intervention capable of increasing breastfeeding self-efficacy in mothers. Likewise, the importance of the mother's plans for the duration of breastfeeding were confirmed by these results, suggesting that further research is required to determine if this factor can be modified through intervention. The woman's faith in breastmilk as compared to her faith in formula was also an important predictor, and may encourage further studies to explore the origins and meaning of this faith, and its potential for modification.

In conclusion, this research aimed to identify and explore individual psychological differences between women which influence the duration of breastfeeding. The triangulated nature of the study design has allowed for the inclusion of both qualitative and quantitative data in meeting this aim. This mixture of research approaches provides not only two differing sources of evidence, but also an opportunity to broaden our understanding of the complex psychological environment of new mothers. Every individual woman approaches breastfeeding from a psychological reality that is as unique and complex as they are themselves. It is hoped that this research investigating individual psychological differences among

mothers will be of assistance in strengthening our ability to understand and support Australia's breastfeeding women.

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Appendix A

Definition of Key Terms

Breastfeeding Intensity

The following definitions are based on those proposed by the Australian Food and Nutrition Monitoring Unit for use in breastfeeding research in Australia (Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003). These were heavily influenced by the definitions proffered by the World Health Organisation (WHO, 1991), and have been adopted by many researchers.

Table A

Definitions of Breastfeeding Intensity used in this Research

Infant Feeding Category	Requires	Allows	Does not allow
Exclusive breastfeeding (EBF)	Breast milk, including expressed breast milk (EBM) and breastmilk from a wet nurse	Drops, syrups (vitamins, minerals, medicines)	Anything else
Predominant breastfeeding (PBF)	Breast milk, including EBM and breastmilk from a wet nurse as the predominant source of nutrition	Liquids (water and water-based drinks, fruit juice, ORS); ritual fluids and drops or syrups (vitamins, minerals, medicines)	Anything else (in particular, non-human milk, food-based fluids)
Full breastfeeding (FBF)	Breast milk, including EBM and breastmilk from a wet nurse	Substances specified for EBF or those specified for PBF	Anything else (in particular, non-human milk, food-based fluids)
Complementary breastfeeding (CBF)	Breast milk and solids or semisolids foods or non-human milk	Any food or liquid including non-human milk, as well as breast milk	Breast milk, including EBM and breastmilk from a wet nurse

Table A (cont.)
Definitions of Breastfeeding Intensity used in this Research

Infant Feeding Category	Requires	Allows	Does not allow
Artificially feeding. (AF) Non-breastfeeding	No breast milk	Any food or liquid including non-human milk.	
Breastfeeding ("Any breastfeeding")	Breast milk	Any food or liquid including non-human milk, as well as breast milk	

Note. Table based on those provided by the World Health Organisation (WHO, 1991) and the Australian Food and Nutrition Monitoring Unit (Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003).

In Phase 2, the infant feeding methods of participants are firstly reported in the categories "Fully breastfeeding", "Complementary breastfeeding" and "Artificially feeding" to facilitate comparison of breastfeeding rates across studies. Phase 2 statistical analyses were performed twice, firstly to assess the relationship between the factors under consideration and the duration of "Fully breastfeeding", and secondly to assess the relationship between these factors and the duration of "Any breastfeeding". The term "Any breastfeeding" used in this research is synonymous with the World Health Organisation's "Breastfeeding" category, which requires only that the infant's diet includes breastmilk (WHO, 1991).

Other Terms Used

To promote consistency, other infant feeding terms used in this research are defined according to the guidelines provided by the Australian Food and Nutrition Monitoring Unit (Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003), which are outlined below.

Breastfeeding Duration

The total length of time for which an infant receives any breastmilk at all – from initiation through until weaning is complete. Breastfeeding duration was calculated in this study using the number of weeks from birth to the time of weaning, with days rounded to the nearest week or half week.

Breastmilk

Human milk and colostrum.

Breastmilk Substitute

Any milk or food based fluid (other than breastmilk), used in infant feeding as a replacement for breastmilk, whether or not it is suitable for that purpose.

Multiparous

Describes women who have experienced one or more previous births.

Primiparous

Describes women bearing their first child.

Solid foods

Any solid or semi-solid foods (e.g., dilute infant cereals). Does not include breastmilk or breastmilk substitutes, fruit and vegetable juices, sugar water, and so forth.

Weaning

The period during which infants are introduced to breastmilk substitutes and/or solid foods with the intention of replacing breastmilk in the diet.

Weaned

The infant or child no longer receives any breastmilk (at all; Webb, Marks, Lund-Adams, Rutishauser, & Abraham, 2003).

Appendix B

Phase 1 HP Group Questionnaire

Psychology of Breastfeeding Pilot

Thanks for your time, please try to choose a single answer for each question.

Your ID code (from the consent form): _____

Today's date: _____

What is your Occupation? _____

How many years have you worked with breastfeeding mothers in a clinical capacity? _____

Previously, many breastfeeding clinicians have told us that after working with breastfeeding mothers for some time, they developed a degree of 'clinical insight' which allows them to predict with some accuracy which mothers will breastfeed successfully, and which will struggle.

Do you believe you have also developed this insight *(please circle)***?**

Yes

No

If yes, how often would you expect your prediction to be accurate *(please circle)***?**

1. **100% of the time**
2. **75% of the time**
3. **50% of the time**
4. **25% of the time**
5. **Less than 25% of the time**

Thank you for completing this questionnaire. Please bring it to USQ when you attend the group meeting. I look forward to seeing you then,

Maxine (Ph. 4631 1993)

Appendix C

Phase 1 Questionnaire (FBF/CBF/AF Groups)

Psychology of Breastfeeding Pilot

Thanks for your time, please try to choose a single answer for each question.

Your ID code (from the consent form): _____

1 Today's date: _____

2 What is your home postcode? _____

3 What was your youngest baby's date of birth:_____

4 What is the sex of your youngest baby: Boy □ Girl □

5 What is your current marital status?

1. Married or living with a partner □
2. Single or not living with a partner □
3. Other (please specify) □

If you have a partner please answer these questions, others please proceed to Q8.

About your partner -

6 What is their occupation *(please be as specific as you can)*

_____

7 How many years of formal education did they complete? *(including school years 1 to 12, apprenticeships, college, diploma programs and/or university)* _____

About you -

8 How old are you? _____

9 What is your usual occupation? *(please be as specific as you can)* _____

_____

10 How many years of formal education did you complete? *(including school years 1 to 12, apprenticeships, college, diploma programs and/or university)*

_____

11 In what country were you born? _____

12 Do you smoke cigarettes (at all)? Yes □ No □

13 Are you in paid employment?

1. No paid work at the moment □
2. I went back to *full time work* when this baby was _____ months old
3. I went back to *part time work* when this baby was _____ months old
4. Other (please specify) _____

14 When did you decide how you wanted to feed this baby?

1. Before this pregnancy □
2. During this pregnancy □
3. After the birth □

15 When you made your feeding decision, how long did you plan to breastfeed for? *(please specify a time in weeks, months or years)*

_____

16 Did your mother successfully breastfeed?

1. Yes □
2. No □

17 Who is the one person *(excluding yourself)* **whose opinion matters most to you regarding how you feed your baby?**

1. My partner □
2. My mother □
3. Other *(please specify)* _____

18 On a scale of 1 to 7, how would you rate this person's attitude toward feeding methods for this baby?

1. Strongly prefers breastfeeding □
2. Moderately prefers breastfeeding □
3. Slight preference for breastfeeding □
4. Has no preference in feeding method □
5. Slight preference for formula feeding □
6. Moderate preference for formula feeding □
7. Strong preference for formula feeding □

19 Is this your first live baby?

1. Yes *(go to Q21)* □
2. No □

20 Did you breastfed your earlier children?

Child 1	yes □	no □	duration _____
Child 2	yes □	no □	duration _____
Child 3	yes □	no □	duration _____
Child 4	yes □	no □	duration _____

21 How are you feeding your baby now?

1. Breastmilk only (no solids or formula) □
2. Formula and/or solids (no breastmilk) □
3. Some breastmilk plus solids (no formula) □
4. Some breastmilk and some formula (with or without solids) □

For those who have introduced formula or solids -

22 How old was your baby when you first introduced regular solids? *(in weeks)* _____

23 How old was your baby when you first introduced regular formula? *(in weeks)* _____

24 How old was your baby when you stopped breastfeeding (at all)? *(in weeks)* _____

Thank you for completing this questionnaire. Please now return it to USQ in the reply paid envelope provided. I look forward to meeting you when you attend the group meeting. ***Maxine (Ph. 4631 1993)***

Appendix D

Phase 1 Meeting Agenda

THE NOMINAL GROUP TECHNIQUE

1. **Silent generation of ideas in writing (5-10 mins.)**

Members are asked to spend 5 minutes listing their ideas in response to the research question, which will first be read aloud, and then made available in written form. Ideas should be in brief phrases, and written in the order in which they are generated on the paper provided. Members are asked to work silently and independently.

