Got milk? : the influence of toddler formula advertising on attitudes and beliefs about infant feeding

Nina Jane Berry
University of Wollongong


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Got Milk?
The influence of toddler formula advertising on attitudes and beliefs about infant feeding

A thesis
submitted in fulfilment of the requirements for the award of the
Degree of Doctor of Philosophy
of the
University of Wollongong
by

Nina Jane Berry BA/BEd (Hons) DipArts

2010
Declaration

I declare that this thesis is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Nina Jane Berry

22\textsuperscript{nd} March 2010
Acknowledgements

All I have needed Thy hand hath provided ...

Many thanks are owed:

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The respondents who gave their time and shared their insights in interviews, questionnaires and discussion fora, without them there would be no thesis.

Nihil sine labore
Abstract

**AIMS** This project sought to determine whether advertisements for toddler milk function as de-facto advertising for infant formula in Australia, and whether exposure to these advertisements influences parents’ attitudes towards breastfeeding or formula feeding.

**DESIGN** A mixed methods triangulation model was selected to facilitate thorough investigation of a complex public health issue.

**METHODS** Four studies were conducted simultaneously and the results synthesised at the level of analysis. In-depth interviews were conducted to examine expectant mothers’ understandings of toddler milk advertisements. Content analysis was used to compare the frequency with which advertisements for various formula products and brands appeared in parenting magazines from countries with differing regulations about the marketing of formula milk products. A cross-sectional survey was conducted to investigate the effect of exposure to toddler milk advertising on attitudes and beliefs about breastfeeding and formula feeding. A series of discussion fora were used to investigate the influence of advertising on the infant feeding attitudes and beliefs of parents and those who influence them.

**RESULTS** Mothers expecting a first baby perceived toddler milk advertisements to be advertising infant formula and found their claims that formula brands can confer health benefits similar to those mothers associate with breastfeeding to be believable. Toddler milk advertisements occurred with greater frequency in Australian parenting magazines than they did in those from the UK, USA or Canada. Exposure to toddler milk advertising is associated with more positive attitudes towards formula feeding amongst parents who are not university educated. In the absence of accurate, evidence-based
information about infant formula, mothers, grandmothers and Child and Family Health Nurses rely on advertising to inform their decisions and advice about infant formula.

**CONCLUSIONS** The Marketing in Australia of Infant Formula: Manufacturers’ and Importers’ Agreement is failing to protect consumers from advertising that minimises the important differences between breastmilk/breastfeeding and formula feeding.
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Abbreviations

AAP American Academy of Pediatrics
AAFP American Academy of Family Physicians
ACOG American College of Obstetrics and Gynecology
ADA American Dietetic Association
APMAIF Advisory Panel on the Marketing in Australia of Infant Formula
BFHI Baby Friendly Hospital Initiative
CDC Centers for Disease Control
EC European Community
IFMC Infant formula manufacturing company
IFAS Iowa Infant Feeding Attitudes Scale
International Code The International Code of Marketing of Breastmilk Substitutes and subsequent relevant resolutions of the World Health Assembly
LRTI Lower Respiratory Tract Infection
MAIF Marketing in Australia of Infant Formula: Manufacturers’ and Importers’ Agreement
MLR Multiple Linear Regression
NHMRC National Health and Medical Research Council
NHS National Health Survey
NSW New South Wales
ORS Oral Rehydration Solution
PIFSII Perth Infant Feeding Study II
PHAA Public Health Association of Australia
PHAP Pharmaceutical and Healthcare Association of the Philippines
QLD Queensland
RACP Royal Australasian College of Physicians
RCM Royal College of Midwives
UK United Kingdom
UKDoH United Kingdom Department of Health
UNICEF United Nations Children’s Fund
USA United States of America
USDHHS United States Departments of Health and Human Services
WHA World Health Assembly
WHO World Health Organization
WIC Special Supplemental Nutrition Program for Women Infants and Children
Definitions

**Bottle feeding**  
Infant is fed infant formula from an infant feeding bottle.

**Exclusive breastfeeding/**  
**Exclusively breastfed**  
Infant must be fed human milk either from the mother, a wet nurse or a donor directly or from an infant feeding device. Infant may also be fed oral rehydration solution, medicines, vitamins or minerals. Infant must not be fed anything else.

**Follow-on formula**  
A product based on milk or other edible food constituents of animal or plant origin, which is nutritionally adequate to serve as the principal liquid source of nourishment for an infant less than six months old.

**Formula milk**  
Any powdered milk product that shares a brand identity and identical packaging with an infant formula product.

**Brand extension**  
The use of an established product’s brand identity for a new product in a different product category.

**Formula product**  
Any milk product that shares a brand identity with an infant formula product.

**Full breastfeeding/**  
**Fully breastfed**  
Infant is fed human milk as the predominant source of nourishment. Infant may also be fed oral rehydration solution, medicines, vitamins or minerals, water based drinks (eg tea) or fruit juice. Infant must not be fed anything else, particularly non-human milk, infant formula or other food-based fluids. This definition includes exclusively breastfed infants.

**Formula brand**  
Brand identifiers that are associated with an infant formula product.

**Growing up milk**  
Liquid milk, often fortified, that shares a brand identity with an infant formula product. Represented as suitable for children more than a year old.

**Infant**  
A person less than 12 months old.

**Infant formula**  
A product based on milk or other edible food constituents of animal or plant origin, which is nutritionally adequate to serve as the sole diet of an infant less than six months old.

**Line Extension**  
The use of an established product’s brand identity for a new product in the same product category.

**Mixed feeding**  
Infant is fed a combination of human milk (either at the mother’s breast or from an infant feeding device) and infant formula. Infant may also be fed other foods and/or fluids.

**Product category**  
A group of products that meet a general need. For example, ‘soft drink’ and ‘infant nutrition’ and ‘health and beauty’ are product categories.

**Product line**  
A set of related products sold by the same company bearing a single brand identity.

**Toddler milk**  
Powdered milk of animal or plant origin, often fortified, that shares a brand identity with infant formula, and is presented in packaging that is identical in size and shape to an infant formula product. Represented as suitable for children more than a year old.
Chapter One

Introduction

1 THE PROBLEM

Breastfeeding is recommended by all major national and international public health organisations. There is evidence that feeding in infancy has an important influence on health throughout the life course. Infant feeding practices also have important implications for the health of mothers. Globally, few mothers feed their infants in accordance with public health recommendations. Intransigently low breastfeeding prevalence and widespread use of infant formula across the developed world suggest that the dynamics of the decision to replace human milk with infant formula are not well understood.

Since 1981 the World Health Organization (WHO) has been calling for a moratorium on the promotion (including advertising) of breastmilk substitutes including, but not limited to, infant formula. This call has been founded on the belief that the advertising of infant feeding products leads to a decrease in the prevalence and intensity of breastfeeding which has important public health ramifications. There is some published evidence that the advertising of infant formula products increases the use of these products in competition with breastfeeding in both developed and developing world settings.

In Australia the advertising of those formula milk products suitable for use as a partial or total replacement for human milk in the first year of life has been prohibited by industry self-regulation since 1992 (Australian Government Department of Health and Ageing 1992). However toddler milks, which are presented in packaging that is
nearly identical to that of formula products but marketed for consumption by older children, can be advertised without restriction. This strategy has been questioned, especially in light of international research that found mothers do not distinguish between advertisements for infant formula and those for other formula milk products. Advertising for toddler milks has appeared in the Australian market since 1991 and many believe that it functions as indirect advertising for infant formula (House of Representatives Standing Committee on Health and Ageing 2007).

2 PROJECT AIMS

This project sought to determine whether advertisements for toddler milk function as de-facto advertising for infant formula in Australia, and whether exposure to these advertisements influences parents’ attitudes towards breastfeeding or formula feeding. A series of four studies was conducted. The first study examined expectant mothers’ understandings of toddler milk advertisements using in-depth interviews. The second study compared the frequency with which advertisements for formula products, including toddler milk, and formula brands appeared in parenting magazines from four English-speaking countries with differing regulations about the marketing of formula milk products. The third study investigated the effect of exposure to toddler milk advertising on attitudes and beliefs about breastfeeding and formula feeding using a cross-sectional survey. The fourth study used interviews to investigate the influence of advertising on the infant feeding attitudes and beliefs of parents and those who influence them.

3 SIGNIFICANCE AND ORIGINALITY

Although there has been some research addressing whether mothers confuse follow-on formula advertising with infant formula advertising, this was the first study to
investigate the influence of toddler milk advertising on attitudes and beliefs about infant feeding. If toddler milk advertising is perceived to be advertising for infant formula, it is enabling companies to circumvent national efforts to regulate the advertising of infant formula and render national regulations impotent.

Many governments spend significant amounts of money promoting breastfeeding through health systems and the community. It is anticipated that the results of this research will contribute to policy considerations regarding the question of whether toddler milk advertising also promotes infant formula and infant formula feeding. If toddler milk advertising promotes formula feeding, it is likely that it undermines breastfeeding promotion efforts. This project is the first to collect evidence that can inform decisions about the regulation of the advertising of toddler milk products. It addresses a significant gap in the extant literature and has implications for health promoters and health policy makers.

4 THESIS OUTLINE

Chapter One presents the context for this project, outlining the need for research and providing an overview of the relevant literature. It is presented in seven sections. The first section describes the infant feeding recommendations current in four developed English-speaking countries. The second section explores the health implications of infant feeding decisions for both infants and their mothers. The third section provides an account of the results of population studies of the prevalence and intensity of breastfeeding, including the prevalence of infant formula use where this is available. The fourth section reviews the literature from a number of disciplines examining the influence of advertising on infant feeding practices. The fifth section reviews the literature addressing the relationship between attitudes and infant feeding. The sixth section illustrates the relationship between formula use and the duration of
breastfeeding. The seventh section provides an overview of the evidence that advertising influences attitudes towards other health behaviours.

Chapter Two presents a description of the overall methodology employed for this project. The rationale behind the choice of a four-stage mixed method design is presented along with a discussion of the methodologies selected for each of the four studies.

Chapters Three to Six report the materials, methods and results of each of the four studies conducted for this project. Sample selection, recruitment, and data analysis techniques are outlined in these chapters. Chapter Three describes Study One in which semi-structured interviews based on a stimulus (print advertisements for toddler milk) were used to investigate expectant mothers’ understandings of toddler milk advertisements. Chapter Four describes Study Two in which the frequency with which advertising for various formula milk products and brands appears in parenting magazines that originated in four countries in order to compare the effects of national restrictions on the advertising of formula milk products. Chapter Five describes the use of a cross-sectional survey design to examine the relationship between self-reported exposure to toddler milk advertising and attitudes towards breastfeeding and formula feeding. Chapter Six describes the use of semi-structured interviews to explore the awareness and responses of health professionals, mothers and grandmothers to advertising for toddler milk products.

The results of the four studies are synthesized and discussed in the final chapter, which also includes recommendations for future research and policy initiatives.
Background and Literature

1  INFANT FEEDING RECOMMENDATIONS

1.1  The first six months
National and international bodies concerned with the health and nutrition of infants recommend exclusive breastfeeding for the first six months of a baby’s life with remarkable unanimity (NHMRC 2003; UK Department of Health 2003; United States Dept of Health and Human Services 2000; WHO/ UNICEF 2003). Exclusive breastfeeding means that the baby is fed human milk and no other foods or fluids with the exception of medicinal drops or syrups. The Global Strategy for Infant and Young Child Feeding (WHO/ UNICEF 2003, pp7-8) states, ‘As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health’. This recommendation is based on a systematic review addressing the question of the optimal duration of exclusive breastfeeding (Kramer and Kakuma 2002) and was unanimously adopted by all WHO member states in 2002 (Cattaneo, Fallon et al. 2007; WHA 55.25 2002). Thus there is agreement across the world that infants should be exclusively breastfeeding for around six months and that the introduction of foods or fluids other than human milk before six months is detrimental to their health.

1.2  Beyond six months
According to the Global Strategy for Infant and Young Child Feeding infants from six months of age ‘should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond’. Although this recommendation was adopted unanimously at the WHA, there has been some
inconsistency in the translations of this recommendation into those made by various
national bodies.

Health Canada (Canadian Paediatric Society and Dietitians of Canada and Health
Canada 2005), the Public Health Association of Australia (PHAA) (2002) the Royal
College of Midwives (RCM) (2004) and the European Community (EC) (Cattaneo,
Fallon et al. 2007) unambiguously concur with the WHO/UNICEF recommendation.

Statements from other bodies are more ambiguous. The Australian National Health
and Medical Research Council (NHMRC) (2003) and the Royal Australasian College
of Paediatricians’ position (RACP) (2006) both recommend that breastfeeding
continue until 12 months of age and thereafter as long as mutually desired. However
the NHMRC later asserts that, ‘breastfeeding and its substantial benefits may continue
for two years and beyond’ (p288). The American Academy of Pediatrics’ (AAP) and
the American Academy of Family Physicians’ (AAFP) positions contain similarly
ambiguous statements. The AAP recommends that, ‘Breastfeeding should be
continued for at least the first year of life and beyond for as long as mutually desired
by mother and child’ (AAP Section on Breastfeeding 2005, p499) and the AAFP that,
‘Breastfeeding should continue with the addition of complementary foods throughout
the second half of the first year. Breastfeeding beyond the first year offers
considerable benefits to both mother and child, and should continue as long as
mutually desired’ (AAFP 2001). The American Dietetic Association (ADA) (2006,
p810) recommends ‘breastfeeding with complementary food for at least 12 months’.
The UK Department of Health (2003) and the British Dietician's Association (2009)
recommend only that breastfeeding continue after six months and make no further
recommendation.
1.3 Severance
There are no recommendations about when breastfeeding should cease and no evidence that breastfeeding becomes harmful at any age.

2 HEALTH IMPLICATIONS OF INFANT FEEDING
The significance of breastfeeding to human health is so well established that the US Surgeon General has referred to breastfeeding as ‘one of the most important contributors to infant health’ (United States Dept of Health and Human Services 2000, p3) and the NHMRC describes it as ‘one the most cost effective primary prevention measures available’ (NHMRC 2003, p14). There is an increasing body of epidemiological evidence, examination of which is beyond the scope of this work, detailing the significance of early infant feeding practices on infant morbidity and mortality, both during infancy and throughout the life course (Chen and Rogan 2004; Horta, Bahl et al. 2007; Ip, Chung et al. 2007). Breastfeeding also has important health ramifications for mothers (Ip, Chung et al. 2007; Labbok 2001).

2.1 Infectious disease
The increased risk of infectious disease associated with not breastfeeding is highlighted in many of the position statements. This includes increased risk of necrotizing enterocolitis, gastroenteritis, lower respiratory tract infection, otitis media, urinary tract infection and other general infection (AAFP 2001; AAP Section on Breastfeeding 2005; Canadian Paediatric Society and Dietitians of Canada and Health Canada 2005; Cattaneo, Fallon et al. 2007; NHMRC 2003; UK Department of Health 2003). The EC and the AAFP also note an increased risk of hospital admission and postneonatal mortality in developed countries associated with artificial feeding (AAFP 2001; Cattaneo, Fallon et al. 2007).
2.2 Non-infectious disease

The increased risk of a number of non-infectious and chronic diseases associated either with not breastfeeding or with formula feeding (full or partial) is mentioned in a number of the position statements. This includes type I and II diabetes mellitus, allergies, sudden infant death syndrome, hypertension, some forms of cancer, inflammatory bowel disease, obesity and overweight (AAFP 2001; AAP Section on Breastfeeding 2005; Canadian Paediatric Society and Dietitians of Canada and Health Canada 2005; Cattaneo, Fallon et al. 2007; NHMRC 2003; UK Department of Health 2003). A number of statements highlight evidence that babies who are not breastfed have lower IQ and developmental scores (AAFP 2001; AAP Section on Breastfeeding 2005; Cattaneo, Fallon et al. 2007; RACP 2002; Royal Australian College of Physicians 2006; WHO/ UNICEF 2003). The AAP and the AAFP note that babies who are not breastfed develop lower titers in response to immunization (AAFP 2001; AAP Section on Breastfeeding 2005).

2.3 Maternal health and breastfeeding

A number of position statements also indicate that there are health ramifications of infant feeding practices for mothers. Mothers who breastfeed are at lower risk of: post partum haemorrhage; post pregnancy weight retention; breast, endometrial and ovarian cancers; and osteoporosis. They also have improved glucose profiles, longer periods of amenorrhea leading to improved iron status and increased child spacing (AAFP 2001; AAP Section on Breastfeeding 2005; Cattaneo, Fallon et al. 2007; NHMRC 2003; UK Department of Health 2003).

2.4 Nutritional and bioactive properties of human milk

In addition to mention of morbidity and mortality associated with infant feeding, a number of the position statements under discussion here make mention of the
nutritional and bioactive properties of human milk. Again the consensus is notable. Each statement notes that human milk is uniquely nutritionally complete and each highlights a slightly different aspect of the importance of human milk and breastfeeding to the health and development of human infants. Several statements note that breastfeeding is the physiologic norm and/or assert that breastfed infants ought to be regarded as the reference group for physiologic growth and development (AAFP 2001; AAP Section on Breastfeeding 2005; American Dietetic Association 2006; Cattaneo, Fallon et al. 2007; Health Canada 2000; NHMRC 2003; Public Health Association of Australia 2002; WHO/UNICEF 2003). These statements effectively foreground formula use as a risk factor for adverse health outcomes (Berry and Gribble 2008).