2. **Recorded round-robin listing of ideas on chart (20-40 mins)**

Each group member is asked to read one of her ideas in turn, with the scribe writing each idea on a flip chart as it is read. All ideas are assigned a number, and recorded as presented without discussion. If one of your ideas is brought up by another group member before you mention it, put a cross beside it and move on to the next one. The procedure continues around the table enough times for each group member to complete her list.

3. **Discussion of each idea for clarification and evaluation. (30-50 mins)**

Each idea on the chart is discussed in order. The leader reads each aloud in turn, and asks the group for questions, statements or clarification, or any statements of agreement or disagreement members would like to make. This section is audiotaped.

4. **Vote on priorities: silent, independent (5-10 mins)**

The leader reads the question aloud again, and asks the group members to select from the entire list, the 7 most important factors identified. Members are asked to rate the factors from no importance (1) to high importance (10) on the ratings sheet provided. It is possible to have one or more factors of equal importance.

Morning/Afternoon Tea

The group leader (or scribe) will collect the rating sheets and add the group's cumulative rating for each item during this time. They will be presented on the whiteboard in time for the final step.

5. **Presentation of group consensus and final discussion (10-20 mins)**

The cumulative ratings for each item are presented to the group for discussion. The purpose of this discussion is for clarification, specifically to:

- examine inconsistent voting patterns, and
- provide for opportunity to discuss again, any items which are perceived by members of the group as receiving too many or too few votes.

This section is audiotaped.

Appendix E

Phase 1 Rating Form

Participant ID No. _____

No. from flip chart	Item description	Relative importance *Important* *Extremely important*
		1 2 3 4 5 6 7 8 9 10 *Please circle one number only*
		1 2 3 4 5 6 7 8 9 10 *Please circle one number only*
		1 2 3 4 5 6 7 8 9 10 *Please circle one number only*
		1 2 3 4 5 6 7 8 9 10 *Please circle one number only*
		1 2 3 4 5 6 7 8 9 10 *Please circle one number only*
		1 2 3 4 5 6 7 8 9 10 *Please circle one number only*
		1 2 3 4 5 6 7 8 9 10 *Please circle one number only*

Instructions

1. Choose the seven most important factors from the flip chart.
2. List them in the boxes above, using the number and the description from the flip chart.
3. Rate each item in terms of its importance to breastfeeding duration, with 1 being important, and 10 being extremely important. Two or more items can have the same rating if you feel they are equally important.

Appendix F

Phase 1 Plain Language Statement and Consent Form

The Psychology of Breastfeeding - Consent Form

The Centre for Rural and Remote Area Health (CRRAH) at the University of Southern Queensland are conducting a study into the psychological factors that influence the length of time that mothers breastfeed their babies for. We hope that increasing our knowledge of these factors during the course of this research will help both in the identification of mothers at risk of early weaning, and in the future planning of programs aimed at increasing the length of time that mothers breastfeed.
As an individual with valuable experience and expertise in this area, you are being asked to participate in the initial pilot study, which aims to identify what the most important psychological factors are, and therefore what needs to be included in Study 2, which will be undertaken in 2005.

If you consent, your involvement will begin with the completion of the initial 3-page questionnaire (approximately 10 minutes). Following this, you will be asked to agree on a time to come to the CRRAH conference room at USQ (map attached) and participate in a group meeting. These groups will take between 2 and 3 hours to complete (including morning or afternoon tea), and will be attended by 5 to 9 members, all of whom will have had a similar experience of breastfeeding to your own. There are four slightly differing groups of breastfeeding 'experts' being studied, and the group we have identified you as belonging to is –

1. Mothers who have exclusively breastfed this baby (with no other regular foods or fluids) for a minimum of 6 months.
2. Mothers who have partially breastfed this baby for a minimum of 6 months (i.e. mostly breastmilk plus solids or formula comps introduced before 6 months).
3. Mothers who started to breastfeed this baby, but weaned off the breast and on to formula (with or without solids) before 6 months.
4. Currently practicing Lactation Consultants, midwives and breastfeeding counsellors with extensive experience of working with breastfeeding women..

Important note:
* While we appreciate the difficulty in finding child care for your baby, USQ health and safety policies mean that we must ask that you attend the group without children if at all possible. Evening or weekend groups may be arranged if this is more convenient to the majority.

Participation is entirely voluntary, and you are free to withdraw from the study, or to withdraw your data from the study at any time with no questions asked and without consequences. The results of the study will be reported in a PhD dissertation being conducted by Maxine O'Brien, and it is hoped that the findings will also be published in a psychology or nursing journal. You can be assured that no personal information will be published that may allow you or your baby to be identified as a participant.

If you agree to take part in the study, please sign the consent form below. This consent form and all identifying information will be kept separately from the data that you provide, which will employ participant ID codes to protect your privacy. Study materials will be kept in a secure location for a period of five years, after which they will be shredded and disposed of as confidential waste. Complaints or concerns regarding the ethical conduct of this project can be directed to the Secretary of the USQ Human Research Ethics Committee on 4631 2956.

If you have any questions about this research project, please contact the researcher, Maxine O'Brien on 4631 1993, or 0408 788 225.

CONSENT FORM

I have read and understood the information provided and agree to take part in the breastfeeding study. I understand that my participation is entirely voluntary and that I may withdraw my participation and/or my data at any time with no questions asked. I understand that the results of the study will be reported in a PhD dissertation and journal articles, and that I will not be identified in any publication resulting from this research. I understand that a numbering system will be used to ensure that my name and other personal details are not kept with my study responses.

Name: _____

Signature: _____ Date: _____

Witness: _____ Date: _____

PARTICIPANT ID NUMBER: _____

Thank you; please return this consent form page with your completed questionnaire.

Appendix G

Phase 2 Questionnaire

Infant Feeding Study

Thanks for your time, if you have any questions or problems while completing this please contact Maxine on 0408 788 225. Try not to spend too long on any one question, but choose a single answer for each.

Date ☐☐ / ☐☐ / ☐☐ **ID No (office use only)** ☐☐☐☐

Baby's date of birth ☐☐ / ☐☐ / ☐☐ ☐ **Boy**

Mother's Home Postcode ☐☐☐☐ **Sex of the baby** ☐ **Girl**

Section One: Background Information

1.1 What is your marital status? ☐ 1 Married or de facto
☐ 2 Single or not living with a partner
☐ 3 Other ☐☐☐☐☐☐☐☐☐☐

1.2 In what year were you born? ☐☐☐☐

1.3 How many years of formal education have you had? *(including completed school years 1 to 12, apprenticeships, college, diploma programs and/or university)* ☐☐

1.4 What is your usual occupation? *(please be as specific as you can)*

1.5 What is your partner's usual occupation (if applicable)? *(please be as specific as you can)*

1.6 What are your plans with regard to *full time* employment after this baby?

☐ 1. No plans to take on full time paid work at the moment
☐ 2. I will go back to full time work when my baby is 6 weeks old or less
☐ 3. I will go back to full time work before my baby is 3 months old
☐ 4. I will go back to full time work when my baby is 3-6 months old
☐ 5. I will go back to full time work when my baby is 6-12 months old
☐ 6. If I go back to full time work, it won't be until my baby is over 12 months old

1.7 What are you plans with regard to *part time* employment after this baby?

☐ 1. No plans to take on part time paid work at the moment
☐ 2. I will go back to part time work when my baby is 6 weeks old or less
☐ 3. I will go back to part time work before my baby is 3 months old
☐ 4. I will go back to part time work when my baby is 3-6 months old
☐ 5. I will go back to part time work when my baby is 6-12 months old
☐ 6. If I go back to part time work, it won't be until my baby is over 12 months old

1.8 When did you decide how you wanted to feed this baby?

- ☐ 1. Before this pregnancy
- ☐ 2. Early in this pregnancy
- ☐ 3. Late in this pregnancy
- ☐ 4. After the birth

1.9 Which infant feeding method did you choose?

- ☐ 1. Breastfeeding
- ☐ 2. Formula feeding
- ☐ 3. Some of each

1.10 How long do you plan to breastfeed for? *(please specify a **maximum time** and days, weeks, months or years)*

1.11 If you had a multiple birth this time, how many babies did you have? ☐

1.12 If you are living with a partner, how would you rate his/her attitude toward feeding methods for this baby?

- ☐ 1. Strong preference for breastfeeding
- ☐ 2. Moderate preference for breastfeeding
- ☐ 3. Slight preference for breastfeeding
- ☐ 4. Has no preference for feeding method
- ☐ 5. Slight preference for formula feeding
- ☐ 6. Moderate preference for formula feeding
- ☐ 7. Strong preference for formula feeding

1.13 Is this your first live baby?

- ☐ 1. Yes (go to 2.1)
- ☐ 2. No

1.14 Have you attempted to breastfeed in the past?

Child 1	☐ **yes**	☐ **no**	**Child 3**	☐ **yes**	☐ **no**
Child 2	☐ **yes**	☐ **no**	**Child 4**	☐ **yes**	☐ **no**

1.15 If yes, approximately how many *weeks* did you breastfeed for?

Child 1 ☐

Child 2 ☐

Child 3 ☐

Child 4 ☐

Please answer this question in weeks (e.g. 1 year = 52 weeks)

Section Two: Feeding Information

2.1 How are you feeding your baby now?

☐ 1. Breastmilk only (go to Section 3)

☐ 2. Some breastmilk and some formula (go to Q2.2)

☐ 3. Formula only (go to Q2.4)

FOR THOSE CURRENTLY FEEDING WITH SOME BREASTMILK AND SOME FORMULA:

2.2 If you are feeding your baby some breastmilk and some formula, approximately how many bottles of formula (or water) does your baby have -

Per day? ☐ **OR** Per week? ☐

2.3 If you are feeding your baby some breastmilk and some formula, how old was your baby when you first introduced formula? *(in days)* ☐

FOR THOSE CURRENTLY FEEDING WITH FORMULA ONLY:

2.4 If you are feeding your baby formula only, did you attempt to breastfeed this baby?

☐ 1. yes

☐ 2. no

2.5 If so, how long did you exclusively breastfeed for (breastmilk only)? *(in days)* ☐

2.6 How long did you partially breastfeed for (some breastmilk, some formula)? *(in days)* ☐

Section Three: Measures and Scales

In the following pages, we will ask you questions about your beliefs, your preferences and your experiences. The scales come with between 4 and 6 options to choose from, with the higher value or level of agreement always in the same direction (right). Some scales also come with instructions that apply just to that set of questions, so please read the questionnaire carefully. There are no right and wrong answers and your responses will be kept strictly confidential, so be as honest as you can. Don't spend too long on any one question and please try to answer each one.

Please select a single response for each question throughout

	Strongly Disagree	Disagree	Agree	Strongly Agree
3.1 I feel that I am a person of worth, at least on an equal plane with others	☐	☐	☐	☐
3.2 I feel that I have a number of good qualities.....	☐	☐	☐	☐
3.3 All in all, I am inclined to feel that I am a failure.....	☐	☐	☐	☐

	Strongly Disagree	Disagree	Agree	Strongly Agree
3.4 I am able to do things as well as most other people	☐	☐	☐	☐
3.5 I feel I do not have much to be proud of	☐	☐	☐	☐
3.6 I take a positive attitude toward myself	☐	☐	☐	☐
3.7 On the whole, I am satisfied with myself	☐	☐	☐	☐
3.8 I wish I could have more respect for myself	☐	☐	☐	☐
3.9 I certainly feel useless at times	☐	☐	☐	☐
3.10 At times I think I am no good at all	☐	☐	☐	☐

Please be as honest as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.
Please choose a single response to each statement.

	Disagree completely	Disagree	Neither agree nor disagree	Agree	Agree completely
4.1 Regulations trigger a sense of resistance in me	☐	☐	☐	☐	☐
4.2 I find contradicting others stimulating	☐	☐	☐	☐	☐
4.3 When something is prohibited, I usually think "that's exactly what I am going to do"	☐	☐	☐	☐	☐
4.4 I consider advice from others to be an intrusion	☐	☐	☐	☐	☐
4.5 I become frustrated when I am unable to make free and independent decisions	☐	☐	☐	☐	☐
4.6 It irritates me when someone points out things which are obvious to me	☐	☐	☐	☐	☐
4.7 I become angry when my freedom of choice is restricted	☐	☐	☐	☐	☐
4.8 Advice and recommendations induce me to do just the opposite	☐	☐	☐	☐	☐
4.9 I resist the attempts of others to influence me	☐	☐	☐	☐	☐
4.10 It makes me angry when another person is held up as a role model for me to follow	☐	☐	☐	☐	☐
4.11 When someone forces me to do something, I feel like doing the opposite	☐	☐	☐	☐	☐

The following phrases describe people's behaviours. Please use the rating scale below to describe how accurately each statement describes ***you***. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, then **place a cross in the box that corresponds to how accurately the statement describes you.**

	Very inaccurate	Moderately inaccurate	Neither inaccurate nor Accurate	Moderately accurate	Very accurate
5.1 I am good at taking advice	☐	☐	☐	☐	☐
5.2 I can't stand being contradicted	☐	☐	☐	☐	☐
5.3 I don't tolerate critics	☐	☐	☐	☐	☐
5.4 I adapt easily to new situations	☐	☐	☐	☐	☐
5.5 I put down others' proposals	☐	☐	☐	☐	☐
5.6 I want to have the last word	☐	☐	☐	☐	☐
5.7 I can stand criticism	☐	☐	☐	☐	☐
5.8 I am a bad loser	☐	☐	☐	☐	☐

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer. **Please choose a single answer for each question.**

	Stongly disagree	Disagree	Neutral	Agree	Strongly agree
6.1 In uncertain times, I usually expect the best	☐	☐	☐	☐	☐
6.2 Its easy for me to relax	☐	☐	☐	☐	☐
6.3 If something can go wrong for me, it will	☐	☐	☐	☐	☐
6.4 I'm always optimistic about my future	☐	☐	☐	☐	☐
6.5 I enjoy my friends a lot	☐	☐	☐	☐	☐
6.6 It's important for me to keep busy	☐	☐	☐	☐	☐
6.7 I hardly ever expect things to go my way	☐	☐	☐	☐	☐
6.8 I don't get upset too easily	☐	☐	☐	☐	☐
6.9 I rarely count on good things happening to me	☐	☐	☐	☐	☐
6.10 Overall, I expect more good things to happen to me than bad	☐	☐	☐	☐	☐

Note. Page 6 of the Phase 2 Questionnaire contained the 14-item Breastfeeding Self-Efficacy Scale – Short Form (Dennis, 2003). This copyrighted questionnaire is available on request from the author at cindylee.dennis@utoronto.ca.

Each of the following questions comes with its own set of response options. Please be as honest as you can throughout. there are no "correct" or "incorrect" answers. **Please select a single response for each question.**

8.1 How much does being a mother "stir you into action"?

Much less than others ☐1 ☐2 ☐3 ☐4 ☐5 **Much more than others**

8.2 Nowadays, do you consider yourself to be:

Very hard driving ☐1 ☐2 ☐3 ☐4 ☐5 **Very relaxed and easy going**

8.3 How would your best friends or others that know you well rate your general level of activity?

Too slow ☐1 ☐2 ☐3 ☐4 ☐5 **Very active; should slow down**

8.4 How seriously do you take your work?

Much more than most ☐1 ☐2 ☐3 ☐4 ☐5 **Much less than most**

8.5 How often do you set deadlines or quotas for yourself to do with your mothering or other activities?

Very often ☐1 ☐2 ☐3 ☐4 ☐5 **Almost never**

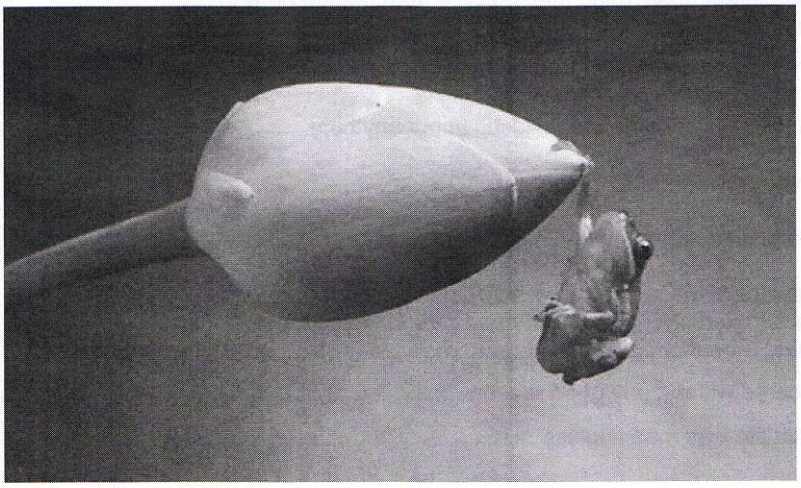
8.6 Compared with other mothers, the amount of effort I put forth is:

Much more ☐1 ☐2 ☐3 ☐4 ☐5 **Much less**

8.7 Compared with other mothers, I approach life in general:

Much more seriously ☐1 ☐2 ☐3 ☐4 ☐5 **Much less seriously**

Hang in there, only three pages to go!