There is also consensus that neither breastfeeding nor human milk can be replicated. The AAP, the American College of Obstetrics and Gynecology (ACOG), the ADA, the NHMRC and the EC each underline the importance of human milk as both species-specific and dynamic; that is, it changes over the course of a feed, over the course of a day and over the course of lactation to meet the evolving needs the human infant (AAP Section on Breastfeeding 2005; ACOG 2000; Cattaneo, Fallon et al. 2007; NHMRC 2003). The ADA (2006) notes that human milk provides infants with all the nutrients required for physiologic growth and development while simultaneously avoiding stressing their immature renal and digestive systems. Both the ADA and the NHMRC note that the lipids and micronutrients in human milk are more bioavailable than those derived from other sources and that this efficiency is further enhanced by the presence of lipase in human milk. The NHMRC (2003) also notes the complex combinations of substances found in human milk that have primary functions other than nutrition. Human milk is not only food; it also contains many
components – for example bile salt-stimulated lipase, glutamate, certain polyunsaturated long chain fatty acids, low sodium, lysozyme, immunoglobulin A, growth factors and numerous other bioactive factors such as oligosaccharides and probiotics – which facilitate the proper function of infants’ immature systems. In addition the AAP (2005) also draws attention to the documented analgesic effect of human milk.

3 HEALTH RISKS ASSOCIATED WITH INFANT FORMULA USE

It is difficult to separate the risks associated with the deprivation of breastfeeding from those associated with exposure to infant formula, since the one usually necessitates the other, and the provision of a comprehensive review of the evidence is beyond the scope of this work. However it should be noted that the AAFP mentions that there is evidence of a dose-response effect in infant feeding; infants exclusively formula fed from birth (those who are never breastfed) are at greatest risk of adverse health outcomes (AAFP 2001).

Several examples of studies finding a dose response relationship between formula use and illness have been published recently. Data collected for the Millennium Cohort Study demonstrated a strong dose response linking the use of formula milk with hospitalisation for gastroenteritis and lower respiratory tract infection (LRTI) (Quigley, Kelly et al. 2009). It is not the first study to find an association between infant feeding practices and respiratory and gastrointestinal infection (Beaudry, Dufour et al. 1995; Oddy 2001, 2002, 2004; Oddy, Sly et al. 2003; Paricio Talayero, Lizan-Garcia et al. 2006). However, Quigley and colleagues (2009) found that infants less than nine months old whose main milk had been formula milk during the preceding month were more likely to be hospitalised for LRTI (AOR = 1.5) and diarrhoea (AOR = 2.5) compared with those fed mainly human milk, regardless of
what other foods the infant had consumed. The adjusted odds ratios for hospitalisation amongst infants fed a combination of infant formula and human milk were 1.4 for both LRTI and diarrhoea. Controlling for other foods the infant had consumed establishes a causal relationship between exposure to infant formula and hospitalisation for these two illnesses by demonstrating that it is not deprivation of breastmilk (as in the case of breastfed infants also fed solid foods prematurely) but exposure to formula milk that is associated with hospital admission.

It is often believed that the health risks associated with formula feeding stem entirely from water borne contamination, poor food handling practices or incorrect reconstitution. However, there is an established body of evidence, not mentioned in the position statements, demonstrating that exposure to even properly prepared infant formula alters infant gut flora and raises gastrointestinal pH, making infants more susceptible to infection.

The intestinal microflora of breastfed infants is dominated by beneficial anaerobic organisms such as bifidobacteri and lactobacilli which lower intestinal pH and suppress the growth of pathogenic bacteria. More recently another strain, ruminococcus, has been identified in the intestinal microflora of breastfed babies. This organism is known to inhibit the growth of the potentially pathogenic clostridia. In contrast, the intestinal microflora of formula fed infants is more diverse. It is characterised by large colonies of potentially pathogenic organisms such as bacteroides, clostridia, enterobacteria and streptococci. These organisms in turn raise pH creating an environment that is conducive to further colonisation by and overgrowth of pathogens. These and other pathogenic organisms can also translocate to systemic organs and tissues such as the lungs. These changes have been observed even amongst infants who are also breastfed (Arvola, Ruuska et al. 2006; Brandtzaeg
Thus the risk of infection posed by exposure to infant formula is only compounded by poor food handling practices and errors in reconstitution – which are common (Carletti and Cattaneo 2008; Herbold, Scott et al. 2008; Labiner-Wolfe, Fein et al. 2008; Sanchez-Carrillo, Padilla et al. 2009). Furthermore, few parents are aware that powdered infant formula is not a sterile product and can harbour inherent pathogens (WHO 2005).

In addition to introducing significant health risks, the initiation of formula feeding is known to have a detrimental effect on breastfeeding duration. Several studies conducted over the last decade have found that in-hospital formula supplementation is associated with shorter overall breastfeeding duration (Alikasifoglu, Erginoz et al. 2001; Bolton, Chow et al. 2009; Chezem, Friesen et al. 2003; Giovannini, Riva et al. 2005; Howard, Howard et al. 2003; Murray, Ricketts et al. 2007; Riva, Banderali et al. 1999). These studies strengthen a body of evidence that has been accumulating for several decades (Saadeh and Akre 1996).

None of the recent studies is a randomised controlled trial and so it is possible that early formula use is a marker for breastfeeding difficulties. However, Chezem and colleagues (2003) found that supplementation with infant formula in hospital significantly shortened breastfeeding duration compared to no formula supplementation but that supplementation per se (with glucose water) did not. Furthermore they found no significant relationship between in-hospital formula supplementation and anticipated duration of breastfeeding suggesting that in-hospital formula supplementation is not a marker for intention to stop breastfeeding.
Giovannini and colleagues’ (2005) study of Italian mothers also found that the use of water-based supplements in hospital had no significant effect on overall breastfeeding duration after adjusting for confounders. These studies suggest that early exposure to infant formula plays an important role in the early termination of breastfeeding.

Furthermore Bolton and colleagues’ (2009) prospective cohort study found that formula supplementation on postpartum day one was associated with reductions in breastfeeding duration of 37.9 days amongst women enrolled in WIC before their babies were born, and 49.1 days amongst women who enrolled after their babies were born. Given that the onset of copious milk production (lactogenesis II) is not expected until 48 to 72 hours post-partum (Lawrence and Lawrence 2005) and therefore breastfeeding problems are unlikely to emerge before then, this study suggests a causal relationship between early formula use and truncated breastfeeding duration. Furthermore, there is a plausible biological explanation for this phenomenon. Feeding babies foods other than breastmilk reduces their appetites and so the frequency of breastfeeding and therefore the volume of milk taken from the breast. This in turn can result in reduction in milk synthesis, the involution of glandular tissue in the breast and then further reduction in milk synthesis (Lawrence and Lawrence 2005).

Further evidence that the initiation of formula feeding has a negative impact on breastfeeding duration is provided by longitudinal studies that examine the effect of the introduction of formula feeding on breastfeeding continuation. Vogel and colleagues (1999) followed 350 New Zealand mothers and their babies for 12 months. Those mothers who used infant formula at any time during the first month, irrespective of quantity or frequency, were 3.1 times more likely to cease breastfeeding before 12 months. Interestingly, mothers who fed their babies infant
formula from a bottle were at greater risk of ceasing breastfeeding before 12 months than mothers who fed their babies water or expressed breastmilk from a bottle. Similarly, Giovannini and colleagues (2004) followed 2450 Italian mothers and their babies for 12 months. While they also found that those infants who were fed infant formula in the first month were at the greatest risk of severance before 12 months (HR 4.39), this study noted that initiation of formula feeding at any time point increased the risk of severance before 12 months; those who started formula feeding in the 1-3 month period had a hazard ratio of 3.30 and those who started formula after 3 months had a hazard ratio of 2.38.

Initiation of formula feeding may be an indicator of intention to cease breastfeeding but several studies suggest that it is not. Vogel and colleagues (1999) found that initiation of formula feeding in the first months remained a significant predictor of breastfeeding cessation after controlling for short or uncertain breastfeeding goals. In a similar but smaller study, Chezem and colleagues (1998) followed 74 American first-time mothers for six months. All these mothers were planning to return to paid employment within 12 months of birth. They found a strong correlation between the age at initiation of daily formula feeding and the duration of breastfeeding. In order to investigate whether the initiation of formula feeding reflected an intention to cease breastfeeding, this study used multiple regression analysis to examine the effect of formula feeding on mothers’ achievement of their stated breastfeeding goals. Age at initiation of daily formula feeding was an independent predictor of failure to meet breastfeeding goals. Furthermore mothers who intended to avoid using infant formula reported breastfeeding durations more than eight weeks longer than those who did not.
There is also evidence that the initiation of infant formula changes the daily pattern of breastfeeding, reducing both the frequency and duration of breastfeeds, and the overall duration of breastfeeding. Hornell and colleagues (2001a; 2001b) used a longitudinal design that involved the collection of comprehensive data including daily feeding diaries to compare the effect of introducing solids with the effect of introducing infant formula on breastfeeding patterns amongst mothers who had previously breastfed an infant for more than four months and planned to breastfeed the index child for more than six months. They found that when any formula milk is introduced into a breastfed infant’s diet within two weeks of beginning solid complementary foods, breastmilk intake decreases much more swiftly than when formula milk is not offered. As soon as two weeks after the introduction of infant formula the median change in breastfeeding frequency was -18%. However, it took eight weeks for the median change in breastfeeding pattern to reach -11% amongst the infants not fed formula milk. Formula feeding also resulted in decreases in suckling duration twice as large as those observed amongst infants fed only breastmilk. No difference in the velocity of these changes was observed to be related to the age at which formula milk was introduced. This suggests that formula milk replaces breastfeeding rather than supplementing it. The observation that the age at which formula milk is introduced is related to duration of breastfeeding strengthens the finding that the introduction of formula milk is a risk factor for premature breastfeeding cessation, which in turn increases the risk of adverse health events.

4 INFANT FEEDING PRACTICES

4.1 Methodological issues
Collecting data about infant feeding practices is plagued by a number of methodological issues, which render comparisons between studies and across time
difficult. A discussion of these issues is presented below to inform the review of infant feeding data that follows.

Of particular concern is inconsistency around the definitions of breastfeeding intensity. The definitions preferred by the WHO are illustrated in figure 2.1. Application of the term ‘exclusive breastfeeding’ is particularly problematic. In practice it can mean breastfeeding only and no other foods or fluids including water except vitamin/mineral supplements from birth as in the British, Canadian and American surveys, or it can mean breastfeeding only and no other foods or fluids including water except vitamin/mineral supplements in the last 24 hours as recommended in by the WHO and the Australian Department of Health and Ageing (Webb, Marks et al. 2001).

Although recommended by both the WHO and the Australian Department of Health and Ageing, the use of 24hr-recall data, sometimes referred to as ‘current status’ data, is known to result in large overestimates of the prevalence of exclusive breastfeeding (Aarts, Kylberg et al. 2000; Binns, Fraser et al. 2009; Bland, Rollins et al. 2003; Engebretsen, Wamani et al. 2007). One Swedish cohort study reported a discrepancy of over 40 percentage points between current status data and dietary intake recorded concurrently (Aarts, Kylberg et al. 2000).
### WHO Infant Feeding Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Must be fed</th>
<th>May also be fed</th>
<th>May not be fed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exclusive Breastfeeding</strong></td>
<td>Human milk*</td>
<td>Oral Rehydration Solution (ORS), drops and syrups**</td>
<td>Anything else</td>
</tr>
<tr>
<td><strong>Predominant Breastfeeding</strong></td>
<td>Human milk* as the predominant source of nourishment</td>
<td>ORS, water, water-based drinks (eg tea), fruit juice, ORS, ritual fluids, drops and syrups**</td>
<td>Anything else, particularly non-human milk, infant formula and other food based fluids</td>
</tr>
<tr>
<td><strong>Full Breastfeeding</strong></td>
<td></td>
<td></td>
<td>Exclusive breastfeeding + Predominant Breastfeeding</td>
</tr>
<tr>
<td><strong>Complementary Feeding</strong></td>
<td>Human milk*</td>
<td>Anything else: any food or liquid including non-human milk or formula</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Breastfeeding</strong></td>
<td>Human milk*</td>
<td>Anything else</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Bottle Feeding</strong></td>
<td>Any food fed from a bottle with a teat</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* whether from the mother or a wet nurse and including expressed milk from the mother or a donor and wet nursing ** vitamins, minerals or medicines *** in infants ≥ 6 months

However, the desire to measure the prevalence of exclusive breastfeeding from birth has led to the use of cross-sectional designs that require mothers of children up to five years old to remember when they first fed that child something other than breastmilk. Li and colleagues (2005) found that while maternal recall of the total duration of breastfeeding was quite accurate, the same could not be said of maternal recall of the age at which foods or fluids other than breastmilk were introduced. Only 58% of mothers were able to recall the age at which their babies were first fed foods other than breastmilk to within a month of that recorded in clinical records. Maternal recall of this event begins to deteriorate as soon as six months after the introduction of foods or fluids other than breastmilk. The NHS (Australian Bureau of Statistics 2003), NSW Health (Centre for Epidemiology and Research 2006), Health Canada (Statistics...
Canada 2008) and the CDC (Centers for Disease Control 2005) used cross sectional designs to collect data about the age at introduction of foods or fluids other than breastmilk from the mothers of infants 19 months to five years after the event, rendering this data particularly unreliable.

Thus the use of longitudinal design is preferable when the aim is to measure exclusive breastfeeding from birth. Only the UK National Health Service collected data in this way, asking mothers about breastfeeding and the introduction of foods or fluids other than breastmilk monthly for the first year.

The term ‘exclusive breastfeeding’ has also been applied inaccurately to describe breastfeeding and not receiving other foods or fluids including infant formula ‘regularly’ as in the NSW Health survey. Adding to the confusion, the NHS called this group, those infants who were breastfed and who did not receive other foods or fluids regularly, ‘fully breastfed’.

The time points used for each indicator also differ and there is a lack of clarity in the reporting associated with the use of prepositions such as ‘at’, ‘for’ and ‘to’. For example when women are encouraged to begin offering their babies complementary foods at six months, exclusive breastfeeding at six months may be very low, and not a particularly important indicator. However it may useful to measure and report exclusive breastfeeding to six months as an indicator of the reach of public health messages. Some studies appear to collect data using one indicator and report on another. In others it is not clear which indicator is used1.

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1 This problem was drawn to my attention by Deborah Hector in a personal communication.
4.2 Breastfeeding prevalence

Relatively few infants anywhere in the world are fed according to the recommendations of relevant public health authorities, and developed countries are no exception (Australian Bureau of Statistics 2003; Bolling, Grant et al. 2007; Centers for Disease Control 2005; Statistics Canada 2008). Table 2.1 compares the reported prevalence of breastfeeding in Australia, the USA, Canada and the UK.

Table 2.1 – Prevalence of breastfeeding in four countries

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>USA</th>
<th>CAN</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever BF</td>
<td>87%</td>
<td>91%</td>
<td>92%</td>
<td>73%</td>
</tr>
<tr>
<td>6 mos*</td>
<td>55%</td>
<td>57%</td>
<td>61%</td>
<td>47%</td>
</tr>
<tr>
<td>12 mos*</td>
<td>23%</td>
<td>28%</td>
<td>32%</td>
<td>20%</td>
</tr>
<tr>
<td>24 mos*</td>
<td>1%</td>
<td>3.6%</td>
<td>Not measured</td>
<td>Not measured</td>
</tr>
</tbody>
</table>

*any breastfeeding

While breastfeeding initiation appears to be approaching universality in Australia, only 60% of mothers who begin breastfeeding continue even to six months. Few mothers continue breastfeeding for 12 months or more and the proportion that continues to two years is negligible. The pattern in similar in Canada where most mothers begin breastfeeding but only 55% of them continue to six months and very few mothers continue breastfeeding to 12 months. In the USA, the pattern differs slightly. Although fewer mothers there initiate breastfeeding most (84%) of those who do continue to six months but, as in Australia and Canada, only a small proportion continue to 12 months. Breastfeeding prevalence is lowest in the UK. By six months only one in four British babies is breastfed. This might reflect the lack of a clear position on duration of breastfeeding amongst British health authorities.

4.3 Breastfeeding intensity in Australia

As the data on breastfeeding intensity are poor in quality and comparison between studies is not possible, these data will be reported separately and no attempt at
comparison will be made. Perhaps the only conclusions that can be drawn from these
data is that exclusive breastfeeding from birth to six months is rarely practiced in
Australia and that exposure to infant formula in the first year is likely to be near
universal.

The 2001 National Health Survey (NHS) reported that 54% of all children under three
years old at the time of the survey had been ‘fully breastfed’ at three months of age
and none had been fully breastfed at six months of age (Australian Bureau of
Statistics 2003). For the purposes of this study, ‘fully breastfed’ was defined as infants
who are breastfed but may have been given other liquids and medications but not
solid foods, non-human milks (including infant formula) or food-based fluids
regularly. As an infant was not considered to have ceased ‘full breastfeeding’ until
s/he was consuming non-human milks regularly, and ‘regularly’ was not defined, this
statistic is difficult to interpret.

NSW Health reported that 17.5% of children aged 0-4 years old in 2005/6 had been
‘exclusively breastfed’ at six months of age (Centre for Epidemiology and Research
2008). However, as noted earlier, the instrument used by NSW Health to collect this
data was not actually able to detect exclusive breastfeeding as defined by the WHO
because while it defined ‘exclusive breastfeeding’ as feeding with only breastmilk and
no water, juice or solids with the exception of medicinal drops or syrups, infants who
were fed foods or fluids other than breastmilk less than daily were included in the
exclusively breastfed group. Figure 2.2 contains the questions used to collect this
data. Across the state, 17.5% of 0-4 year olds were reported to have been
‘exclusively breastfed’ according to this definition at six months of age. It is also
unclear whether the data collected referred to feeding behaviour at six months or to
six months.
Infant and Child Nutrition in Queensland collected current status data on infant feeding practices using the WHO definition of exclusive breastfeeding (Gabriel, Pollard et al. 2005). Only 3.1% of infants five to less than six months old whose mothers responded to this survey were exclusively breastfed in the previous 24 hours. The pattern of current status data reported for this study suggests that exclusive breastfeeding is unusual for all but the youngest babies. Only 72.7% of infants less than a month old were exclusively breastfed in the 24 hours prior to the survey. Amongst infants one to less than two months old, 48.5% were exclusively breastfed and in the four to less than five months old group 14.3% were exclusively breastfed in the past 24 hours.