Please read each statement and place a cross in the box under the number 1,2,3 or 4 which indicates how much the statement applied to you ***over the past week*** *(see response key below)*. There are no "right" or "wrong" answers. Don't spend too much time on any statement.

1. Did not apply to me at all.
2. Applied to me to some degree, or some of the time.
3. Applied to me to a considerable degree, or a good part of time.
4. Applied to me very much, or most of the time.

		1	2	3	4
9.1	I found it hard to wind down	☐	☐	☐	☐
9.2	I was aware of dryness of my mouth	☐	☐	☐	☐
9.3	I couldn't seem to experience any positive feeling at all	☐	☐	☐	☐
9.4	I experienced breathing difficulty (eg excessively rapid breathing, breathlessness in the absence of physical exertion)	☐	☐	☐	☐
9.5	I found it difficult to work up the initiative to do things	☐	☐	☐	☐
9.6	I tended to over-react to situations	☐	☐	☐	☐
9.7	I experienced trembling (in the hands)	☐	☐	☐	☐
9.8	I felt I was using a lot of nervous energy	☐	☐	☐	☐
9.9	I was worried about situations in which I might panic and make a fool of myself	☐	☐	☐	☐
9.10	I felt that I had nothing to look forward to	☐	☐	☐	☐
9.11	I found myself getting agitated	☐	☐	☐	☐
9.12	I found it difficult to relax	☐	☐	☐	☐
9.13	I felt down-hearted and blue	☐	☐	☐	☐
9.14	I was intolerant of anything that kept me from getting on with what I was doing	☐	☐	☐	☐
9.15	I felt I was close to panic	☐	☐	☐	☐
9.16	I was unable to become enthusiastic about anything	☐	☐	☐	☐
9.17	I felt I wasn't worth much as a person	☐	☐	☐	☐
9.18	I felt that I was rather touchy	☐	☐	☐	☐
9.19	I was aware of the action of my heart in the absence of physical exertion (eg sense of heart rate increase, heart missing a beat	☐	☐	☐	☐
9.20	I felt scared without any good reason	☐	☐	☐	☐
9.21	I felt that life was meaningless	☐	☐	☐	☐

Please be as honest and accurate as you can throughout and answer all the questions. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer. **Please select one box only in response to each statement**.

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
10.1 I would make a fine model for a new mother to follow in order to learn what she would need to know in order to be a good parent	☐	☐	☐	☐	☐	☐
10.2 The problems of taking care of a baby are easy to solve once you know how your actions affect your baby, an understanding I have acquired	☐	☐	☐	☐	☐	☐
10.3 Being a parent is manageable, and any problems are easily solved	☐	☐	☐	☐	☐	☐
10.4 I meet my own personal expectations for expertise in caring for my baby	☐	☐	☐	☐	☐	☐
10.5 If anyone can find the answer to what is troubling my baby, I am the one	☐	☐	☐	☐	☐	☐
10.6 Considering how long I've been a mother, I feel thoroughly familiar with this role	☐	☐	☐	☐	☐	☐
10.7 I honestly believe I have all the skills necessary to be a good mother to my baby	☐	☐	☐	☐	☐	☐
11.1 If I feed my baby **breastmilk,** I can relax and be sure he/she is getting everything he/she needs	☐	☐	☐	☐	☐	☐
11.2 If I feed my baby **formula,** I can relax and be sure he/she is getting everything he/she needs	☐	☐	☐	☐	☐	☐
12.1 I don't expect to experience any real trouble with breastfeeding, **I think it will be easy for me**	☐	☐	☐	☐	☐	☐
12.2 I expect I will have to work through significant challenges if I am to breastfeed successfully, **I think it will be hard for**	☐	☐	☐	☐	☐	☐

The addition of a new baby to the household generally means there will be times when there seem to be many and varied demands on your time and attention. Please rate the following responsibilities/people with their level of priority for your time over the coming months. Two or more items may attract the same rating, e.g. "cleaning" and "paid work" may be equally important to some women, depending on your circumstrances and preferences. **Please select a single priority rating for each question**.

This is my **Lowest Priority (1)** - through to my **Highest Priority (10)**

	1	2	3	4	5	6	7	8	9	10
13.1 This baby (these babies)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.2 Husband / partner	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.3 Other children	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.4 Other family	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.5 Friendships	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.6 Paid work / career	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.7 Household cleaning, laundry etc	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.8 Time for myself	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.9 Exercise	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13.10 Other *(please specify below)*.....	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Thank you for taking the time to complete this survey. We appreciate how busy this time is for you and truly appreciate your sacrifice. We hope that your responses will help future mothers to cope with what can be a very challenging peiod in a woman's life. If you have any further comments you would like to make regarding your breastfeeding experience, please do so below. I look forward to talking to you when your baby is six months old, *Maxine*

Appendix H

Phase 2 Six Month Follow-up Questionnaire

7582212276

Infant Feeding Study - Six Month Follow-up

These details to facilitate phone contact only *(not for entry)* **-**

Mother's Name .....

Baby's name .....

Date ☐☐ / ☐☐ / ☐☐ **ID No** ☐☐☐☐

1. How are you feeding your baby now?

☐ 1. Breastmilk only (go to Q6)

☐ 2. Some breastmilk and some formula (go to Q2)

☐ 3. Formula only (go to Q4)

For those feeding with some breastmilk and some formula

2. If you are feeding your baby some breastmilk and some formula, approximately how many bottles of formula or juice does your baby have -

Per day? ☐ **OR** **Per week?** ☐

3. If you are feeding your baby some breastmilk and some formula, how old was your baby when you first introduced formula? *(in weeks or part weeks)* ☐

For those feeding with formula only

4. If you are feeding your baby with formula only, how long did you exclusively breastfeed for (breastmilk only)? *(in weeks or part weeks)* ☐

5. How old was your baby when you stopped breastfeeding entirely? *(in weeks or part weeks)* ☐

All mothers

6. Have you introduced solid foods into your baby's diet yet? ☐ **1. Yes** ☐ **2. No**

7. If so, at what age did you first introduce solids to your baby *(in weeks or part weeks)* ☐

Appendix I

Phase 2 Plain Language Statement and Consent Form

Infant Feeding Study Consent Form

Ms Maxine O'Brien, Dr Elizabeth Buikstra and Professor Desley Hegney from the Centre for Rural and Remote Area Health (at USQ) are conducting a study into the factors that influence the length of time that mothers breastfeed their babies. This study will include various psychological attributes in the mother which mothers participating in an earlier study told us were important to breastfeeding. The effect of these attributes on breastfeeding duration will be measured after other factors known to affect how long a mother breastfeeds for (like age and education) have been taken into account. We hope that the knowledge gained from this study will tell us how important these attributes are in the mother, and therefore help in the planning of programs aimed at increasing the length of time that mothers who choose to breastfeed manage to breastfeed for.

The questionnaire should take about 40 minutes to complete, and will be followed by a quick (5 minute) telephone interview when your baby is around 6 months old. At this follow-up interview, we will ask how you are feeding your baby at that time, at what age you introduced regular formula and/or solid foods to your baby, and the age at which weaning occurred if either have occurred.

Participation is entirely voluntary, and you are free to withdraw from the study, or to withdraw your data from the study at any time with no questions asked and without consequences. The results of the study will be reported as part of a PhD thesis being completed by Maxine O'Brien, and it is hoped that the findings will also be published in a psychology or nursing journal. Anything published from this research will report group data only, and you can be assured that no personal information will be published that may allow you or your baby to be identified as a participant.