Only the Perth Infant Feeding Study II (PIFSII) collected longitudinal data using WHO definitions of breastfeeding intensity. This study found that only 1% of Perth infants was exclusively breastfed to six months (Scott, Binns et al. 2006b). This suggests that exposure to infant formula is very close to universal in Australia.

Figure 2.2 Infant feeding questions

<table>
<thead>
<tr>
<th>National Health Survey and NSW Health Infant Feeding Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has [child] ever been breastfed?</td>
</tr>
<tr>
<td>Is [child] currently being breastfed?</td>
</tr>
<tr>
<td>Including times of weaning, what is the total time [child] was breastfed?</td>
</tr>
<tr>
<td>Has [child] ever been given infant or toddler formula regularly*?</td>
</tr>
<tr>
<td>At what age was [child] first given infant or toddler formula regularly*?</td>
</tr>
<tr>
<td>Has [child] ever been given cow's milk regularly*?</td>
</tr>
<tr>
<td>At what age was [child] first given cow's milk regularly*?</td>
</tr>
<tr>
<td>Has [child] ever been given any other type of milk substitute** on a regular basis*?</td>
</tr>
<tr>
<td>At what age was [child] first given milk substitutes regularly*?</td>
</tr>
<tr>
<td>At what age was [child] first given solid food regularly*?</td>
</tr>
<tr>
<td>At what age was [child] first given fruit juice regularly*?</td>
</tr>
<tr>
<td>At what age was [child] first given water regularly*?</td>
</tr>
</tbody>
</table>

*Regularly was not defined for the NHS; NSW Health defined regularly as ‘at least once a day’; ** apart from breast milk/infant formula/cows milk *These questions were not asked for the NHS
4.4 Infant formula use in Australia

The use of infant formula is common in Australia and may be increasing. The 2001 NHS reported that the use of infant formula by breastfeeding mothers had increased since 1995 by around 60% (Australian Bureau of Statistics 2003). The actual statistics are not reported. However figure 2.3 illustrates the increase.

Figure 2.3- Proportion of infants aged 3 months or less currently breastfeeding and receiving formula and solids-1995 and 2001 (Australian Bureau of Statistics 2003)

NSW Health reported that 52.2% of children aged 0-4 years old in 2003/4 had been fed a breastmilk substitute (regularly) before six months and that the introduction of breastmilk substitutes prior to six months had decreased by more than 7% since 2001/2. These statistics are vastly different from those reported by the NHS, QLD Health and the PIFSII and should be interpreted very cautiously due to the error introduced by the inclusion of the definition of ‘regularly’ mentioned earlier in addition to the use of retrospective data collection (Li, Scanlon et al. 2005).

QLD Health found that the incidence of formula use in the previous 24 hours was high at all time points; for example, 22.7% of infants less than a month old had been fed infant formula in the previous 24 hours. That figure was almost double (41.2%) for infants who were aged one to less than two completed months old. More than two thirds (67.9%) of four to less than five month old infants were fed formula in the
previous 24 hours and amongst six to less than seven month old infants formula feeding approached universality (90%) (Gabriel, Pollard et al. 2005).

Although precise data on the prevalence of infant formula use in Australia are not available, the data that are available suggest that infant formula use is extremely common. It is likely that almost all infants are exposed to infant formula by six months of age. It also appears that although mothers value breastfeeding, they do not avoid formula feeding.

5 ADVERTISING AND INFANT FEEDING

Since Dr Cicely Williams drew the world’s attention to rising infant mortality associated with the advertising of artificial infant feeding products in 1939 (Baumslag 2005), there has been considerable concern about the potential for the promotion of infant feeding products, including infant formula, to bring about a decline in breastfeeding and a consequent increase in infant mortality and morbidity. This concern culminated in the adoption of the International Code of Marketing of Breastmilk Substitutes (WHA 34.22 1981) by the World Health Assembly in 1981 (Baumslag and Michels 1995; Palmer 2009; Richter 2001).

5.1 The International Code of Marketing of Breastmilk Substitutes

In 1981 the member states of the World Health Assembly (WHA) adopted the International Code of Marketing of Breastmilk Substitutes as a recommended minimum standard of regulation to ensure that breast milk substitutes are not promoted in ways that undermine breastfeeding (WHA 34.22 1981). The decision was almost unanimous; the United States of America was the sole dissenting vote and Argentina, Japan and the Republic of Korea abstained (Richter 2001). The International Code of Marketing of Breastmilk Substitutes (WHA 34.22 1981)
prohibits the advertising of infant feeding products\(^2\) when they are 'marketed or otherwise represented as a partial or total replacement for breast milk' (WHA 34.22 1981, Article 2). Its aim is 'the provision of safe and adequate nutrition, by the protection and promotion of breastfeeding and by the proper use of breastmilk substitutes, when these are necessary on the basis of adequate information and through appropriate marketing and distribution' (WHA 34.22 1981, Article 1). The Code prohibits the promotion of breastmilk substitutes directly to mothers; prohibits direct contact between company employees and mothers; and limits interactions between companies that sell these products and health professionals to the provision of 'scientific and factual information' only (WHA 34.22 1981, Article 7.2). The World Health Assembly (WHA) revisits the Code every two years in an effort to respond to changing marketing practices, environments and emerging research. Throughout this thesis the International Code of Marketing of Breastmilk Substitutes and subsequent related resolutions are referred to collectively as ‘the International Code’.

The WHO holds the view that advertising is likely to influence infant feeding behaviour – since companies, who are accountable to their shareholders, allocate large budgets to advertising infant formula products – and has declared that companies who wish to advertise infant feeding products are obliged to demonstrate that their advertising has no deleterious effect on breastfeeding (WHA47/1994/REC/1/ 1994).

5.2 Implementing the International Code

The International Code, including subsequent relevant resolutions, are instruments that have no binding legal status (Richter 2001). They do, however, confer a moral

\(^2\) including milk or infant formula, teas and other foods represented as suitable for infants less than six months old and infant feeding bottles/teats
obligation upon member states to give them effect. This obligation falls most heavily on those states who voted in favour of these resolutions, including Australia. Since 1981 many countries have taken steps to give effect to the International Code. A number of governments have enshrined the entire International Code in legislation, many have legislated to give effect to parts of the International Code and a great many more have implemented policy regulations or voluntary codes of practice in their attempts to fulfil their obligations to the international community on this matter (IBFAN 2006).

In Australia, a voluntary industry code of practice called the Marketing in Australia of Infant Formula: Manufacturers’ and Importers’ Agreement 1991 (MAIF Agreement) prohibits the advertising of any formula product represented as suitable for infants under a year old, including follow-on formula, by infant formula manufacturers and importers. Advertising of infant and follow-on formula by retailers is permitted and the MAIF Agreement does not apply to products other than infant or follow-on formula. There is no provision for active monitoring and there are no penalties attached to violation of the MAIF Agreement (Australian Government Department of Health and Ageing 1992).

The countries of the United Kingdom have given effect to the International Code by prohibiting the advertising of infant formula – that is those products 'suitable as sole nutrition for infants under 4-6 months old' – to the general public (Statutory Instrument 1995 No. 77). This statute does not affect the advertising of follow-on formula.

Neither the United States of America nor Canada has taken steps to implement the International Code. Neither restricts the advertising of infant formula at all. Thus infant formula is advertised freely in those countries (Palmer 2009; Richter 2001).
When national governments attempt to restrict the promotion of infant feeding products, their efforts are often met with resistance from infant formula manufacturing companies. In some countries this resistance has taken the form of simple disregard (Salasibew, Kiani et al. 2008) and in others obstruction (Duffy 2008; Mendoza 2010; Minchin 1998; Palmer 2009; Richter 2001). Recent attempts by the Government of the Philippines to strengthen restrictions on the marketing of infant formula (provisions included widening the definition of breastmilk substitute to include milk products suitable for children over a year old) were met with outright resistance in the form of a three year legal contest between the Government and the Pharmaceutical Health Care Association of the Philippines (PHAP) (representing the interests of multinational formula manufacturing companies in the Philippines) (Mendoza 2010; Rene 2008). Similarly the efforts of the Government of the United Kingdom in 2007 to tighten its restrictions on the use of health claims for any formula product and to outlaw the advertising of brands associated with infant formula were met with a high court challenge brought by the Infant and Dietetic Foods Association representing Nutricia; Heinz; Nestle and Wyeth (McNally 2008a, 2008b; Merrett 2007; Palmer 2009; Starling 2008).

5.3 The follow-on formula controversy
Since its ratification in 1981, some commentators have suggested that the wording of the International Code has allowed the infant feeding industry to define its scope (Greiner 1991). In particular there is concern that the phrase ‘when marketed or otherwise represented to be suitable … for use as a partial or total replacement of breastmilk’ might enable modification of promotional materials in ways that ameliorate the effects of the International Code in practice. This view has arisen from the observation that, in countries where measures have been taken to implement the
International Code, ‘follow-on formula’ (also called ‘follow-up formula’) began to be promoted more aggressively (Baumslag and Michels 1995; Palmer 2009; Popkin 1990).

It may be no coincidence that the first standard for the composition of follow-on formula was published in 1981 (ESPGHAN 1981), the same year that the International Code was adopted. More than one commentator has suggested that follow-on formula was invented for the purpose of evading the provisions of the International Code and associated national measures (Baumslag and Michels 1995; Palmer 2009). As follow-on formula is usually represented as suitable for infants at the age when complementary feeding is recommended in addition to breastfeeding, it has been argued that it escapes the definition of ‘breastmilk substitute’ and so can be freely advertised to mothers.

However, because these follow-on formulas are generally fed to infants using a feeding bottle and teat, they drew the attention of the WHA. As a result, in 1986 the World Health Assembly requested that the Director-General direct the attention of Member States to the position of the Assembly that ‘the practice being introduced in some countries of providing infants with specially formulated milks (so called ‘follow-up milks’) is not necessary’ (WHA 39.28 1986, para 3.2a).

The view that this ‘follow-up formula’ is marketed in ways that are devised to minimise the impact of the International Code on the marketing practices (and so sales) of Infant Formula Manufacturing Companies (IFMCs) was strengthened by the further observation that the free samples given to mothers by IFMCs through health clinics have often been replaced with samples of follow-on milk presented in packaging resembling that of infant formula so closely that the two might easily be

In response to continued concern about the marketing of follow-on formulas the WHA examined the practice in 1994 and issued a resolution urging member states to ‘[foster] appropriate infant complementary feeding practices from the age of about six months, emphasising continued breastfeeding …’ (WHA 47.5 1994). Two years later the World Health Assembly clarified the issue in a resolution that was more strongly worded, urging Member States to ‘ensure that complementary foods are not marketed in ways that undermine exclusive and sustained breastfeeding’ (WHA 49.15 1996, para 3.1). Recognising that confusion persisted around whether follow-on formulas fall within the scope of the International Code, and that these products could potentially be promoted in ways that undermine breastfeeding, in 2001 the World Health Organization encouraged governments to examine for themselves whether follow-on formula should be defined as a breastmilk substitute (World Health Organization - Nutrition for Health and Development 2001). In part, the statement reads,

*As WHO has already observed, on the assumption that follow-up formula is not marketed or otherwise represented to be suitable as a breast-milk substitute, strictly speaking it does not fall within the scope of the International Code. However, WHO has also made clear that, taking into account the intent and spirit of the Code, there would appear to be grounds for the competent authorities in countries to conclude otherwise in the light of the way follow-up formula is perceived and used in individual circumstances.*

Accepting that perception and use, rather than marketing practices, should define what constitutes a breastmilk substitute significantly broadens the scope of the International Code. Recent research from the UK suggests that consumers commonly understand advertising for follow-on formula to be advertising for infant formula (NOP World for Department of Health 2005). It appears that these consumers fail to
perceive any real difference between infant formula and follow-on formula, perceiving and using them both as breastmilk substitutes.

Similarities in the presentation of follow-on formula and infant formula (as illustrated in Figure 2.4) may contribute to consumers’ confusion. However, the International Association of Infant Food Manufacturers deny that follow-on formulas are breastmilk substitutes as defined by the Code, claiming that they are in fact complementary foods, ‘specially formulated for older infants for use as the liquid part of the weaning diet for infants after the age of four or six months’ (International Association of Infant Food Manufacturers 2008).

Figure 2.4 Milupa Aptamil First infant formula and Milupa Aptamil Follow-on (UK) (Aptamil 2005)

Notwithstanding the International Association of Infant Food Manufacturers’ assertions, research into the effects of complementary feeding practices on breastfeeding duration has found that any formula milk that is fed to a baby from a bottle supplants breastmilk. Hornell and colleagues’ (2001a; 2001b) research described above provides strong evidence that follow-on formula, even when intended as a complementary food, will quickly come to replace breastmilk in the diets of breastfed infants and so is, in fact, a breastmilk substitute. As such the advertising of follow-on formula should be considered to fall within the scope of the International Code.
5.4 The International Code and Toddler Milk Advertising in Australia

Since the introduction of the MAIF Agreement prohibiting the advertising of both infant and follow-on formulas, ‘toddler milks’ (also known as ‘toddler formula’, ‘growing-up-milk’, ‘GUM’ or ‘1-2-3 milk’) have been introduced to the Australian market. The presentation of these products displays an obvious similarity to that of follow-on formulas in that although toddler milks are modified powdered milk products not suitable for use as the sole diet of an infant, they are presented in packaging that is nearly identical to that of infant formulas. Toddler milk packages generally bear the same brand identifiers and design features as infant formula but include the word ‘toddler’ in the product name. For example, Wyeth produces infant formulas called ‘S-26 Gold Alpha Pro’ and ‘S26 Gold Progress’, and its toddler milk is called ‘Wyeth S-26 Gold Toddler’. Similarly, Nutricia produces infant formula called ‘Nutricia Karicare Gold Plus Infant Formula’ and toddler milk called ‘Nutricia Karicare Gold Plus Toddler’ (Figures 1 and 2).

A feature of the marketing of these products is that the brand identity common to a formula product range is emphasised on the packaging and in the advertising. Figure 2.4 shows that the word Aptamil, which is common to Numico’s British range of Aptamil formula milk products, is much larger than the text that differentiates the infant formula from the follow-on formula. The same phenomenon can be observed in Figures 2.5 and 2.6where the brand identifiers and design elements are much more salient on the packaging than the features that distinguish infant formula from toddler milk.
5.5 Advertising and infant feeding in the literature
A review of the literature was conducted to determine whether exposure to advertising for infant feeding products is known to affect infant feeding practices.

The literature addressing this issue is not confined to a single discipline. It is a topic that spans Medicine, History, Public Health, Nursing, Psychology, Economics, Marketing, Sociology, Anthropology and Gender Studies. Therefore no single search strategy was able to identify all the relevant articles. An initial search was conducted in Google Scholar using ‘breast’ or ‘bottle’ and ‘advert’ and ‘feed’ as keywords. The first 15 pages of results were examined and articles that addressed the effects of advertising on infant feeding practices or attitudes were identified. Only articles published in English were included. Eight articles addressing the research question were identified. This process was repeated using the related keyword set: ‘breastfeed’ or ‘bottle feed’ and ‘advert’, but no new articles addressing the topic were identified.
In addition, Medline, Cinahl, Cochrane and Proquest databases were searched using ‘infant feeding’, ‘bottle feeding’ and ‘breastfeeding’ as subject headings with OR used as the operator. These were combined with the keyword ‘advert$’ using AND as the operator. The searches were limited to articles published in English. Editorials, letters and comments were excluded. Qualitative research and reviews conducted before 2000 were also excluded.

This strategy yielded 211 articles in Medline; 455 articles in Cinahl; 14 articles in Cochrane and 33 in Proquest. These were examined for relevance to the research question and articles that addressed the effects of advertising on infant feeding were selected.

In addition, the ‘find related articles’ and ‘citing articles’ functions were utilised where these were available. Reference lists were also searched manually. Authors were contacted and asked to identify sources of research articles addressing the question. A number of articles were identified and supplied by colleagues with expertise in this area. As a result 34 articles were included in this review.

5.5.1 Effects of advertising on infant feeding

Much has been said about the influence of advertising and other promotional practices on infant feeding behaviour since Derrick Jelliffe first described 'commerciogenic malnutrition' amongst infants who were artificially fed in 1968 (Menon, Fazal et al. 2003, p163). In Jellife's view the advertising of infant milks was a significant contributor to the problem of rising infant mortality amongst the world's poor. Advertising is often suggested as a possible explanation for low rates of breastfeeding (see for example, Gottschang 2000; Gunasekera 2005; McVeagh 2002; Wilson 2001; Xu, Liu et al. 2006). There has, however, been surprisingly little direct empirical
investigation of the role that the advertising of infant feeding products plays in determining infant feeding practices. There are a few content analyses examining depictions of infant feeding in the mass media (Foss and Southwell 2006; Greiner 1975; Henderson 1999; Henderson, Kitzinger et al. 2000; Potter, Sheeshka et al. 2000). There are a number of studies examining the effects of promotional discharge packs on breastfeeding initiation and duration (Bennet 2006; Howard, Howard et al. 2000; Howard, Howard et al. 1994). There are also a handful of studies that examine the effects of exposure to advertising for infant feeding products on infant feeding practices in developing countries(Greiner 1975; Greiner and Latham 1982; Guilkey and Stewart 1995; Stewart and Guilkey 2000; Stewart, Popkin et al. 1991). There does not appear to be any published research specifically addressing the interaction between the advertising of infant, progress or toddler formulas and attitudes, perceptions or knowledge about infant feeding in developed countries.

The scarcity of research in this area may have resulted in part from the World Health Assembly’s statement that it is incumbent upon those who would advertise breastmilk substitutes to establish that doing so does not negatively impact breastfeeding practices (WHA47/1994/REC/1/ 1994). However, any attempts by advertisers to do this are likely to present an irreconcilable conflict with their interest in maximising the profits of their shareholders.

The research that has addressed the question of whether and how advertising and other promotional activities influences infant feeding behaviour has consistently found a small but significant relationship between mothers’ exposure to the advertising of infant formula brands and a decline in breastfeeding initiation, intensity or duration.
A longitudinal study conducted in the Philippines during the 1980s found that, amongst those who resided in rural areas, mothers who were able to recall seeing advertisements for infant formula were 5.8% less likely to intend to breastfeed and 1.6% less likely to be breastfeeding their babies after the second day of life (Stewart, Popkin et al. 1991). Mothers (both rural and urban) who were able to recall seeing advertising for infant formula were also more likely to be using infant formula or some other commercially available milk to feed their babies either exclusively or in combination with breastmilk at two, four and six months of age (Guilkey and Stewart 1995). Using statistical simulation, this study was able to conclude that if every woman in the sample had seen or heard an advertisement and received a free sample of infant formula, exclusive breastfeeding would be reduced from 60% to 50% amongst educated mothers, and from 90% to around 80% amongst less educated mothers. This result was confirmed in a later study demonstrating that the receipt of an infant formula sample reduced the duration of full breastfeeding amongst urban Filipinas (Adair, Popkin et al. 1993).

Similarly, in the Caribbean various advertising practices have been found to influence infant feeding practices. Greiner and Latham (1982) conducted a study in St Vincent that found a mother’s total breastfeeding duration decreased by 19 days for every infant food brand name she could recall. She would also introduce non-human milk three and a half days earlier for every brand name she could recall. Mothers who were more positively orientated towards advertised brands of infant foods than unadvertised brands also introduced non-human milks half a week earlier than those who were not.

A longitudinal study of 300 mothers who gave birth in a single hospital in Kingston, Jamaica found that 14% of mothers reported giving their babies non-human milk as a
direct result of the promotional activities of infant food companies (Grantham-McGregor and Beck 1970). While the advertising practices observed in this study are very different from simple exposure to mass media advertisements (such as being told to give the baby a bottle by an employee of such a company or being given a free sample) it does suggest that mothers can be persuaded by a variety of marketing strategies.

A small study conducted in Malaysia found that 65% of respondents had been influenced by receiving a free sample to buy a particular brand of formula milk (Suleiman 2001). Amongst this group of mothers, 72% said that they had found television advertisements for formula milk to be attractive. Moreover, more of these mothers reported that their choice of infant formula was the result of a recommendation from a friend (38%) than reported that their choice of feeding method was influenced by a doctor (32%). Although this is a very small study (n=50), it does suggest that advertising messages reach mothers both directly (television advertisements) and indirectly (via friends) and that these messages may be more influential than medical advice.

More recently, a retrospective study of 400 Vietnamese mothers found that a large proportion (75.0%) had watched more than ten television advertisements for infant formula broadcast from Thailand and almost half of them (48.8%) reported that their interest in buying infant formula had increased as a result (Putthakeo, Ali et al 2009).

Over the last two decades clear evidence has emerged which demonstrates that providing mothers who live in developed countries with samples of infant formula has an adverse affect on breastfeeding. Donnelly and colleagues' (2000) Cochrane Review concluded that receiving commercial material (with or without free samples of infant formula) on discharge from maternity hospitals reduced the incidence of
exclusive breastfeeding at 0-2 and 8-10 weeks and of any breastfeeding at all time points. The effect on exclusive breastfeeding was significant until 16 weeks but by six months no effect on exclusive breastfeeding was detected. This is most likely because health authorities in the UK and USA were recommending exclusive breastfeeding for 4-6 months at the time. Furthermore the prevalence of exclusive breastfeeding in the USA (Centers for Disease Control 2005) and the UK (Hamlyn, Brooker et al. 2002) at 4-6 months, where the included studies were conducted, was so low at the time (< 10%) that the sample sizes were not large enough to detect an effect at this time point.

The result of this review was recently replicated by a United States Government Accountability Office (USGAO) report to Congress addressing the effect of infant formula marketing on breastfeeding (Bennet 2006). The Office conducted a comprehensive literature search for empirical studies investigating the effect of infant formula marketing on infant feeding that had been conducted in the USA since 1980. It found 17 references that met the inclusion criteria and excluded five due to methodological limitations. The reviewers concluded that while there is good evidence that women who receive samples of infant formula in a medical setting are less likely to breastfeed according to national recommendations, only possible to provide a limited picture of the effects of the marketing of commercial breastmilk substitutes on breastfeeding because the remaining 12 papers all addressed a single marketing practice, the distribution of free samples of infant formula products, which will not be addressed in this thesis. The USGAO also concluded that little is known about the impact of other types of infant feeding product marketing on breastfeeding in developed world settings.
More recently, Rosenberg and colleagues’ analysis of data from the 2000 and 2001 Oregon Pregnancy and Risk Assessment Monitoring System, found that 66.8% of women who had initiated breastfeeding received commercial discharge packs containing formula samples and advertising from their health care providers. After adjusting for confounders, women who received these packs were more likely (AOR= 1.39) to have terminated exclusive breastfeeding by ten weeks than mothers who had not (Rosenberg, Eastham et al. 2008).

Other studies have investigated the effect of the implementation of the WHO’s Baby Friendly Hospital Initiative (BFHI) on breastfeeding outcomes. This initiative requires, amongst other measures, that hospitals adhere to the International Code by remaining free from commercial materials that promote infant feeding products. A large randomised controlled trial of the BFHI carried out in Belarus found that mothers who gave birth in BFHI hospitals breastfed for longer and introduced foods and fluids other than breastmilk later (Kramer, Chalmers et al. 2001). Although this effect cannot be attributed solely to the absence of advertising materials, it suggests that protecting mothers from the promotion of artificial feeding should be amongst the strategies used to improve infant feeding practices.

Giovannini and colleagues (2005) found that low adherence to the implementation of the International Code was associated with increased use of water-based supplementary feeding amongst fully breastfed infants while in hospital. Similarly, Murray and colleagues (2007) found slightly lower breastfeeding rates amongst mothers who received infant formula samples in hospital. Although this difference failed to achieve significance, this may be due to the use of the receipt of formula samples as an independent variable rather than birthing in a hospital that adheres to the International Code in its entirety. Mothers may have avoided receiving a sample
but still have been exposed to other materials advertising infant feeding products on
the ward. Certainly other health care systems have attributed improvements in
breastfeeding outcomes to the implementation of policies that included the
elimination of infant feeding product advertising (Bradley and Meme 1992; Popkin,

There is also some evidence that other advertising practices affect infant feeding
behaviour. Howard and colleagues (2000) randomised 547 women to receive either
infant feeding education packs created by infant formula manufacturing companies
that included infant formula advertising or an education pack designed specifically for
the project that did not include any infant formula advertising. After adjusting for
potential confounders, women who received the commercial materials about infant
feeding while pregnant were more than five times more likely to cease breastfeeding
before discharge from hospital and more than 10 times (OR = 10.3, \( p = 0.03 \)) more
likely to stop breastfeeding in first two weeks than women who received the research
materials. Receiving commercial education material shortened duration of both
exclusive breastfeeding and overall breastfeeding for women with uncertain
breastfeeding goals or breastfeeding goals less than three months.

5.5.2 Impediments to the study of the effects of advertising on behaviour

The size of the effects found in the studies cited above is probably less important than
the fact that an effect is identified at all, because detecting an effect of advertising
exposure on the behaviours or attitudes of a population that is saturated in advertising
is very difficult (Chapman 1993; Cherrington, Chamberlain et al. 2006). The
difficulties associated with detecting the effects of advertising have been most clearly
articulated by those interested in the relationship between tobacco use and the
advertising of tobacco products (Chapman 1986) but similar observations have been made by researchers with an interest in alcohol use (Cherrington, Chamberlain et al. 2006) and infant feeding (van Esterik 1996). A number of methodological limitations relevant to the area of infant feeding have been identified and are elaborated below.

First, and perhaps most importantly, advertising is understood by those who undertake it to be ‘of an investment nature, building up a fund of goodwill … that slowly decays in the absence of advertising but still yields influence’ (Chapman 1986, p36). Given the saturation of mass media generally and advertising in particular in contemporary industrialized societies it is impossible to compare the attitudes of a group of unexposed subjects with those who are exposed. Hodgetts and colleagues (2005, p126) describe efforts to measure immediate or short-term effects of a single form of advertising or mediated communication as futile ‘because media effects occur gradually across messages over extended periods of time’.

A number of researchers have turned their attention to the difficulty of measuring the effects of advertising on behaviour. Drawing on the work of Andrew Ehrenberg, Hoek & Gendell (2006) argue that while advertising may not persuade people to change their behaviour in the short term, its power is in the reinforcement of accepted, unhealthy behaviours.Ehrenberg & colleagues’(Ehrenberg, Barnard et al. 1997) argument is that advertising's most powerful role is to maintain brand salience in the minds of consumers and so to reinforce established buying behaviours.In this view, advertising of toddler milks in packaging that closely resembles that of infant formula would function as a tool to maintain the salience of infant formula brands in the minds of mothers, reinforcing established infant feeding patterns, normalising formula use and thereby undermining efforts to improve breastfeeding rates.
Renaud and colleagues (2006) propose a similar idea. They suggest that mass communications contribute to shared understandings of health and its determinants. The model they propose is built upon the empirical work of Yanovitzky and Striker (2001) in the field of alcohol use. These authors point out that the small effects that have been observed in individuals as a result of exposure to particular media messages are less important than the indirect influence of mass media on health behaviour that occurs through the revision and reinforcement of individual attitudinal or behavioural change through changes in social norms and policy agendas. That is, small effects on individuals are magnified through social interactions that in turn lead to changes in social norms and institutional policies and then further reinforcement via the mass media. These changes are difficult to measure.

Economic trend analysis supports Renaud and colleagues’ view. Smith (2007) examined the frequency with which print advertisements for infant formula products appeared in the Australian Women’s Weekly and the Medical Journal of Australia between 1950, when breastfeeding rates were high and the use of commercial infant feeding products was low, and 1980 when breastfeeding rates began to recover from their nadir in 1972. The results indicate that advertising for commercial baby milks increased seven fold in the decade from 1955 and peaked in 1970. Two years later breastfeeding rates would reach their lowest recorded level. This was accompanied by a concurrent increase in the sales of infant formula products. At the same time social policy change and shifting cultural norms were moving birth from home to hospitals where the rigidly structured hospital environment worked to undermine breastfeeding through strict feeding regimes, accommodating babies in central nurseries and routine complementary feeding. Advertisers were then in a position to exploit the resulting
epidemic of breastfeeding failure by distributing promotional materials, including free samples of infant formula, to mothers through hospitals.

Second, in the case of complex health behaviours such as tobacco use or indeed infant feeding, it is difficult to isolate the effects of advertising from the effects of other influences (Chapman 1986; Gerbner, Gross et al. 2002; van Esterik 1996). These influences are diverse and might include portrayals of infant feeding practices in the media (Henderson, Kitzinger et al. 2000), urbanisation (Vis 1978), employment and workplace practices (Gatrell 2007), attitudes and skills of health professionals (Kuan, Britto et al. 1999), cultural norms (Hauck and Irurita 2003; van Esterik 1996) and mothers’ interpretation of infant behaviour (Hill 1992). Isolating the effects of advertising would require examining the infant feeding behaviours of like populations under separated conditions; one group exposed to advertising and another group not exposed to advertising. This is clearly a practical impossibility.

However more than two decades of ‘cultivation analysis’ has demonstrated that exposure to mass media shifts people’s attitudes and beliefs. This body of research has found consistent divergence between the beliefs, attitudes and values held by those who are categorised as heavy television users and observable reality (Gerbner, Gross et al. 2002). Studies conducted in areas undergoing periods of rapid industrialisation where exposure to mass media is novel demonstrate that mass media messages shape attitudes and behaviours. The evidence suggests that mass media, including advertising has the power to shape or frame attitudes; to change cultural expectations and so to influence behaviour over a relatively short time period. These studies have demonstrated that the attitudes of people in areas where exposure to commercial mass media is novel, more closely reflect the attitudes depicted in the foreign media to which they are exposed than traditional attitudes and beliefs.
Becker and colleagues' (2002) prospective multi-wave cross-sectional study of the attitude of Fijian schoolgirls surveyed girls in the final three years of secondary schooling, using a 26-item eating attitudes survey (EAT-26). Sixty three girls were surveyed in 1995, less than a month after the introduction of television to the area, and 65 girls in 1998, three years after the introduction of television to the area. They found that exposure to commercial television was associated with increased unhealthy attitudes around eating and body image. Specifically, there was a 15% increase in scores that indicate disordered eating attitudes which were also correlated with disordered eating behaviours between 1995 and 1998. There was an increase in girls who reported inducing vomiting to control their weight from 0% in 1995 to 11.3% in 1998, and girls who lived in households with a television set were three times more likely to record EAT-26 scores associated with disordered eating.

Following the attitudinal study, Becker (2004) sampled 30 girls for a qualitative study exploring the girls' perceptions of the influence of exposure to television on their eating attitudes and body image. This study revealed that most of the girls interviewed expressed a desire to change their appearance, including body shape, to emulate the western characters they saw on television. Eighty three percent of these girls reported that television had influenced them or their friends to change their attitudes towards their body shape or weight.

In a similar study of the effect of media exposure on perceptions of risk, Kone and Mullet (1992) examined risk perceptions of 51 educated residents of Ouagadougou, the capital of Burkino Faso, who regularly viewed media content that originated from France, where actual risks differed significantly from actual risks present in Burkino Faso. They found that societal risk perceptions held by the residents of Ouagadougou (described as 'intellectuals' by the authors) were remarkably similar to
those held by people who lived in France (correlation = 0.852), despite 'extreme
differences in real risk structure' (p24). The authors suggest that their findings 'argue
in favour of a practically total determinant effect of media in risk perception' (p24).

In the area of infant feeding, African mothers who watched television every week
were 3.8 – 4.9 times more likely to feed their infants formula or milk than those who
did not. The authors comment that, '… even if a mother does not have the resources
to buy formula/milk, media advertisements for formula or milk, coupled with the
social environment can increase the pressure for using family resources for
purchasing these foods' (Ukwuani 2001, p15).

Third, it is difficult to determine the extent and importance of advertising exposure. It
is not clear whether the source or type of advertising affects the magnitude of its
influence or whether expenditure on advertising is a valid measure of its influence. It
must also be noted that not all advertising is of equivalent quality. Some advertising
campaigns are highly successful and other pass through communities largely
unnoticed (Chapman 1986).

Determining the magnitude of the influence of indirect advertising practices is
particularly challenging. In Australia the MAIF Agreement prohibits the direct
advertising of infant formula products. However the Agreement does not classify the
promotion of brands associated with infant formula products as advertising. These
indirect advertising practices include sponsorship of educational events or
conferences for health professionals or parents and the distribution of what might be
described as ‘educational materials’ for mothers that bear brands or logos associated
with infant formula. It is reasonable to assume that these practices have a positive
effect on the sales of infant formula products since the companies that produce them
expect to see a return for their investment in such promotions. However, it is difficult
to measure the magnitude of their influence on either infant feeding behaviours of mothers or the advice offered them by individual health care professionals.

Fourth, measuring the influence of advertising is complicated by doubts over the validity of self reported influence of advertising (Chapman 1986). Certainly it is possible for people to hold dispositions and yet to have no awareness of either holding those attitudes or of the causes of their attitudes (Petty, Priester et al. 2002). Furthermore mothers are unlikely to be willing to admit that their infant feeding decisions were influenced by advertising if questioned directly. Therefore, it may be more important that 3% of 200 Israeli mothers surveyed reported choosing their infant’s formula as result of having seen it advertised than that the other 97% did not (Nevo, Rubin et al. 2007). Similarly although the Infant Formula Council reported that their market research found that ‘Among those [mothers] who received infant formula samples in the hospital, 8 out of 10 said the samples had “no influence at all” in their decision whether to breastfeed or formula-feed their baby’ (International Formula Council 2009), it is probably more significant that 20% of these mothers reported that the samples did influence their infant feeding decisions.

5.5.3 Historical analysis of advertising and infant feeding trends

Historical analysis of infant feeding practices in developed countries has observed that the advertising of infant feeding products played an important role in the decline of breastfeeding and the concomitant rise of artificial feeding. In her history of the rise of artificial feeding in America between 1870 and 1910, Apple (1986, p23) observed,

… advertising campaigns for infant-formula products helped make artificial feeding respectable and acceptable in American society. They encouraged more wide-spread use of bottle feeding and thus formed the basis of today's infant-formula pharmaceutical industry.
Apple (1987) observed that although the development of artificial infant feeding products was initially driven by concern to reduce mortality rates amongst orphaned and abandoned infants, these products soon came to be marketed in competition with breastfeeding for routine use. She attributes this shift primarily to the relationship forged by producers and advertisers of breastmilk substitutes with doctors, notably those affiliated with the emerging specialty of paediatrics (also Greer and Apple 1991).

Although remarking that nurses played a more significant role in advising Australian mothers on the care and feeding of their infants than doctors, Thorley’s (2008) history of infant feeding in Australia during the 20th Century also observes the important role played by advertising and other promotional activities in the rise of artificial feeding and the resultant decline of breastfeeding. She points out that the historical evidence (such as articles, advertisements and letters printed in women’s magazines) suggests that mothers’ infant feeding behaviour was most strongly influenced by advice that offered immediate solutions to the perceived problems associated with caring for an infant and that advertisers generally offered this sort of panacea. Importantly this advice often contradicted health promotion policies and messages, which tend to take a long term view of the health sequelae of infant feeding. Her analysis of advertising materials notes that advertisers were skilled at exploiting ‘mothers’ anxieties for the purpose of promoting an alternative product as a solution’ (Thorley 2008, p 16).