If you agree to take part in the study, please sign the consent form below, which attests that you have read and understood this information. This form will be kept separately to your completed questionnaire so that your name is not attached to your responses. The ID coding will allow us to link responses to the first and second interviews at the time of follow up. Completed questionnaires will be kept in a secure location for 5 years, after which they will be shredded and disposed of as confidential waste.

Group results will be available to participants via the Centre for Rural and Remote Area Health's website at: www.usq.edu.au/sciences/research/crrah/default.htm. If you have any questions about this research project, please contact Maxine O'Brien on 46311993 / 0408 788 225 or Elizabeth Buikstra on 4631 5443. If you have a concern regarding the implementation of the project, you should contact The Secretary, Human Research Ethics Committee USQ or telephone (07)4631 2956 or the Chair of the Human Research Ethics Committee on 07 3326 3549, or 0405 153 012.

CONSENT FORM

I have read and understood the information above and agree to take part in this infant feeding study.

Signature:_____ **Date:**_____
Witness:_____**Date:**_____

IDENTIFYING INFORMATION FOR 6 MONTH FOLLOW UP (Please use block letters)

Name: _____
Phone: _____ **Alternative:** _____
Baby's date of birth: _____
Baby's name: _____

Appendix J

SPSS Life Tables and Median Survival Times for Significant Covariates

J.1 Fully Breastfeeding

J.1.1 Mother's occupation

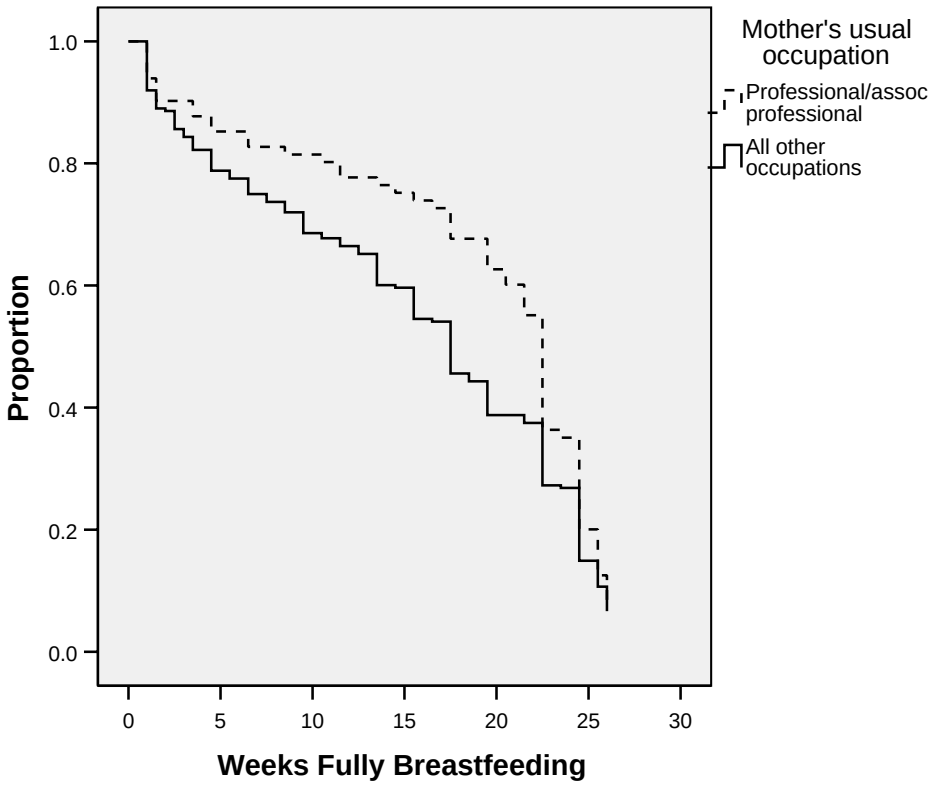


Figure J.1. Life table of the effect of the mother's usual occupation on the duration of Fully breastfeeding. The mother's usual occupation was significantly associated with the duration of Fully breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 6.7$, $p < .05$. Mothers whose usual occupation fell into a professional or associate professional ASCO category (Australian Bureau of Statistics, 2001b), were less likely to cease Fully breastfeeding early (*median survival time* = 22.14 weeks) than those in all other occupation categories *(median survival time* = 17.24 weeks).

J.1.2 Breastfeeding Experience

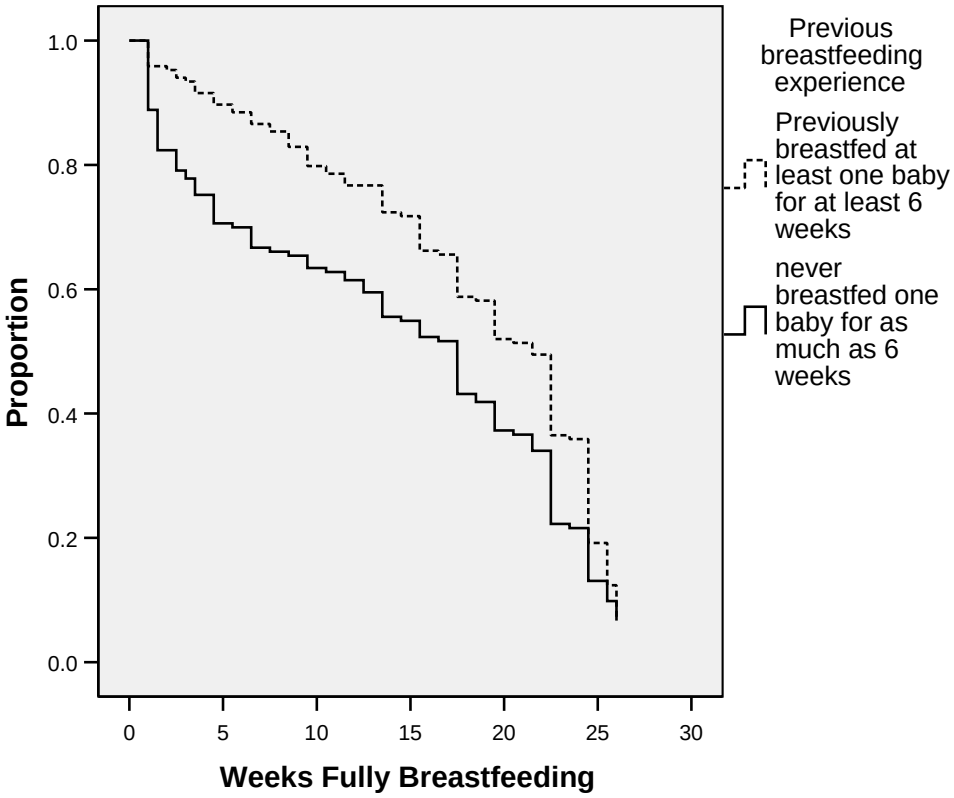


Figure J.2. Life table of the effect of the mother's previous breastfeeding experience on the duration of Fully breastfeeding. The mother's previous breastfeeding experience was significantly associated with the duration of Fully breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 13.37$, $p < .001$. Mothers who had previously breastfed at least one child for at least 6 weeks were less likely to cease Fully breastfeeding early (*median survival time* = 21.36 weeks) than those who had less previous breastfeeding experience *(median survival time* = 17.10 weeks).