Thorley also observed that advertisements for infant feeding products during the 20th century were characterised by a small number of enduring themes. As early as the turn to the 20th Century until as recently as 1997-8 (even though the MAIF Agreement (Australian Government Department of Health and Ageing 1992) prohibited such claims) the idea that infant feeding products (including but not always limited to milk
foods) offered ‘an equivalent or superior substitute for mother’s breast’ characterised advertising materials. This message became so widely accepted that by the early 1980s educational materials published by state health services were presenting breastfeeding and artificial feeding as ‘equal choices with equal space given to each’ (Thorley 2008, p 163).

6 ATTITUDES PREDICT INFANT FEEDING BEHAVIOUR

6.1 Attitudes and behaviour
Attitudes are said to determine behaviour via intention. According to the Theory of Reasoned Action, intentions are the direct determinants of behaviour and intentions are determined by a combination of attitude toward the behaviour and subjective norms. Attitude toward behaviour is a person’s positive or negative evaluation of performing the behaviour and social norms are the individual’s perception of social pressures that bear on him or her to perform or not perform the behaviour. According to this theory people intend to behave in a given way when they believe that doing so will result in positive outcomes (attitude towards the behaviour) and that doing so will win approval (or avert sanction) from others whose approval or disapproval is important to them (social norms) (Fishbein 1980). In recognition that behaviours are rarely subject to complete volitional control the theory has been modified to include the concept of perceived behavioural control as a third determinant of intention and as a direct determinant of behaviour (Ajzen 1991).

6.2 Search strategy
In order to determine what is known about the relationship between attitudes about infant feeding and infant feeding behaviour, the Medline and Cinahl databases were searched using the subject headings ‘breastfeeding’ OR ‘bottle feeding’ AND keyword ‘attitude$’. Results were limited to articles published in English since 2004.
Reports of research studies conducted in developing world contexts and those conducted amongst minority ethnic populations (such as African-American, Maori, adolescent or Hispanic-American mothers) were excluded because it is not clear that their results can be applied to Australian mothers. Editorials, letters and comments were also excluded.

Five hundred and thirty-six articles were retrieved from Medline using ‘breastfeeding’ and ‘attitude$’. One hundred and forty-four articles were returned using ‘bottle feeding’ and ‘attitude$’. Four novel citations were identified. Reference lists were searched by hand. Ninety-one citations were retrieved from Cinahl using this strategy. These were examined for relevance to the research question and articles that included initiation of breastfeeding or formula feeding and/or duration of breastfeeding as dependent variables were identified. Sixteen articles were included in this review.

6. 3 Attitudes and infant feeding outcomes
Several instruments have been designed with the intention of measuring psychosocial characteristics of mothers and these generally reflect the constructs described by the Theory of Planned Behaviour, such as beliefs about breastfeeding and formula feeding (attitude towards breastfeeding or formula feeding), breastfeeding self-efficacy (perceived behavioural control) and subjective norms around infant feeding.

Although the application of theoretical frameworks and the methodological quality of these studies is inconsistent (Chambers, McInnes et al. 2007), their results are remarkably consistent; together they comprise a significant body of evidence demonstrating that psychosocial characteristics including attitudes exert an important influence on infant feeding behaviour at every point along the causal pathway. Intention, initiation of breastfeeding, initiation of formula feeding and total duration
of breastfeeding are all influenced by attitudes towards breastfeeding and formula feeding.

6. 4 Breastfeeding attitudes
Positive attitude towards breastfeeding, measured using the Iowa Infant Feeding Attitude Scale (IIFAS)(De la Mora, Russell et al. 1999) has been found to predict breastfeeding initiation and duration amongst Australian, British and Irish mothers after controlling for socio-demographic characteristics (Dungy, McInnes et al. 2008; Scott, Binns et al. 2006a; Scott, Binns et al. 2006b; Scott, Shaker et al. 2004; Shaker, Scott et al. 2004).

Relationships between self-efficacy and breastfeeding outcomes have been observed. Blythe and colleagues (2004) found that mothers with high antenatal breastfeeding self-efficacy scores were more likely to be breastfeeding at both one week and four months. Similarly Baghurst and colleagues (2007) found that hazard ratios (where the hazard is cessation of breastfeeding) at six weeks, three months and six months decreased dramatically with increasing prenatal self-efficacy scores and that controlling for socio-demographic variables strengthened the association. Kronberg and Væth (2004) found that breastfeeding self-efficacy and confidence in milk supply (as well as intention and education) were significantly associated with duration of predominant breastfeeding (defined as \( \leq \) once weekly formula use). McCann and colleagues (2007) found that breastfeeding self-efficacy and confidence in milk supply were independently associated with duration of predominant breastfeeding (also defined as receiving formula \( \leq \) once/week). Self-efficacy also emerged as an important determinant of ‘exclusive breastfeeding’ duration in a study of 132 Canadian mothers (Semenic, Loiselle et al. 2008). However, it is not clear what this study actually measured since ‘exclusive breastfeeding’ was not defined and ‘in-
hospital formula supplementation’ was listed amongst the predictors of duration of exclusive breastfeeding.

6.5 Formula feeding attitudes
Formula feeding attitudes may be more important predictors of infant feeding outcomes than breastfeeding attitudes. Lewallen and colleagues (2006) found that the postnatal attitudes towards breastfeeding held by mothers who had ceased breastfeeding by eight weeks did not differ from those held by mothers who had not. It seems likely that these women do not perceive the decision to initiate formula feeding as a decision to cease breastfeeding.

Although the IIFAS lacks the specificity required to differentiate between respondents who hold both strongly positive attitudes about breastfeeding and strongly positive attitudes about formula feeding and those who have moderately positive attitudes about breastfeeding, low IIFAS score, indicating strongly positive attitudes towards formula feeding, was associated, negatively, with both initiation of formula feeding (cessation of full breastfeeding) before six months and cessation of any breastfeeding before 12 months (Scott, Binns et al. 2006b). This result is consistent with Scottish research which found that behavioural beliefs about bottle feeding, but not about breastfeeding, predicted infant feeding behaviour at six weeks post partum (Swanson and Power 2005); and American research which has found that mothers who are themselves more comfortable with formula feeding or who perceive their families to encourage bottle feeding are much more likely to feed their babies infant formula (Khoury, Moazzem et al. 2005; Nommsen-Rivers, Chantry et al. 2010).

Furthermore Kools and colleagues (2005) found that multiparous women without previous breastfeeding experience initiated breastfeeding at only half the rate of other women. Although this effect disappeared after the attitudinal variables entered the
model, it is not insignificant. Women from this group are experienced formula feeders so it is unsurprising that they have favourable attitudes towards formula feeding. This result supports the notion that comfort or familiarity with formula feeding is an important determinant of the initiation of formula feeding.

6. 6 Why women breastfeed
Brodribb and colleagues’ (Brodribb, Fallon et al. 2007) interviewed 562 Australian mothers and asked them to identify the reasons they chose to breastfeed their babies. The most common reasons given were ‘breastfeeding is better for my baby’ (95.5%) and ‘breastfeeding enhances my baby’s immunity’ (91.6%). Almost three quarters (74%) said they chose breastfeeding because it ‘helps prevent allergies’ and 30.4% said that knowing that ‘breastfeeding enhances intelligence’ influenced them to choose breastfeeding for their babies. These mothers also commonly cited benefits of breastfeeding for mothers, such as convenience (83.4%), cost (70.8%) enjoyment (69.7%) and weight loss (50.9%); a moral imperative, ‘breastfeeding is the right thing to do’ (60.4%); and the influence of others such as the preference of a partner (33.0%), advice from a nurse (23.2%), mother’s mother (17.5%) or doctor (11.4%).

6. 7 Implications
Large and small studies, studies that controlled for socio-demographic characteristics of parents and those that did not, studies conducted amongst women of low socio-economic status and those conducted amongst the general population of mothers have all found relationships between attitudes and infant feeding behaviours. None of the studies identified for this review and published in the last five years failed to detect a relationship between attitudes and infant feeding behaviour. Although this introduces the possibility of publication bias, the fact that many of these studies collected data about variables other than attitudes suggests that publication bias is not a significant
problem, since studies that found no effect of attitudes on infant feeding outcomes could have reported effects of other variables such as socio-demographic variables. It is clear, then, that infant feeding attitudes are important determinants of infant feeding outcomes.

The focus of the research in this area has been breastfeeding initiation and continuation over a very short period, usually six to eight weeks, perhaps for reasons of utility. This review found only two studies that investigated the relationship between attitudes and the initiation of formula feeding and only one of these measured this explicitly. Since almost all Australian mothers initiate breastfeeding, the prevalence of mixed feeding appears to be increasing dramatically and there appears to be a dose relationship between exposure to infant formula and adverse health outcomes, research and promotional efforts should now address the factors that predict initiation of formula feeding.

7 ADVERTISING INFLUENCES ATTITUDES AND BEHAVIOUR

Although the role of advertising in the formation, alteration and maintenance of health related attitudes and behaviours is not simple (Chapman 1986, 1993; Gerbner, Gross et al. 2002), there is compelling evidence from other public health arenas that commercial advertising influences both attitudes and behaviour (Brown and Walsh-Childers 2002).

The evidence is perhaps clearest on the issue of tobacco advertising (Lovato, Linn et al. 2003; Saffer 2000). A number of studies have demonstrated that advertising plays an important role in the initiation of smoking (DiFranza, Wellman et al. 2006) and that the most popular brands are those that are the most heavily advertised (Pierce, Gilpin et al. 1991; Vickers 1992). Furthermore, some studies indicate that advertising
is a more important influence on smoking behaviour than having peers and family 
members who smoke (Brown and Walsh-Childers 2002; Evans, Farkas et al. 1995). 
Exposure to advertising for tobacco products changes young people’s attitudes about 
smoking leading them to view smoking as ‘normative, glamorous and risk free’ 
(Krugman, Quinn et al. 2005).

Similar relationships have been found between alcohol advertising and positive 
attitudes about alcohol use (Austin, Chen et al. 2006; Casswell 1995; Chen, Grube et 
al. 2005; Grube and Wallack 1994; Jones and Donovan 2001). Positive regard for 
alcohol advertising appears to be related to more positive beliefs about drinking 
alcohol and to increased consumption of alcohol (Saffer and Dave 2006; Wyllie, 
Zhang et al. 1998). Furthermore the effects of exposure to alcohol advertising and 
promotion may be quite durable; results from one very large study that controlled for 
reciprocal effects suggest that exposure to alcohol advertising in childhood predicts 
drinking behaviour in adolescence (Smith, Foxcroft et al. 2009).

It has been observed that attempts to measure the effects of alcohol advertising on 
alcohol use patterns are likely to underestimate the relationship (Austin, Chen et al. 
2006; Smith, Foxcroft et al. 2009) perhaps because traditional quantitative or 
positivist approaches fail to account for the powerful social, cultural and 
psychological milieu in which both advertising and drinking occur (Casswell 2004; 
Gerbner, Gross et al. 2002; McCreanor, Greenaway et al. 2005).

Evidence that advertising affects children’s attitudes about food is also accumulating. 
Advertising appears to affect children’s food preferences (Story, Neumark-Sztainer et 
al. 2002; Taylor, Evers et al. 2005), encouraging them to prefer or request that their 
parents purchase foods that are heavily advertised such as sweetened breakfast
cereals, soft drinks, fast foods and snacks that are high in salt, saturated fat or sugar (Signorielli and Lears 1992; Signorielli and Staples 1997; Taras, Sallis et al. 1989).

There is also evidence that advertising increases consumer demand for prescription medications (Gilbody, Wilson et al. 2005; Peyrot, Alperstein et al. 1998; Polen, Khanfar et al. 2009; Wilkes, Bell et al. 2000). Physicians are more likely to prescribe medications when patients request a medication they have seen advertised even when they are not convinced they represent the best possible treatment option (Mintzes, Barer et al. 2002).

Given that mere exposure to a stimulus such as advertising is known to exert a powerful influence on the formation of attitudes (Crano and Prislin 2006), it is hardly surprising that advertising has been found to influence attitudes around a variety of health behaviours. Importantly, this influence is amplified by repeated exposure, as is invariably the case with advertising, and can occur without conscious engagement with the stimulus. Furthermore the effect is most pronounced amongst those who hold neutral or weak positive attitudes toward the product, service or action that is being promoted (Crano and Prislin 2006). This suggests that advertising for infant formula products or brands is likely to have most influence with mothers who are unaware that there are important health risks associated with infant formula use.

8 CONCLUSION

It is generally recommended that infants be exclusively breastfed for the first six months of life and continue breastfeeding with the addition of nutritionally adequate complementary foods into early childhood. However this pattern of infant feeding is rarely observed. Infant formula use is so common in Australia, as it is in other developed countries, as to be ubiquitous.
Poor infant feeding practices have serious health implications for both infants and their mothers. As well as truncating breastfeeding, exposure to infant formula damages infants’ gastro-intestinal environments making them more susceptible to infection. Thus it is not surprising that formula feeding is an independent risk factor for hospitalisation in the first year in the developed world.

Although demonstrating the effects of advertising is problematic, there is evidence that advertising adversely affects infant feeding practices.

The International Code is an attempt at protecting mothers and infants from the promotion of infant feeding products including infant formula. However the efforts of national governments to restrict the advertising of infant formula have resulted in increased promotion of other formula milk products such as follow-on formula and toddler milk. The similarity in presentation between these products and infant formula suggests they might be part of a deliberate strategy to circumvent prohibition of the advertising of infant formula.

There is also evidence that advertising influences attitudes towards other health behaviours, and attitudes are known to determine behaviour via intentions. The following chapter outlines the methodology employed to investigate the relationship between toddler milk advertising and attitudes toward both breastfeeding and formula feeding.
Chapter Three

Methodology

This chapter describes and defends the methodological decisions taken in the design of the project. Section one provides an overview of mixed methods research and demonstrates its applicability to the research question. Following this, the choice of a concurrent convergence design is described and justified. Sections two through five describe the four individual studies and their contributions to the project as a whole.

1 MIXED METHODS

1.1 Philosophical framework – What is mixed methods research?
Mixed methods research is founded on a set of ideas collectively known as ‘pragmatism’ (Creswell and Plano-Clark 2007; Takkashori and Teddlie 1998). This foundation enables researchers to combine research designs that have previously been understood to be incompatible because their philosophical assumptions differ markedly (Morgan 2007).

Although a variety of philosophical assumptions are used to inform social research, two have dominated discussions of research methodology and these are the two that are most relevant to this study. Critical examination of quantitative research (or ‘Scientific Method’) has revealed that it is generally characterised by a world-view\(^1\) that assumes the existence of a reality or truth, which can be observed or discovered through impartial measurement carried out by unbiased observers using deductive methodologies and reasoning. Qualitative research, on the other hand, is generally characterised by a constructivist world view which holds that reality or truth is

\(^1\) often referred to as ‘positivist’ or ‘post-positivist’ by its critics but rarely afforded this label by its proponents or practitioners
constructed or negotiated by those who experience it and that there may be multiple versions of reality or truth which are best observed by researchers who participate in the phenomenon of interest, are aware of and accept their own biases (since bias is unavoidable) and use inductive methodologies.

Pragmatism brings these two world views, and at times numerous others, together. It proposes a world-view which accepts both the notion that there exists an observable reality and the idea that there may be various interpretations or experiences of that reality. This leads to an approach to research that is guided primarily by utility. It is focussed on assessing what kinds of data are most likely to address research questions which are oriented towards solving practical problems. It requires that researchers adopt varying positions (intersubjectivity) on the question of bias; at times accepting and exploiting bias, sometimes to the extent of participating in the observed phenomena, and at times seeking objectivity. A pragmatic approach to research inquiry enables researchers to combine deductive and inductive methodologies, moving ‘back and forth between induction and deduction – first converting observations into theories and then assessing those theories’ (Morgan 2007, p 71).

Thus mixed methods research collects and integrates qualitative and quantitative data in order to produce socially meaningful and practically useful knowledge (Feilzer 2010).

1.2 The choice - Why mixed methods?
Combining qualitative and quantitative methodologies enables researchers to bring together the strengths of these methods and mitigate their weaknesses. Specifically, while quantitative data can provide insight into the prevalence of certain phenomena or establish correlations between established variables often referred to as ‘breadth’, they commonly lack detail or ‘depth’ and are unable to identify novel influences on
behaviour; and while qualitative data can provide an opportunity to explore complex attitudes, motivations and behaviours, the limited sample sizes necessitated by this sort of data collection mean that qualitative data cannot by itself establish the applicability of the findings to wider populations.

For example, quantitative data can gauge the frequency with which toddler milk advertisements appear in certain environments but they cannot tell us what mothers understand these advertisements to be telling them or how influential the ideas communicated by advertising might be; and while qualitative research can offer a deeper understanding of mothers’ understandings of certain advertisements, it cannot gauge the frequency with which such advertisements appear or establish whether the views expressed by the mothers interviewed are common amongst all mothers.

1.3 The design
This project aimed to investigate whether toddler milk advertising promotes formula feeding amongst Australian parents. In recognition that neither qualitative nor quantitative data would be sufficient by itself to address the research question, a mixed methods triangulation design was chosen. Specifically, a concurrent convergence model was selected. This model is characterised by the concurrent collection of qualitative and quantitative data which are then synthesised (converge) at the level of interpretation. In this model quantitative and qualitative data are afforded equal weight in the design. This approach is best suited to research where the intention is to draw valid conclusions about a complex research problem by approaching the issue from a variety of perspectives.

The project comprised four separate studies, each of which was designed to address an aspect of the overall research question. Although they were conducted concurrently, they are labelled sequentially to facilitate reporting. Study One used a
qualitative design to examine mothers’ responses to print magazine advertisements for three brands of toddler milks. Study Two utilised content analysis to determine whether prohibition of the advertising of one or more formula milk products (such as the prohibition of follow-on formula and/or infant formula) had an effect on the frequency with which advertising for formula products or brands appeared in parenting magazines during 2007. Study Three investigated whether there was any correlation between parents’ apparent exposure to toddler milk advertising and their views about the use of infant formula. Study Four employed discussion group interviews to explore the role advertising played in informing the advice given to mothers by health professionals, other mothers and mothers’ mothers.

Together the data collected were expected to enable the researcher to draw conclusions about the influence of toddler milk advertising on attitudes and beliefs about infant feeding.

2 STUDY ONE – IT’S ALL FORMULA TO ME

Semi-structured interviews focussed on print advertisements for toddler milk were used to examine expectant mothers’ understandings of toddler milk advertisements. A purposive sample of mothers expecting a first baby were shown a print advertisement for toddler milk. Think Aloud Technique (Ericsson and Simon 1998) was used to elicit participants’ understandings of the messages communicated by the advertisement, including the nature and purpose of the product advertised. The design of this study was informed by Encoding/Decoding Theory (Hall 2001).

The discipline of Media Studies has long since abandoned the idea that mass media simply 'injects' its messages into a passively receptive – and obedient – audience (Morley 1992). In response to the notion that the relationship between mass media
exposure and attitudes or behaviour is a simple cause/effect relationship, Katz &
同事们 (1973) developed an interactive model of media use, known as the 'uses
and gratifications' model. This model takes account of the individual, social and
psychological needs of mass media consumers, acknowledging that people can take
an active role, not only in choosing their mass mediated content but also in choosing
how they will use it. In a study of television quiz show viewing, McQuail &
同事们 (1972) observed that for some viewers watching these programmes served
an educational function while for others viewing facilitated social interaction either
through competition with other viewers present at the time or by providing a source of
conversation for future social interactions. According to this model, mothers who
read parenting magazines might use advertising as a source of information about
infant feeding, a stimulus for conversation with other mothers, or perhaps a
benchmark by which to measure their own infant's behaviours.

More recently, however, this model has been criticised as optimistic and politically
conservative because it foregrounds (and possibly exaggerates) the active and
conscious choices made by individuals while paying little attention to the – perhaps
more powerful and usually less conscious – socio-cultural influences on people's
interpretations or readings of mass communications. In doing so, this model appears
to neglect the often invisible persuasive power of the mass media.

This observation has lead to a shift in focus amongst media researchers from why and
how people use mass communications to what people see in or 'read' from the mass
communications or 'texts'. This theoretical approach, first described in the 1970's and
called 'encoding/decoding' (Hall 2001), has borrowed heavily from disciplines that are
informed by semiology, most notably 'Reader Response Theory' (Tompkins 1980),
which was first concerned with interactions between readers and literary texts.
Encoding/Decoding Theory focuses on the meanings produced as mass communicated texts are 'read' or interpreted and observes that for any given text or message a variety of readings will be possible. Importantly, features of the text itself, such as the chosen medium and signifiers, will 'prefer' or 'privilege' certain readings and marginalise others (Hall 2001; Morley 1992). According to this model, advertising texts might prescribe or suggest the health issues that ought to concern mothers of young children – and present a product to alleviate those concerns.

Encoding/decoding research utilises data collection and analysis strategies borrowed from ethnographic research. It focuses on observing readers as they read or decode mass mediated messages and is characterised by the use of semi-structured interviews – commonly in group settings - and emergent coding strategies. It recognises that texts make meaning within semiotic and sociocultural contexts, invoking and either reinforcing or challenging ideologies shared by the intended readers (Hall 2001). In the case of an advertising text, this model might examine how the text and graphics operate by invoking, reinforcing and/or challenging dominant ideologies around health, gender, or in the text under examination here, motherhood.

3 STUDY TWO – THE ADVERTISEMENTS YOU HAVE WHEN YOU’RE NOT HAVING ADVERTISEMENTS

Krippendorff (1980, p21) defined content analysis as ‘a research technique for making replicative and valid inferences from data to their context’. It is commonly used to reveal international variations in communication content and is often applied to mass communications such as advertising. While the use of content to disclose context is the defining feature of content analysis, a variety of techniques can be employed (Weber 1990).
In order to determine whether the regulatory context resulted in differences in the frequency with which advertisements for formula milk products or brands appeared in parenting magazines, a simple quantitative content analysis strategy was selected. The frequency with which formula milk or formula brand advertisements appeared in Australian parenting magazines was compared with the frequency with which they occurred in parenting magazines that originated in countries with different regulations governing the advertising of infant and/or follow-on formula products. Instances of formula advertising were identified as coding units. In order to facilitate comparisons between magazine titles that varied considerably in size (number of pages per issue) and publication frequency, the frequency with which formula advertising appeared in parenting magazines was expressed as a ratio of the instances of formula advertising to pages of any advertising. This strategy has been used before to examine the effects of advertising bans on incidental depictions of tobacco advertising in consumer magazines (Chapman, Jones et al. 1995). Content analysis has been used extensively to examine the effects of advertising bans patterns of tobacco advertising of tobacco in consumer magazines (eg, Chapman, Jones et al. 1995; Hamilton, Turner-Bowker et al. 2002; King and Siegel 2001).

4 STUDY THREE – LOOK AT THAT. IT DOES GET IN!

Given that this study was concerned with the relationships between a number of attitudinal variables that occur simultaneously, a cross sectional design was considered appropriate (Aday and Cornelius 2005). Parents of children less than five years old were surveyed using a novel instrument. Attitudes about breastfeeding and formula feeding (the dependant variable) were measured using 22 statements scored on a five point likert scale (strongly agree to strongly disagree). Exposure to advertising for infant formula products, including toddler milks (the independent
variable), were also measured. Respondents’ experiences of infant feeding and their perceptions of the practices of their friends as well as their awareness and acceptance of infant feeding recommendations were considered possible confounders and these were also measured.

Exploratory factor analysis was used to reduce a large set of attitudinal variables to a smaller set by finding common or latent factors amongst them and generating factor scores which could then be entered into a multiple linear regression equation (Hair, Anderson et al. 1998; Punch 2005; Tabachnick and Fiddell 1996).

Multiple linear regression (MLR) is a powerful and flexible statistical tool that enables researchers to determine whether change in one independent variable is associated with change in another dependent variable in the presence of one or more additional variables. The strength of MLR is that it can identify the variance in the dependent variable that occurs for each one unit change in a single independent variable while holding all the other variables constant. This enables the researcher to achieve a statistical approximation of a situation in which the comparison groups are identical on all variables except the variable of interest, thus isolating the relationship between a single predictor and the dependent variable (Hair, Anderson et al. 1998).

Given that infant feeding attitudes are known to be complex and influenced by a variety of issues, MLR was used to examine the influence of self reported exposure to toddler milk advertisements on attitudes about infant feeding while controlling for a number of other variables.

5 STUDY FOUR – RELAX! YOU’RE SOAKING IN IT.”

This study used a series of discussion fora to explore the role formula advertising played in informing the advice given to new mothers about infant feeding by health
professionals, other mothers and mothers’ mothers. A purposive sample of mothers, grandmothers and health professionals (Child and Family Health Nurses, a GP and a Dietician) were recruited and interviewed in small groups. Each group was asked what the mothers they are acquainted with, or work with, know about infant formula, where those mothers source their information, what information is available to them and their own brand awareness was explored. Print advertisements for toddler milks that had been collected during the course of study one were used to stimulate further discussion between the participants. Framework analysis was used to discern patterns in the responses. Data collection and analysis were conducted simultaneously until saturation had been reached for each of the themes.

Group discussions were used because they are known to be capable of generating ‘a rich and detailed set of data’ about people’s knowledge and experience (Stewart and Shamdasani 1990, p140). The strength of this strategy is that it enables the researcher to observe interactions between participants and enables participants to refine their ideas in response to comments made by others (Liamputtong and Ezzy 2005).

6 SUMMARY

This chapter outlined the choice of a concurrent convergence (mixed methods) design in which each of four studies are conducted concurrently, afforded equal weight and synthesised at the level of analysis (Chapter Nine). The four chapters that follow describe the data collection, analysis and results of each of the four studies conducted for this project.
Chapter Four

Study One: “It’s all formula to me”

This chapter reports the conduct, analysis and results of the first of four studies that will be synthesised at the level of interpretation in Chapter Nine. The study used in depth interviews to explore participants’ understandings of toddler milk advertisements.

1 INTRODUCTION

In order to determine whether toddler milk advertising might function as indirect advertising for infant and follow-on formula, a qualitative design was used to explore mothers’ decoding processes in response to print magazine advertising for three brands of toddler milks. Semi-structured interviews with women expecting a first baby were undertaken to examine what they believed advertisements for toddler milks were trying to communicate to them and how they responded to those messages.

Since research has demonstrated that mass media does not have a simple causal relationship with behaviour, this study was informed by encoding/decoding theory, which is characterised by the use of semi-structured interviews and emergent coding strategies. It recognises that texts create meaning within semiotic and socio-cultural contexts, invoking and either reinforcing or challenging ideologies shared by the intended readers (Gerbner, Gross et al. 2002; Morley 1992; Seale 2002). In the case of advertising texts, this approach can be used to examine how text and graphics operate by invoking, reinforcing and/or challenging dominant ideas, fears or beliefs around a health issue such as infant feeding (Chapman 1986; Seale 2002).
2 MATERIALS AND METHODS

2.1 The stimuli
Full page toddler milk advertisements were collected from a sample of Australian parenting magazines published during 2006/7 including *Woolworths Parents*, *Australian Practical Parenting*, *Sydney’s Child* and *Coles Baby*. Six advertisements were identified from the sample. Initial analysis revealed that all of the advertisements used one of three distinct advertising strategies described by Rossiter and Bellman (2005). One example of each strategy was chosen for use in this study. Advertisements that originated from multinational companies were chosen because they were likely to have been comprehensively tested and effectively executed. Copies of the advertisements are provided in figures 4.1 to 4.3 and are described below.

The Nutricia Karicare Gold Plus Toddler advertisement (Figure 4.1) appeared on page 79 of the April/May 2007 issue of Australian Parents. In the top right hand corner the word ‘advertorial’ is printed in a small font. Across the top of the page the headline ‘How to support your toddler’s immunity’ appears in large gold print in two lines. Underneath, a secondary headline reads, ‘Prebiotics, found naturally in breast milk, help children build immunity against infection and allergy. Mums can now ensure toddlers benefit from Prebiotics when they use Karicare Toddler Gold PLUS’. The words ‘Gold PLUS’ are presented as brand marks. The copy text is divided into two columns, the left 1/3 of a page wide and the right 2/3. Two text boxes are contained in the left hand column. One is headed, ‘Breast milk is the best’ and cites the World Health Organization breastfeeding recommendation. The other is headed, ‘Karicare Toddler GOLD PLUS contains’ and includes a series of bullet points (ticks) that list some of the ingredients and their benefits. The words ‘Karicare Toddler Gold PLUS...
with exclusive Nutricia Prebiotics supports your toddler’s natural immune system’ appear in gold subtitle font under the copy text. The right column is dominated by a photograph of a smiling (or even laughing) baby who appears to be naked. The baby is held close to the woman’s chest, facing out over her shoulder. Their cheeks are touching and although only part of the woman’s face is visible, because the photograph is taken from behind her, it is clear that she is smiling broadly. The sun appears to be shining from behind the baby. Both the woman and child are blonde. The top left diagonal half of the column is filled with text that contains two gold subtitles, ‘The natural power of prebiotics’ and ‘Naturally support your child’s immunity’. Underneath the text a navy blue, gold and white shield shaped logo bears the words, ‘NUTRICIA PREBIOTICS supports your toddler’s natural immune system’. In the bottom right hand corner is a pack shot. Under the pack shot are the words ‘NUTRICIA Caring for babies since 1896’.

The Heinz Nurture Gold Toddler advertisement (Figure 4.2) which appeared in the June 2006 issue of Sydney’s Child magazine features a large (3/4 page) photograph of a toy dump truck spilling a load of sardines. Underneath the photograph, the headline reads, ‘Giving your toddler enough nutrients can be a challenge’ and is followed by six lines of copy text. Underneath the copy text a blue and gold circular logo bearing the words ‘NDP-3g’ and ‘FOR ACTIVE CHILDREN’ appears next to the words ‘Nourishment. Protection. Development’ A pack shot the same height as the column of text appears in the bottom left hand corner.
Please see print copy for images
The Wyeth S26 Gold Toddler advertisement (Figure 4.3) which appeared on page 40 of the August/September 2007 issue of Australian Parents magazine features a large (1/2 page) photograph of three children (two girls and a boy) who are touching their heads with both hands. The boy has red curly hair and a rosy complexion, one girl has dark brown tightly curly hair and dark skin and the other girl has fair skin and blond hair tied in pigtails. There are children’s artworks hanging on painting easels and a child’s chair in the background. The text is divided into two columns. Underneath the photograph, the headline, ‘good for their heads, shoulders, knees and toes’ appears in the right hand column. Nine lines of copy text occupy the left hand column, underneath which a navy blue and white ovular logo bears the words ‘WYETH BIOFACTORS SYSTEM’. In the bottom right hand corner a pack shot appears next to the words, ‘feed their potential’. Across the bottom of the page a narrow navy blue strip bears the words ‘Wyeth’ on the extreme left and ‘always advancing’ in the right justified position.
Figure 4.3 – Wyeth S26 Gold Toddler advertisement

Please see print copy for images
2.2 Instrument development

Following an initial examination of the advertisements, a 6-item self-report questionnaire was developed that addressed the readers’ understandings of, and responses to, the claims made in the selected advertisements (Figure 4.4).

Figure 4.4 – Pilot Interview Questions

<table>
<thead>
<tr>
<th>Interview Questions</th>
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<tbody>
<tr>
<td>1. What product is being advertised?</td>
</tr>
<tr>
<td>2. What is the main message of the advertisement?</td>
</tr>
<tr>
<td>3. What does this advertisement tell you about this product?</td>
</tr>
<tr>
<td>4. How do you feel about this product? Is this a good product?</td>
</tr>
<tr>
<td>5. Who is this product aimed at? Who would find this product useful?</td>
</tr>
<tr>
<td>6. Is the information in this advertisement true?</td>
</tr>
</tbody>
</table>

The questions were pilot tested with two women, both expecting a first child, who were recruited from the main campus of the University of Wollongong. Examination of the pilot data revealed that the written responses provided the same data as were elicited from the verbal responses; as a result directed discussion was selected as the methodology for this study. Key questions derived from eight themes that were identified from examination of the pilot transcripts were used to guide the interviews (Figure 4.5).
2.3 Recruitment

Women attending seven antenatal education classes conducted on the NSW Central Coast between the 1\textsuperscript{st} of June and the 31\textsuperscript{st} of December 2007 were invited to participate in the study. Women older than 18 who had not previously given birth to a live child were eligible to participate. Recruitment was guided by data analysis and continued until saturation had been reached. In total 15 mothers participated in the study. Participants were offered a $20 gift voucher from a local retailer as compensation for their time.

All interviews were conducted on the understanding that they would remain confidential, that no identifying details would be recorded on the transcripts and that respondents would be offered the opportunity to check their transcripts, for accuracy.
Approval for the study was granted by the University of Wollongong and the Northern Sydney Central Coast Area Health Service Human Research Ethics Committees.

2.4 Data Collection
Interviews were conducted and recorded on premises of the Northern Sydney Central Coast Area Health Service between June 2007 and January 2008. Following completion of a formal consent procedure and time spent building rapport, each respondent was shown one randomly selected advertisement. In order to mimic reading conditions typically experienced by consumers reading magazines, participants were asked to identify the product being advertised within moments of being handed the stimulus advertisement. Themes outlined in the interview guide were explored; each participant was then asked to read aloud the entire text of the advertisement and report her thoughts as she read. This Think Aloud Technique, a form of Cognitive Interviewing, has its foundations in Cognitive Psychology and Information Processing Theory. It affords researchers insight into the thought processes of participants, revealing key words and phrases that arise from their own perceptions and has been used to assess learning, to inform survey design and health messaging (Carbone, Campbell et al. 2002; Carr 2002; Greenwald 1968).

Conversations between the interviewer and respondents were allowed to range freely so as to explore, as comprehensively as possible, respondents’ understandings of the advertisements. Open questioning, reflective questioning, clarification, repetition of ideas that appeared from the participants’ tone or body language to be significant to them, and summarising of participants’ responses were used to facilitate a thorough exploration of their readings of the advertisements. Indirect (i.e., structured projective) questioning (Donoghue 2000; Fisher 1993; Liamputtong and Ezzy 2005)
was also used to avoid eliciting socially desirable or stereotypical responses. For example, participants were asked whether the mothers they knew would believe the claims made in the advertisements since admitting that one accepts advertising messages uncritically might be a source of challenge to participant’s self-concept.

In order to minimise any influence the interviewer might have exerted on the responses given, recordings and transcripts of the interviews were examined by the project supervisor to ensure that the interviews facilitated frank discussion. Detailed field notes were also kept to enable the interviewer to reflect upon her role in the interview process, and to ensure that she had retained the role of neutral observer for the duration of each interview (Liamputtong and Ezzy 2005).