J.1.3 Partner's Infant Feeding Preferences

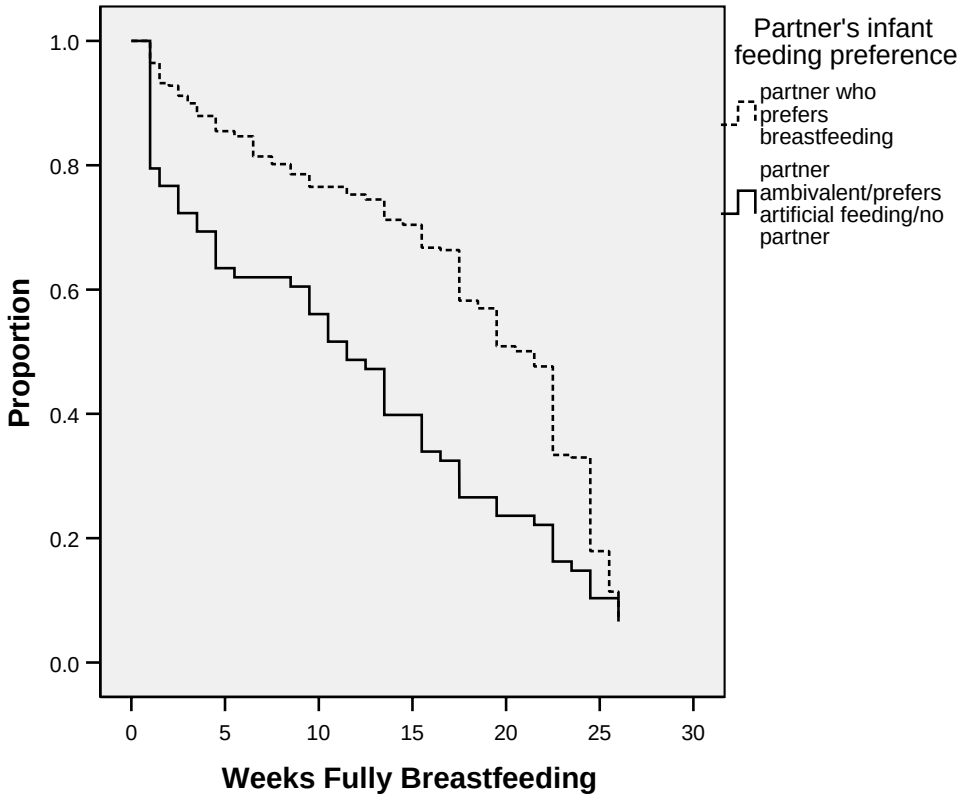


Figure J.3. Life table of the effect of the mother's perception of her partner's infant feeding preferences on the duration of Fully breastfeeding. The partner's perceived infant feeding preferences were significantly associated with the duration of Fully breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 22.07$, $p < .001$. Mothers who believed that their partner preferred breastfeeding as the method of feeding their infant were less likely to cease Fully breastfeeding early (*median survival time* = 21.01 weeks) than those who believed their partner was ambivalent about the infant feeding method, preferred artificial feeding, or who were single at the time of the first interview *(median survival time* = 11.28 weeks).

J.1.4 Time of Infant Feeding Decision

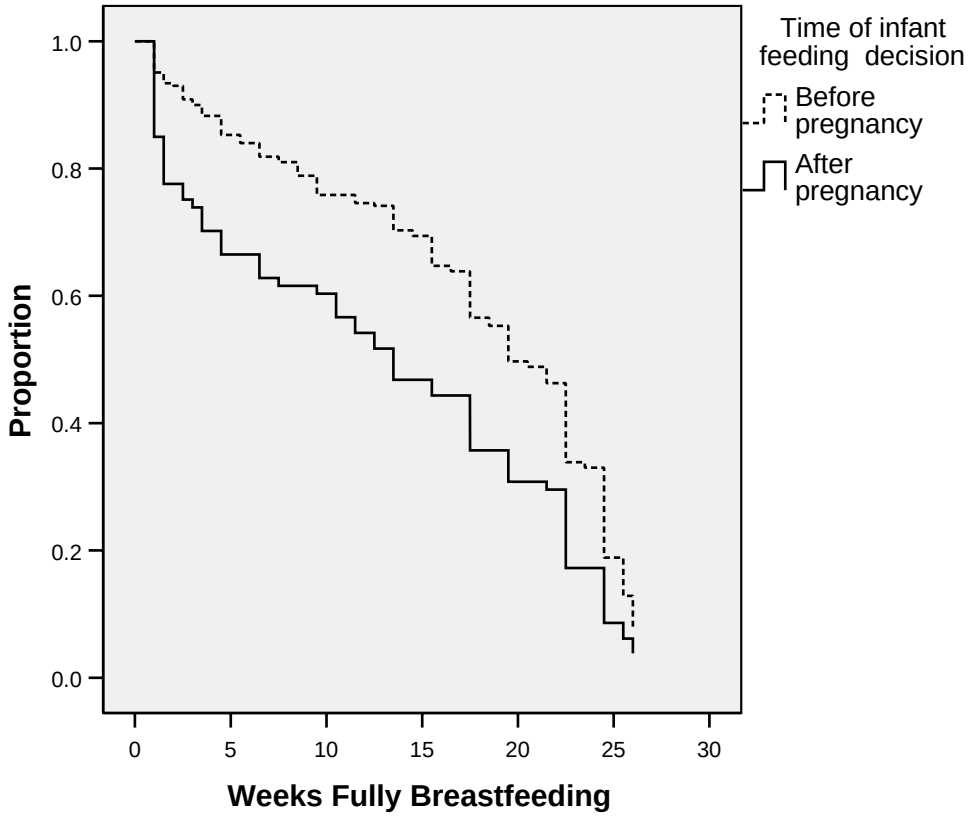


Figure J.4. Life table of the effect of the time at which the mother made her decision to breastfeed on the duration of Fully breastfeeding. The time of the infant feeding decision was significantly associated with the duration of Fully breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 15.68$, $p < .001$. Mothers who made the decision to breastfeed this baby before the pregnancy were less likely to cease Fully breastfeeding early (*median survival time* = 19.47 weeks) than those who made their infant feeding decision after they discovered they were pregnant this time (*median survival time* = 13.18 weeks).

J.1.5 Planned Duration of Breastfeeding

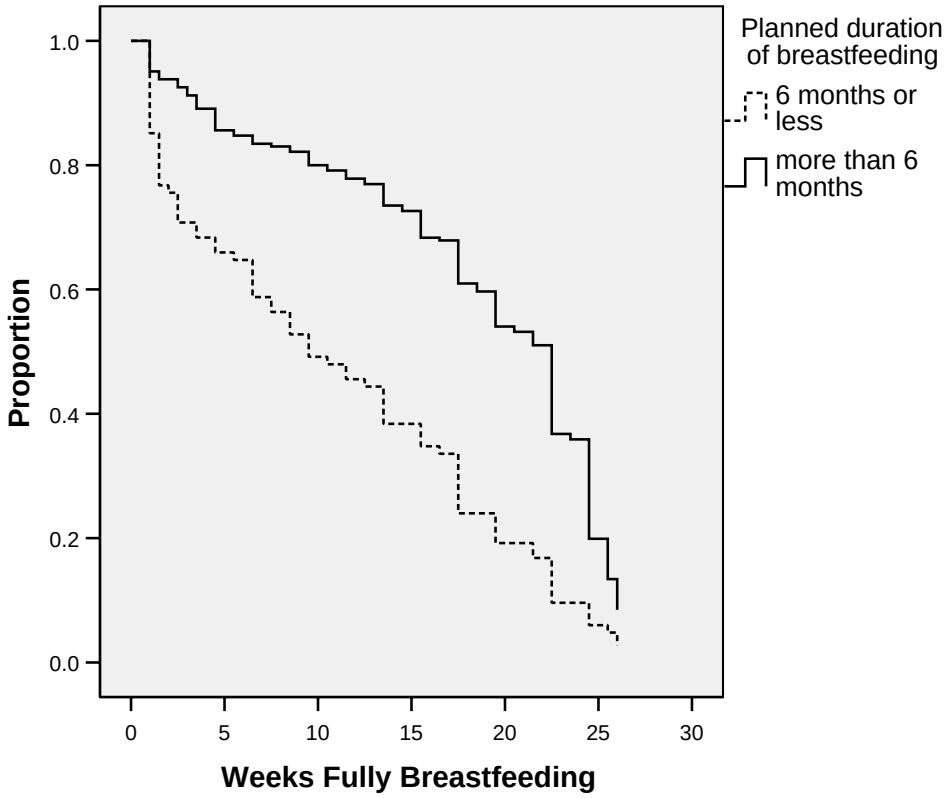


Figure J.5. Life table of the effect of the participant's planned duration of breastfeeding on the duration of Fully breastfeeding. The length of time for which the mother planned to breastfeed this baby during the first two weeks was significantly associated with the duration of Fully breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 38.47$, $p < .001$. Mothers who planned to breastfeed for more than 6 months were less likely to cease Fully breastfeeding early (*median survival time* = 22.04 weeks) than those who planned to breastfeed for 6 months or less *(median survival time* = 9.38 weeks).

J.2 Any Breastfeeding

J.2.1 Mother's occupation

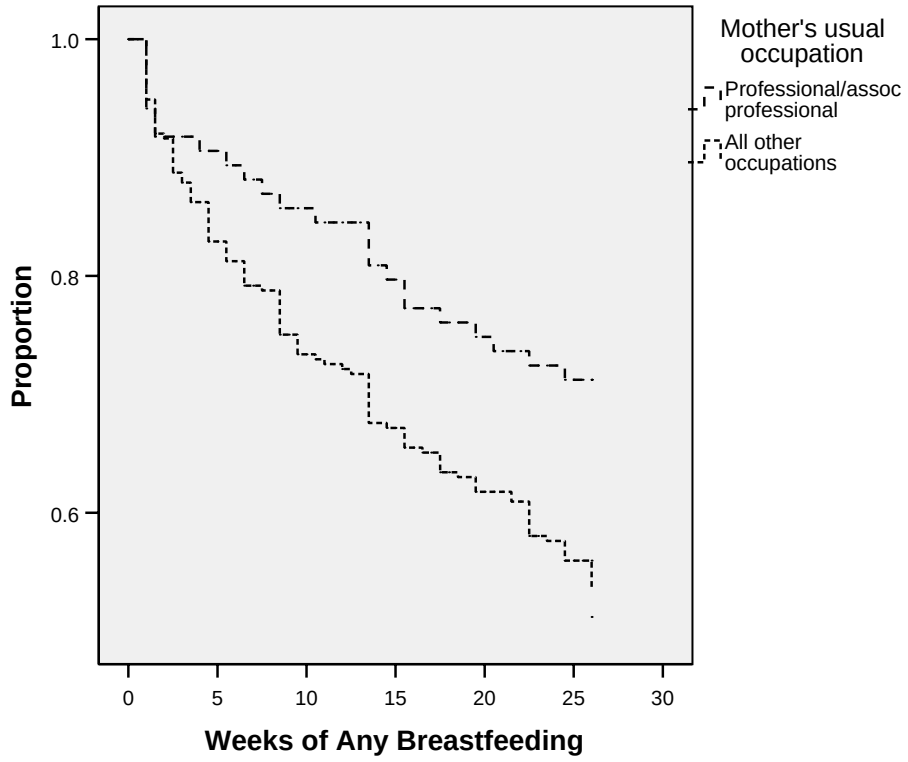


Figure J.6. Life table of the effect of the mother's usual occupation on the duration of Any breastfeeding. The mother's usual occupation was significantly associated with the duration of Any breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 6.54$, $p < .05$. Though the median survival times were identical, mothers whose usual occupation fell into a professional or associate professional ASCO category (Australian Bureau of Statistics, 2001b), were less likely to cease Any breastfeeding early (*median survival time* = 26.00 weeks) than those in all other occupation categories *(median survival time* = 26.00 weeks).

J.2.2 Breastfeeding Experience

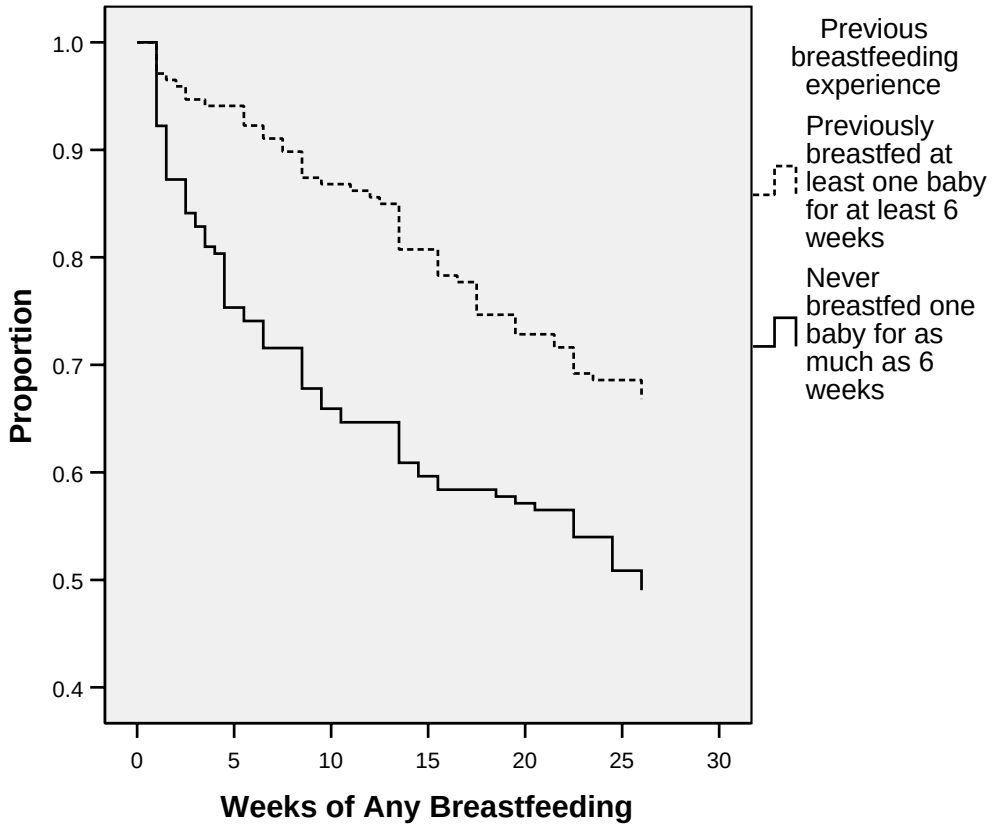


Figure J.7. Life table of the effect of the mother's previous breastfeeding experience on the duration of Any breastfeeding. The mother's previous breastfeeding experience was significantly associated with the duration of Any breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 15.66$, $p < .001$. Though the median survival times were identical, mothers who had previously breastfed at least one child for at least 6 weeks were less likely to cease Any breastfeeding early (*median survival time* = 26.00 weeks) than those who had less previous breastfeeding experience *(median survival time* = 26.00 weeks).

J.2.3 Partner's Infant Feeding Preferences

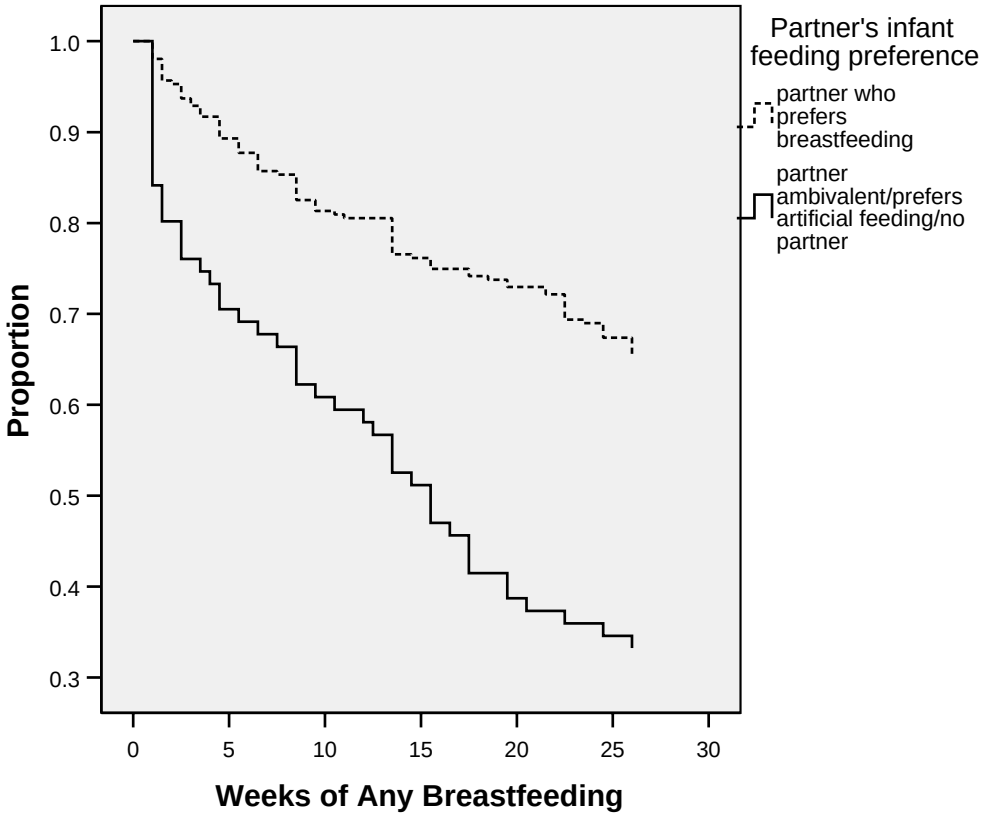


Figure J.8. Life table of the effect of the mother's perception of her partner's infant feeding preferences on the duration of Any breastfeeding. The partner's perceived infant feeding preferences were significantly associated with the duration of Any breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 28.90$, $p < .001$. Mothers who believed that their partner preferred breastfeeding as the method of feeding their infant were less likely to cease Any breastfeeding early (*median survival time* = 26.00 weeks) than those who believed their partner was ambivalent about the infant feeding method, preferred artificial feeding or who were single at the time of the first interview *(median survival time* = 15.14 weeks).