2.5 Data Analysis
Data collection and analysis were conducted simultaneously in order to facilitate determination that saturation had been reached for each advertisement. Transcription of the recordings of interviews was performed by the interviewer within 48 hours of the interview in order to facilitate detailed analysis through immersion in the data. A thematic approach, known as ‘framework analysis’, was used to derive patterns from the participants’ responses (Krueger 1994; Ritchie and Spencer 1994). Framework analysis allows themes to develop both from the research questions and the responses. The interview guide was used to inform the coding process. Transcripts were coded by hand (Glaser 1992; Liamputtong and Ezzy 2005).

2.6 Validity
A number of steps were taken to validate the analysis (Liamputtong and Ezzy 2005). The coding scheme was developed collaboratively, drawing on the student’s significant experience working with new mothers and the primary supervisor’s significant expertise in the area of marketing research. Responses that were
inconsistent with emerging patterns were sought and reported where they occurred. Expert validation of the coding scheme and its application was provided by a third researcher with expertise in qualitative research on infant feeding and who was not otherwise involved in the project. Analysis of the structure and composition of the advertisements themselves with specific reference to marketing theory (Rossiter and Bellman 2005) was used as a source of triangulation. As each of the three advertisements referred consumers to commercial websites, these were used as a further source of verification. Verbatim quotations, reported using pseudonyms, are used to illustrate patterns in the participants’ responses and, as is the custom with qualitative research, the results are presented simultaneously with observations from the literature (Liamputtong and Ezzy 2005).

3 RESULTS AND OBSERVATIONS

3.1 Demographic characteristics
The demographic features of the women who participated in this study are reported in Table 4.1.

All but one of the respondents planned to breastfeed their babies. Two mothers planned to combine breastfeeding and bottle feeding from birth. Given that almost 87% of mothers who responded to the 2001 National Health Survey (Australian Bureau of Statistics 2003) initiated breastfeeding, 90% of NSW mothers initiated breastfeeding in 2001 and 87% of NSW mothers initiated breastfeeding in 2003-4 (Garden, Hector et al. 2007), the intentions of these women are consistent with those of other Australian mothers.

Table 4.1- Demographic characteristics of interview respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

75
3.2 Identifying toddler milk as ‘formula’

On their initial readings, only three respondents were able to correctly identify that the product being advertised was suitable for ‘toddlers’. The remaining mothers initially described or recognised the product as ‘formula’, ‘infant formula’, ‘baby formula’ or ‘babies’ milk’. These responses are reported in table 4.2. Jodie’s response, ‘baby formula for bottles’, was particularly specific, describing both the product and her understanding of its intended mode of delivery. These responses are consistent with the results of British research which found around 60% of mothers and expectant mothers thought follow-on formula advertising was promoting infant formula (National Childbirth Trust/ Unicef UK 2005; NOP World for Department of Health 2005).

Table 4.2 - Product Identification

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Ad</th>
</tr>
</thead>
</table>

1Percentages do not sum to 100 due to rounding; 2One respondent did not answer this question.
Jane  I’d look past it [this advertisement] because it’s for formula or it appears to be for formula
Judy  it is obviously a formula
Julitha  It looks like it’s a formula
Jennifer  Well, babies’ milk
Jacqueline  There’s the baby formula
Janet  um formula
Joanne  Yeah, I’d say it’s formula
Jemima  ‘Toddler Gold Plus’ I am assuming is the formula.
Jessica  It’s um powdered milk; [reads] “toddler nutritional supplement*”
Jaime  um so if I look at the picture the S26 which I believe is a formula feeding only because of the experience of it in woollies and with my pregnancy that um unless I look at it [brings the advertisement very close to her face] step 3. That’s probably a bit along, with the kids so being toddler, it could be, I don’t know what the age of toddlers are but two year olds or something like that …
Jodie  Um it’s baby formula for bottles
June  Um it’s baby formula
Julie  Formula
Jacinta  It’s like a, like that milk, that toddler’s milk.

*Responses indicating that the product is toddler milk or toddler formula are italicised

It was only after the participants had been asked to read all the text contained in the advertisement that they revised their identification of the products to indicate that they were suitable for toddlers. However, all but one of the mothers commented that they would ordinarily not have read far enough into the advertisement to have determined that the advertisements were not promoting infant formula.

Furthermore, they all expressed the view that ‘formula’ products were properly used as an alternative to breastfeeding. These responses fell into two groups, those who thought that the product would be used by mothers who could not breastfeed or had chosen not to breastfeed and those who thought that it should be used after breastfeeding has ceased (their responses are italicised)(see table 4.3). Even Jacqueline who was familiar with these products because she planned to formula feed her baby and so understood that Heinz Nurture Gold Toddler was suitable for children over a
year old, seemed to suggest that it would be used primarily by mothers who did not breastfeed their babies. Examination of the mothers’ expected durations of breastfeeding suggests that even those who thought that toddler milks were intended for use after breastfeeding understood it to be a replacement for breastmilk in the diet of an infant (see table 4.4).

Table 4.3 -- Role of product:

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Ad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joanne</td>
<td>People that aren’t breastfeeding&quot;</td>
<td>Karicare</td>
</tr>
<tr>
<td>Janet</td>
<td>I guess someone who’s still deciding between breastfeeding and formula</td>
<td>Karicare</td>
</tr>
<tr>
<td>Jessica</td>
<td><em>When you can’t or you stop breastfeeding</em></td>
<td>Karicare</td>
</tr>
<tr>
<td>Jemima</td>
<td>Yeah or if they [doctors] said, ok, well now it’s time to start bottle feeding</td>
<td>Karicare</td>
</tr>
<tr>
<td>Judy</td>
<td>If the baby wasn’t getting enough nutrients and I wasn’t producing enough milk or it’s [breastfeeding] going to harm the baby or I was on any medications or things like those sort of issues that you perhaps came into play then I’d have to reassess. If it’s a health concern for the mother or the child then that’s when formula would probably come into play</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jacqueline</td>
<td>I’ll probably use something like it. TELL ME ABOUT THAT. Well I’m not going to breastfeed so I’m going to be [using] formula anyway.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jennifer</td>
<td>If you’re not breastfeeding, you’re bottle feeding</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jane</td>
<td>I suppose if you couldn’t breastfeed it would be an option</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jaime</td>
<td>It depends on what my child's like. Like my child might take well to breastfeeding and it might not have any allergies and its development is fine. I guess if it was to the point where I required supplements or extra nutrients um $26 is probably something you would look at.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Julie</td>
<td>Mothers, also that aren’t breastfeeding.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jacinta</td>
<td><em>I want to breastfeed then apparently, when your kid’s a certain age they’re meant to go on to something different like um like some women that don’t breastfeed, they go on the newborn stuff and then when it gets to a certain age you have to change [to a follow-on formula].</em></td>
<td>Wyeth</td>
</tr>
</tbody>
</table>

*responses indicating the product should be used after breastfeeding has ceased are italicised

#responses indicating the product should be used instead of breastfeeding are not italicised

78
Identifying the product as ‘formula’ or ‘baby formula’ did not preclude a simultaneous understanding that the advertisement presented a version of infant formula suitable for older children. Similarly identifying the products as suitable for toddlers did not preclude the belief that it was ‘formula’. When June was asked, ‘What is the product?’ she replied ‘Um it’s baby formula’. The next question posed to her was, ‘Tell me about who you think the advertisement might be aimed at’; she replied ‘Mothers or parents with very young toddlers’. Even though Jemima read the name of the product correctly as ‘Toddler Gold Plus’, she simultaneously identified the product as ‘formula’ saying, ‘Toddler Gold Plus’ I am assuming is the formula’.

These results suggest that the respondents recognised ‘formula’ or ‘baby formula’ as a category rather than an individual product, and that this category includes but is not limited to infant formula. Jodie’s surprise upon realising that the advertised ‘formula’ was not intended for babies provided a clear indication that this new information extended her definition of ‘formula’. She said, ‘Ooh so it’s more for older kids. I didn't know that this would even, came for older kids. I thought it was just for babies.’ Jaime’s identification of Wyeth S26 Gold Toddler as ‘a formula feeding suitable for toddlers’ appears to be contradictory unless she thinks of ‘formula’ as a group, rather than a single product.
Examination of other marketing materials and advertising literature suggests that this might be the way these advertisements were intended to be understood. For example, at the bottom of the Karicare Gold Plus Toddler Milk web page there are links to ‘Other Karicare Gold Plus Formulas’, including infant formula and follow-on formula. The page on Wyeth Nutrition’s website entitled Step 3 – S26 Gold begins with the statement, ‘S26 Gold Toddler is the third step in the Wyeth Nutrition Gold 1-2-3 Range’. The Heinz Nurturebaby website exhorts parents to ‘Choose the right formula for your baby’s age’ while depicting infant formula, follow-on formula and toddler milk packages (H.J. Heinz Company (Australia) Limited 2007; Nutricia Limited 2006; Wyeth 2008).

3.3 Line extension: advertising one product to promote others
Participants’ readiness to identify toddler milks as ‘formula’ is particularly interesting because the word ‘formula’ does not appear in any of the advertisements used for this study. The salience of the brand identities on these product packages might help to explain why so many mothers recognised them as ‘formula’. Eight respondents stated that it was the pack shot that identified the product as formula (Table 4.5).
Identifiers such as packaging, colour or logos are often used as category labels by advertisers as part of a process known as ‘line extension’. Category labels encourage consumers to transfer what they know about a familiar brand or group of products (known as a line) to a new product (Kotler and Armstrong 2001; Moreau, Markman et al. 2001; Whan Park, Milberg et al. 1991; Yamauchi and Markman 2000). For example, Coca Cola used line extension to encourage consumers to use their knowledge of Coca Cola to inform their expectations of Diet Coke.

Advertising only one product in a line can then effectively promote all the others by eliciting positive associations for a brand, which consumers then apply to all of the products bearing that brand (Whan Park, Milberg et al. 1991). This is important as research indicates that people exposed to advertising are more likely to purchase the
brands they have recently seen advertised even when they do not recall seeing the advertisement (Kardes 2002; Schachter 1997).

Line extensions also operate in reverse, enabling advertisers to advertise only ‘a small percentage of products in the total line, knowing that a large number of other items will also benefit from that advertising’ (Morein 1975). This is achieved by increasing the prominence of the logo and product name on the entire range of products. Brand features such as logos, graphics, package type, shape and product names are much more salient in toddler milk advertisements than the text that clarifies the appropriate age at which these milks should be offered. This observation lends support to the notion that toddler milk advertising may well be purposely designed to promote advertisers’ entire line of formula products, including infant and follow-on formula.

It is notable that many of the same trademarks (Wyeth’s ‘Biofactors System’, Heinz’ ‘NPD’ and Karicare’s ‘GOLD PLUS Nutricia Prebiotics’) highlighted in advertising for toddler milks are also highlighted on the packaging of infant formula. The prominence of these trademarks appears to be designed to link toddler milk advertising with infant and follow-on formula, and to encourage consumers to transfer what they learn about these ingredients from toddler formula advertisements to infant and follow-on formula.

This sort of advertising strategy has been used to minimise the effects of regulation in other product categories. Following the introduction of comprehensive bans on the promotion of tobacco products in Singapore, Philip Morris began advertising an alcoholic beverage bearing the 'Alpine' brand as a precursor to its launch of Alpine cigarettes. Advertising for the beverage product was used to engender positive brand associations in the minds of the target group without contravening local laws prohibiting tobacco advertising (Assunta and Chapman 2004b).
3.4 Positioning formula: ‘pretty close’ to breastmilk

Some of the responses indicated an understanding that the advertisements were comparing the formula brand with breastmilk. Analysis of the advertisements and examination of the marketing literature were used as a source of triangulation. According to marketing literature, one of the most significant roles of advertising is to position the brand with regard to competing brands (Kotler and Armstrong 2001; Ries and Trout 2001). It is reasonable to regard breastfeeding as the most important competitor for infant formula in Australia since almost all Australian mothers choose to initiate breastfeeding.

Examination of the advertisements themselves also suggests that they are designed to position formula brands relative to breastfeeding. Two of the advertisements used a strategy described as ‘probabilogic’ to compare their products favourably with breastfeeding (Rossiter and Bellman 2005). This strategy uses an incomplete syllogistic pattern, in which two true statements guide the reader to infer, illogically, a third. The text of the Karicare GOLD PLUS advertisement (Figure 4.1) begins with the following statement, ‘Prebiotics, found naturally in breastmilk, help children to build immunity against infection and allergy’ and then claims that ‘Mums can now ensure that toddlers benefit from Prebiotics when they use Karicare Toddler GOLD PLUS’. In this case the first claim is that prebiotics (many thousands of which occur naturally in breastmilk (Bye 2004; Newburg 2000)) protect children. The second claim is that (an unspecified blend of) prebiotics are included in Karicare formula. And although it does not necessarily follow (Coppa, Zampinia et al. 2006), the reader is left to infer that Karicare formula protects children just like breastmilk does. The alignment of this brand with breastfeeding is reinforced by the use of two text boxes in the left hand column. The first says, ‘The WHO recommends that infants be
exclusively breastfed until around six months of age and continue breastfeeding until at least 2 years. Breast milk has ... the correct balance of nutrients ... such as enzymes, antibodies and immune stimulators' and the second says, ‘Karicare Toddler GOLD PLUS contains omega 3 DHA, Iron [and] GOLD PLUS Nutricia Prebiotics which provide your toddler with better digestion, softer more regular stools and supported natural immune system’. The juxtaposition of these two boxes leaves the reader to form the impression that this brand meets with the approval of the WHO. Janet made this quite explicit when she said, ‘it’s trying to convince you that it’s just as good as breastmilk... by bringing in the World Health Organization’s, ‘breast is best’ and saying that it’s giving the same kind of advantages’. Heinz (Figure 4.2) also uses this strategy, invoking the words of a paediatrician who ‘recommends that toddlers get enough Omega 3 DHA for brain and eye development’. While the doctor does not actually recommend the product or the brand, the juxtaposition of her statement with the claim that Heinz Nurture Gold contains ‘more Omega 3 DHA than any other toddler milk’, leads the reader to infer an endorsement. Jennifer observed, ‘it says a doctor recommends it’.

Although Wyeth uses a different strategy, its advertisement (Figure 4.3) also compares its formula range with breastfeeding. The advertisement claims that ‘the advanced Wyeth Biofactors System, provides an age appropriate combination of nutrients to help support their cognitive, visual and physical development’. This statement is remarkably similar to public health messages that are designed to promote breastfeeding such as those found in NSW Health’s Breastfeeding Your Baby booklet (NSW Department of Health 2006) which states that ‘Breastfeeding provides all your baby’s essential needs for growth, development and protection ...’; the South Australian Health website (SA Department of Health 2009) which states that ‘Breast
milk is a complete food for your baby’s growth and development. Breast milk contains long chain fatty acids that help your baby’s brain develop’; and the Australian Breastfeeding Association’s website (Australian Breastfeeding Association 2005) which states that ‘Breastfeeding aids the development of your baby’s eyesight, speech and intelligence’. These messages are echoed in the reasons Australian mothers give for choosing breastfeeding for their babies (Brodribb, Fallon et al. 2007). After reading this advertisement Jaime commented, ‘it has all the nutrients that it’s supposed breastmilk has’. Thus this advertisement seems to lead readers to infer that the Wyeth S26 Gold brand offers many, if not all of the important functions of breastmilk/breastfeeding.