J.2.4 Time of Infant Feeding Decision

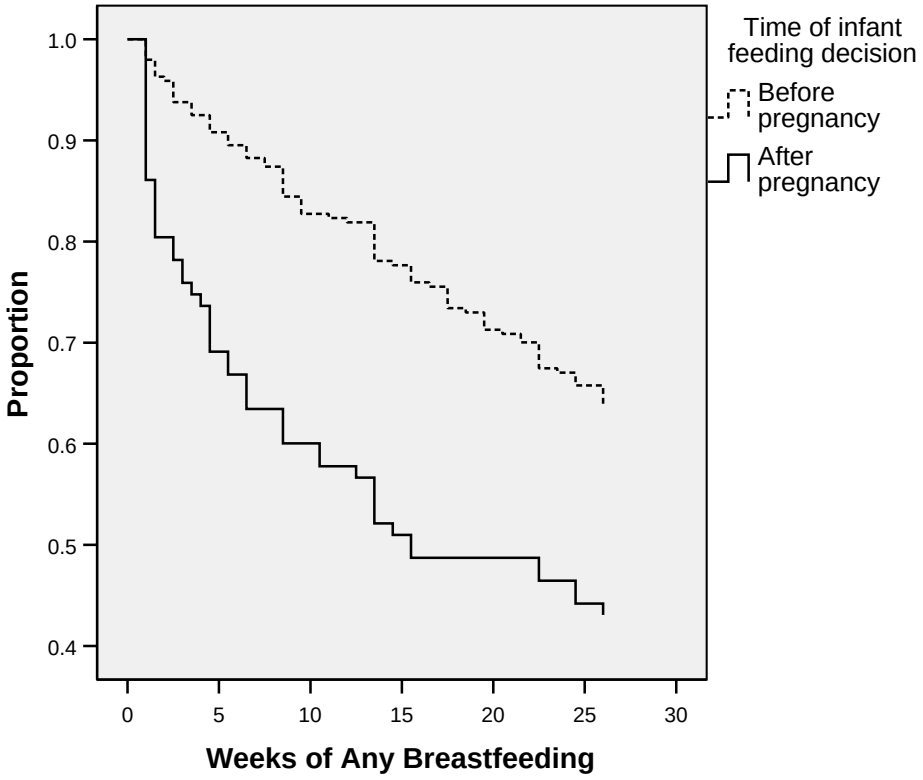


Figure J.9. Life table of the effect of the time at which the mother made her decision to breastfeed on the duration of Any breastfeeding. The time of the infant feeding decision was significantly associated with the duration of Any breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 20.61$, $p < .001$. Mothers who made the decision to breastfeed this baby before the pregnancy were less likely to cease Any breastfeeding early (*median survival time* = 26.00 weeks) than those who believed their partner was ambivalent about the infant feeding method, preferred artificial feeding, or who were single at the time of the first interview *(median survival time* = 15.22 weeks).

J.2.5 Planned Duration of Breastfeeding

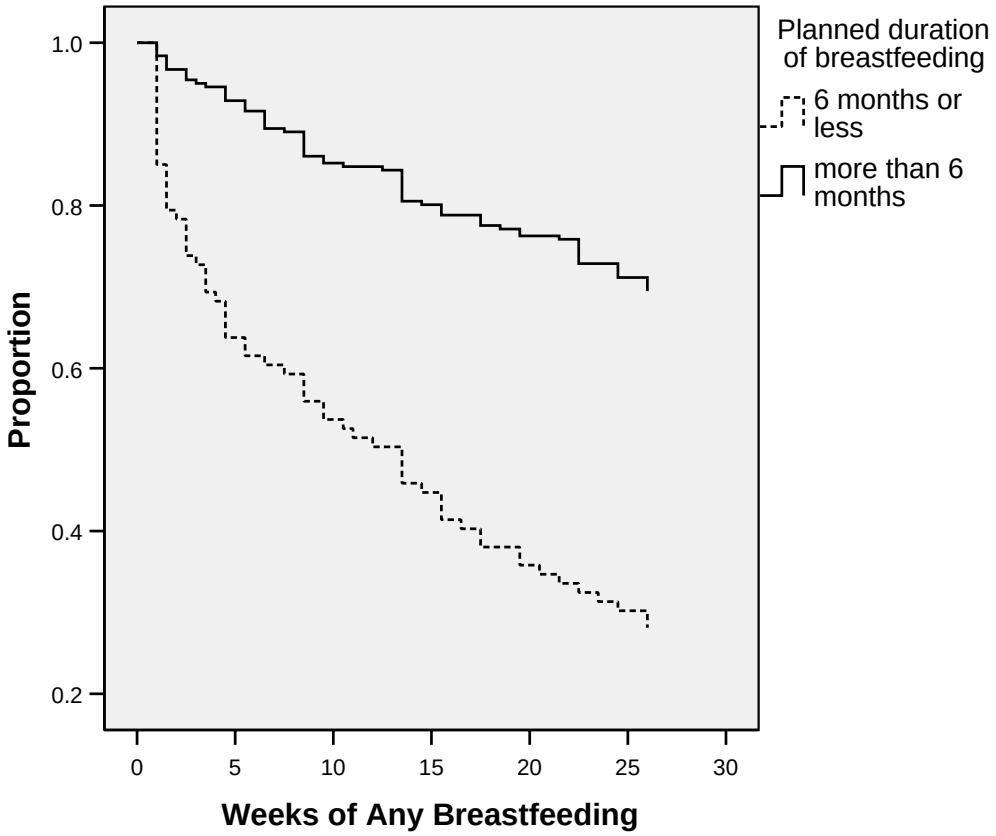


Figure J.10. Life table of the effect of the participant's planned duration of breastfeeding on Any breastfeeding duration. The length of time for which the mother planned to breastfeed this baby during the first two weeks postpartum was significantly associated with the duration of Any breastfeeding, Wilcoxon (Gehan) $\chi^2(1) = 57.12$, $p < .001$. Mothers who planned to breastfeed for more than 6 months were less likely to cease Any breastfeeding early (*median survival time* = 26.00 weeks) than those who planned to breastfeed for 6 months or less *(median survival time* = 13.04 weeks).

Appendix K

Spearmans Rho Correlations for Continuous Variables Considered for Inclusion in Study 2 Analyses

	Age	Education	Self-Esteem	Psychological Reactance	Adaptability	Optimism	BF Self-Efficacy	Achievement Striving	Faith in BF	BF Expectations	Depression	Anxiety	Stress	Weeks Any BF	Weeks Fully BF
Education	.25‡														
Self-Esteem	.04	.14†													
Psych Reactance	-.06	-.08	-.29‡												
Adaptability	.02	.06	.26‡	-.53‡											
Optimism	.13*	.27‡	.56‡	-.33‡	.29‡										
BF Self-Efficacy	.13*	.00	.31‡	-.05	.06	.24‡									
Achievement Striving	.05	.16†	-.06	.04	-.04	-.05	-.01								
Faith in BF	.01	.14†	.07	.09	-.12†	.07	.40‡	.00							
BF Expectations	-.07	-.01	-.18‡	.04	-.02	-.20‡	-.59‡	.01	-.27‡						
Depression	-.05	-.05	-.34‡	.21‡	-.24‡	-.25‡	-.18†	.09	.00	.15†					
Anxiety	-.15†	-.18‡	-.26‡	.11*	-.17‡	-.24‡	-.22‡	.07	-.12*	.12*	.53‡				
Stress	-.04	.08	-.27‡	.21‡	-.26‡	-.21‡	-.18‡	.28‡	.04	.13*	.64‡	.56‡			
Weeks Any BF	.20‡	.24‡	.08	-.01	.01	.18‡	.46‡	.01	.39‡	-.30‡	-.10	-.16†	-.07		
Weeks Fully BF	.20‡	.19‡	.09	.01	-.08	.12*	.48‡	.03	.49‡	-.36‡	-.08	-.12*	-.02	.82‡	

Note. $N = 372$; BF = Breastfeeding; * $p < .05$; †$p < .01$; ‡$p < .001$