3.5 Targeting mothers who choose to breastfeed
All but one of the respondents planned to breastfeed their babies but only one planned to breastfeed for more than 12 months. Furthermore, they all indicated that they believed that breastfeeding success was uncommon (Table 4.6). Some, like Jemima who told the story of her aunt’s failure to produce sufficient milk for her baby, even seemed to expect to fail. There is some evidence that these advertisements are targeted at mothers who have chosen to breastfeed but expect to fail.
**Table 4.6 – Breastfeeding goals and confidence**

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Ad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jemima</td>
<td>Oh well just depending on how things go because um I was told one of my aunts could only breastfeed for six weeks. She just didn’t produce the milk to breastfeed for longer so just if things like that happen.</td>
<td>Karicare</td>
</tr>
<tr>
<td>Jessica</td>
<td>Well I’d like to. I’m really going to try and breastfeed</td>
<td>Karicare</td>
</tr>
<tr>
<td>Janet</td>
<td>I’d like to try for six to twelve months.</td>
<td>Karicare</td>
</tr>
<tr>
<td>Joanne</td>
<td>If it goes well, I’ll do what they say to do, you know start introducing solids at six months but you know no more than probably eight months I don’t think, if everything’s going well. If I hate it, one month. I will try, though.</td>
<td>Karicare</td>
</tr>
<tr>
<td>Jodie</td>
<td>for as long as I have milk or up until, I don’t know. 18 months? <strong>Is running out of milk something you worry about?</strong> No I’m not worried. I’ll just go onto formula.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jacinta</td>
<td>I hopefully want to breastfeed.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jaime</td>
<td>It might not take to breastfeeding. I want to try both.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Julie</td>
<td>Six months</td>
<td>Wyeth</td>
</tr>
<tr>
<td>June</td>
<td>Breastfeed, and if not, I guess bottle</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jennifer</td>
<td>Yeah, I was going to breastfeed. If possible.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jane</td>
<td>I think it’ll end up being 11 months because I’ve just been told that I have to have my first, the ovarian cancer vaccination before I turn 27</td>
<td>Heinz</td>
</tr>
<tr>
<td>Julitha</td>
<td>Definitely go for breastfeeding and see how I go. I am not going to kick myself though, if it doesn’t work out.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Judy</td>
<td>Um yeah well breastfeeding is my [preference]. Probably. I mean, again, I mean it’s not always easy. You just give it a go, don’t you? … And then other circumstances could prevent me [from reaching my goal of breastfeeding for 12 months] but I’d try and get to twelve months. If not, then at least minimum six.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jenaya</td>
<td>One and a half to two years.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jacqueline</td>
<td>Yeah, I am going to bottle feed.</td>
<td>Heinz</td>
</tr>
</tbody>
</table>

By claiming that their brands can provide babies with the benefits mothers associate with breastfeeding, these advertisements seem to suggest mothers can avoid the problems they associate with formula feeding by choosing their brand. Janet said, ‘it’s trying to convince you that it’s just as good as breastmilk’, and Jessica said, ‘if you couldn't breastfeed, you know ... you would consider using a product that mimics what breastmilk does’.
The use of problem-avoidance and/or problem-solution executions was common to all of the advertisements. These strategies are used when the target audience is loyal to a competing brand (Rossiter and Bellman 2005). The competing ‘brand’ appears to be breastfeeding because, although the participants in this study found slightly different messages in each of the advertisements, the notion that ‘formula’ or its ingredients can confer certain health benefits that mothers usually associate with breastfeeding, such as improved immunity, improved nutritional status, improved cognitive, visual or physical development, improved brain growth was understood by readers of all of the advertisements (Tables 4.7 and 4.8). For example, Jennifer said ‘It's meant to be good for your baby's brain’. As noted earlier, these messages closely echo the reasons Australian mothers give for choosing breastfeeding (Brodribb, Fallon et al. 2007). In this way they minimise the differences between formula feeding and breastfeeding and contradict the significant body of evidence associating formula feeding with important health risks (Chen and Rogan 2004; Horta, Bahl et al. 2007; Ip, Chung et al. 2007; Kramer, Aboud et al. 2008; Kramer and Kakuma 2004; Paricio Talayero, Lizan-Garcia et al. 2006, Kelly et al. 2009). Furthermore claims that ingredients such as prebiotics, probiotics and long chain polyunsaturated fatty acids improve outcomes for formula fed infants do not find significant support in the literature (Osborn and Sinn 2007a, 2007b; Simmer 2001; Simmer, Schulzke et al. 2008; Szajewska 2007). These messages appear to be designed to persuade mothers that formula products can provide their infants with the very same health benefits that led them to choose breastfeeding; that these brands offer an alternative that is able to confer many, if not all, of the important benefits of breastfeeding.
<table>
<thead>
<tr>
<th>Respondent</th>
<th>Comparison to breastmilk</th>
<th>Immunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joanne</td>
<td>That it’s good for the immune system. … telling you that you need to keep giving them something to build up their like their immune systems pretty much. So they don’t get sick.</td>
<td></td>
</tr>
<tr>
<td>Jemima</td>
<td>&quot;Prebiotics are food for the friendly bacteria found in the gut. This bacteria along with other elements in breastmilk are a powerful natural and essential barrier against infection.&quot; So I would assume that they’re saying like formula and breastmilk at the same time [contain prebiotics].</td>
<td></td>
</tr>
<tr>
<td>Jessica</td>
<td>&quot;Breastmilk has developed over millions of years …&quot; Oh, it's saying that it's mimicking um what um. It's saying that breastmilk is the best because it has all these things. It has the right enzymes, antibodies and immune stimulators and that this product is um perhaps trying to mimic those things. Um I suppose breastfeeding is the best but if you couldn't breastfeed, you know … you would consider using a product that mimics what breastmilk does.</td>
<td>Um its just um supporting or when you can't or you stop breastfeeding um to continue to keep your child's immune system up high and to high levels that you would use this particular milk product.</td>
</tr>
<tr>
<td>Janet</td>
<td>Um, I feel like it’s trying to convince you that it’s just as good as breastmilk. <strong>How is it doing that? Do you want to tell me more about that?</strong> Just by bringing the immunity factor into it. And you know bringing the World Health Organization, breast is best and saying that it’s giving the same kind of um advantages.</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.8 – Main Message: Heinz and Wyeth

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Ad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane</td>
<td>Um that this is a way to get all the nutrients to your child without having to worry about them being fussy eaters.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Julitha</td>
<td>If they're not big fish eaters then maybe they could have some of that.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Judy</td>
<td>If your child’s really a fussy eater and um you know, doesn’t want to eat food or whatever then yeah definitely. Because they need to be growing and developing and their brains are so important and if you leave that to sort of lapse too much and not, you know ignore it and go, ‘oh look, it’s only a period of time’, it could be six months and you know that’s a long time to starve a child of the right nutrients … It’s getting all the nutrients and the iron and you know probably all the folate and things like that which the child’s needing so I would say it’s a good healthy supplement.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jacqueline</td>
<td>Um, nutritional value … um, yeah. That it's a good way to get what the child needs from this product.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jennifer</td>
<td>That it’s got omega 3 in it. It’s meant to be good for your baby’s brain</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jodie</td>
<td>when I have my baby, and it's a toddler I can yeah give it formula if um knowing that its going to cover all those things that I just read out.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Julie</td>
<td>That it provides all the nutrients that they need.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jacinta</td>
<td>um that you’re getting all your, like says, help with their con-nitive [cognitive] visual and physical development. So it’s just meant to, I don’t know, help them. Just being young and they want their kid to improve in their, I don’t know, their body and bones and stuff.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jaime</td>
<td>So for me, reading that is basically the whole formula has everything that is required for the child to grow cognitive, physically, mentally um within their development age. … The main message? that if you use S26 it's going to be a great potential for the development of your child in the toddler years. It's going to fulfil all the nutrient requirements for them to grow, get bigger and strong and developmentally, physically, cognitively reading the advertisement it does indicate that it is a good product because you’ve got your children who are happy and it’s you know good development – feeding their potential.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>June</td>
<td>it’s good for them all over.</td>
<td>Wyeth</td>
</tr>
</tbody>
</table>

The problem-solution execution is also evident in elements of these advertisements that suggest that their brands offer mothers an easy solution to common feeding problems. The Heinz advertisement depicts a toy tip-truck dumping a load of sardines. This image, which a number of the participants found unappetising, appears to convey the idea that children are more likely to play with nutritious food than eat it. Jacqueline’s first comment in response to this advertisement was, ‘Yuk! Fish’ and
Judy’s sarcastic tone on declaring, ‘A tip truck full of salmon, mm- mmm!’ conveys a similar message. This image seemed to arouse the mothers’ anxieties about their capacities to ensure their children are properly nourished, and then to offer the Heinz Nurture Gold formula brand as a palatable solution. Jane said, ‘this is one way of making sure that they can cross off the omega 3 make sure their child's getting enough’.

The Karicare advertisement highlights the WHO recommendation that mothers breastfeed their children until they reach at least two years of age. Several of the mothers who saw this advertisement mentioned that they had no intention of conforming to this recommendation, suggesting it was unrealistic. The advertisement then offers to solve the tension between non adherence to health recommendations and the provision of proper nutrition by claiming that the Karicare brand contains ingredients ‘similar in form and function’ to those found in breastmilk. Janet, Jessica and Jemima, who saw this advertisement, thought it was claiming that Karicare Gold Plus was similar or equivalent to breastmilk.

The message of the Wyeth advertisement was read similarly although it is framed more positively. The advertisement claimed that ‘it’s important they get the nutrients they need to help them every step of the way’ and offering S26 is ‘feeding your toddler’s potential from head to toe’. This is particularly important given that 10 of the 14 participants who planned to breastfeed expected to encounter difficulties with breastfeeding; only one participant expressed a breastfeeding goal that was consistent with public health recommendations. Joanne’s response was typical ‘If it goes well, I’ll do what they say to do, you know start introducing solids at six months but, you know, no more than probably eight months’. 


The Wyeth S26 brand offers mothers a way to avoid worrying that their children’s failure to eat ‘properly’ will compromise the development of their ‘potential’. Given that the Wyeth S26 range includes an infant formula, consumers might well infer that the S26 brand also offers a solution to the problems mothers encounter with (breast) feeding an infant according to public health recommendations. Three of the five respondents who saw this advertisement gave responses similar to Jaime’s, ‘It's going to fulfil all the nutrient requirements’.

3.6 Reassurance
The idea that the products they had seen advertised could offer mothers reassurance that their children were being properly fed was persistent. After reading the copy of the advertisement in its entirety, a number of respondents indicated that they thought mothers would feed their children toddler formula in order to reassure themselves that their children were adequately nourished (Table 4.9). Of these, five had earlier indicated that they thought that mothers would use the product they saw advertised in place of breastmilk. *(These mothers’ responses are italicised.)* And of these five, only Jaime thought that she would have read the copy text of advertisement if she had come across it in a magazine.
Table 4.9 - Reassurance

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Ad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane</td>
<td>… people with busy lifestyles that um maybe don't want to worry too much about what their children are eating or don't have time to think about whether they get enough nutrients um and this is one way of making sure that they can cross off the omega three make sure their child's getting enough</td>
<td>Heinz</td>
</tr>
<tr>
<td>Judy</td>
<td>But if they weren't and they were struggling in eating foods and disliking things then you'd have to look at supplementing the dietary requirements so that's probably when I would look at 'ok let's see what else is on the market'.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Julitha</td>
<td>Maybe they don't have enough fish in their diet and they feel that they want to give the child the best start. …Well basically if you don't eat enough fish.</td>
<td>Heinz</td>
</tr>
<tr>
<td>Jacinta</td>
<td>I think children and I think even adults need, some people need supplements like vitamins because to help your body grow and stuff like that because you can't get all. You see ads all the time on TV and plus you know that um like you're meant to have like five serves a day of vegies a day and five serves of fruit but that's impossible unless you're just a freak. And you're meant to take vitamins so you can have all those sorts of things. So probably we all need stuff. Not just kids. Like we all need certain things to help us. Fish and omega 3 and all that other stuff.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jaime</td>
<td>I guess it could also be used as a supplement too if they were, they drink milk but not a lot of milk or they're not getting enough supplements from elsewhere</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Jodie</td>
<td>Well just when I have my baby, and it’s a toddler I can yeah give it formula if um, knowing that it's going to cover all those things that I just read out.</td>
<td>Wyeth</td>
</tr>
<tr>
<td>Janet</td>
<td>Maybe if you had a really fussy eater who wouldn't eat anything.</td>
<td>Karicare</td>
</tr>
</tbody>
</table>

3.7 Believability

In order to ascertain how persuasive these advertisements might be, respondents were asked whether they thought that the claims made in them would be believed by mothers that they knew. All but four of the respondents accepted the claims made by these advertisers, or thought that mothers they knew would do so, quite uncritically (table 4.10). In particular, respondents found the use of scientific or technical sounding words (jargon)especially persuasive and this is a strategy that has been used to convince mothers of the legitimacy of formula for decades (Apple 1986; Gottschang 2000; Palmer 2009), Jacqueline said that ‘All the words I don’t
understand” told her that the Heinz Nurture Gold Toddler would be a healthy choice for her baby and Jemima that, ‘It all sounds really technical and you know good for the baby I would assume.’ This finding is consistent with that of other research in which mothers reported that the use of technical language in infant formula advertising was particularly persuasive (Gottschang 2000; Mitchell 2009; Suleiman 2001). This is of particular concern when such claims are applied to infant formula, because they clearly contradict public health messages about infant feeding and are therefore likely to mislead consumers about the health effects of feeding their babies infant formula in place of human milk.

Of the three mothers who expressed doubts about the claims only June said that she would seek independent verification from a health professional. The other two said that they would consult advertisers’ websites or other mothers in order to assess the advertising claims.
Table 4.10 - Believability

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaime</td>
<td>It is [BELIEVABLE] with the picture.          Wyeth</td>
</tr>
<tr>
<td>Julie</td>
<td>People usually believe what they read when its things like that … I'd believe it if I read it. I believe it. Wyeth</td>
</tr>
<tr>
<td>Jodie</td>
<td>Yeah. I do. They look pretty genuinely happy, healthy. Wyeth</td>
</tr>
<tr>
<td>Jacinta</td>
<td>I think children and I think even adults need, some people need supplements like vitamins because to help your body grow and stuff like that because you can’t get all. Wyeth</td>
</tr>
<tr>
<td>Judy</td>
<td>Yeah I think [they] would be quite interested to know what’s in them now days, if you were sort of considering using the product, you definitely would do your research to see what the different products have in them so that you’d be aware, yeah. Heinz</td>
</tr>
<tr>
<td>Jacqueline</td>
<td>yeah. I don't see why not. I've never heard, like if you hear like bad things about the product then that's the only way that you know that it's not trustworthy, really, isn't it? Heinz</td>
</tr>
<tr>
<td>Jennifer</td>
<td>Um I can't see why they wouldn't. I suppose because it says a doctor recommends it and you hear about omega 3s in general not necessarily to do with toddler milk so I suppose they would, yes Heinz</td>
</tr>
<tr>
<td>Julitha</td>
<td>Very familiar. That's the only reason why I'd believe everything in that advert so I am assuming that they would as well. Heinz</td>
</tr>
<tr>
<td>Jemima</td>
<td>Well I would assume it is just because that sign sort of thing [shield logo] seems authentic. … Yeah. Like I would assume that um someone with a medical background has done some, or a science background has like written it or, or, I hope it was true! Karicare</td>
</tr>
<tr>
<td>Jessica</td>
<td>yeah I think they would look at that and um look positively at that &quot;The Gold, Toddler Gold Plus contains omega 3 DHA, iron …&quot; so I would assume it's a good one because it's got the iron in it. Karicare</td>
</tr>
</tbody>
</table>

4 SUMMARY

Mothers glancing at advertisements for toddler formula, as they would when reading a magazine, overwhelmingly believed that they were seeing advertisements for infant formula. Even after developing an understanding that the product depicted in the advertisements was suitable for children over the age of one, they still thought they were seeing an advertisement for a line of products, collectively known as ‘formula’. These perceptions were consistent with the characterisation of ‘toddler milks’ as part of the advertisers’ ‘formula range’ found on their websites and with the established marketing practice known as line extension. Respondents expressed a consistent
understanding of the advertisements they saw as claiming that these formula brands can confer many of the important qualities of breastfeeding, messages that are consistent with advertising claims made throughout the history of infant formula advertising. Furthermore the respondents accepted these messages quite uncritically.

The study reported in this chapter determined that consumers perceive advertisements for toddler milks to be advertising infant formula. The following chapter compares the frequency with which these advertisements appear in titles from Australia was compared with the frequency with which they occurred in magazines published in countries where restrictions on the advertising of infant feeding product differed from the measures in place in Australia in order to ascertain whether the MAIF Agreement is effectively protecting the Australian community from advertising that undermines breastfeeding promotion by promoting formula feeding products.
Chapter Five

**Study Two: The advertisements you have when you’re not having advertisements**¹

This chapter describes the conduct, analysis and results of the second of four studies that will be synthesised at the level of interpretation in Chapter Nine. This study utilised quantitative content analysis to compare the type and frequency of formula advertisements that appear in parenting magazines published in differing regulatory environments.

1 **INTRODUCTION**

Infant formula manufacturing companies are known to offer robust resistance to the introduction or expansion of prohibitions on the advertising of their products. Examination of accepted marketing theory and the responses of other industries to restrictions placed on the advertising of their products suggests that advertising that focuses on brand rather than product attributes, emphasizing attributes or associations common to all of the products in the product line or brand family, can effectively mitigate the effects of product advertising bans (Assunta and Chapman 2004a; Assunta and Chapman 2004b; Chapman 1986; Loken 2006; Whan Park, Milberg et al. 1991). In this context it is useful to examine the advertising strategies these same

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¹ “Australians have a brand of non-alcoholic drink known as Claytons which was traditionally positioned successfully with the tagline, ‘Claytons … the drink you have when you’re not having a drink’. Claytons has entered the vocabulary … The word ‘Claytons’ remains linguistically generic among Australians to mean the one you are having when you are not having one. Many … ads could be said to have a ‘Clayton’s message’ – that is the message you have when you’re not having a message.” Sutherland, M. and A. K Sylvester (2000). Advertising and the mind of the consumer: what works, what doesn’t and why. Crows Nest, NSW, Allen and Unwin (pp56-57)
companies employ in response to national prohibitions of the advertising of some of their formula products.

2 AIMS

This study utilised content analysis to determine whether prohibition of the advertising of one or more formula milk products (such as the prohibition of infant formula, or the prohibition of infant and follow-on formula) had an effect on the type or frequency with which advertising for formula products or brands appeared in parenting magazines in 2007. It examined whether toddler formula advertisements appeared with the same frequency in parenting magazines published in Australia, where the advertising of infant and follow on formulas are prohibited, as they did in those published in countries where the advertising of infant or follow-on formula is permitted; and whether follow-on formula advertisements appeared with the same frequency in titles published in the UK where the advertising of infant formula is illegal as it did in titles published in countries where the advertising of infant formula is permitted. Popular Australian, English, American and Canadian parenting magazines published in 2007 were examined for occurrences of advertisements that contained trademarks or visual identifiers of brands that also appear on infant formula packaging in those countries, and their frequencies compared with reference to national regulations.

3 MATERIALS AND METHODS

3.1 Data collection

Concurrent 12month samples of the most widely read parenting magazines, (ascertained from Morgan Readership Data), from each of five English-speaking countries (Australia, the United States of America, the United Kingdom, Canada and New Zealand) were collected for analysis. In Australia, Practical Parenting, Mother &
Baby and Parenting were identified as those with highest readerships. Mother & Baby was excluded because it does not accept advertisements for toddler formula or any product that falls within the scope of the International Code of Marketing of Breastmilk Substitutes (Bounty 2007). Australian Parents was the only other general parenting magazine available for purchase in Australia at the time and so it was also included in the sample. In the USA, Parents and Parenting were identified as those with the highest circulations in the category. In the UK, Mother & Baby was the most widely read parenting magazine. Prima Baby and Pregnancy and Practical Parenting had very similar readerships and so both were included. Canada had only one magazine in the category, Today's Parent.

Blocks of advertising for any products or services one sixth of a page or larger were counted and tallied to provide a denominator that would indicate the proportion of each title devoted to advertising and thereby facilitate comparisons between titles that varied considerably in length. Advertisements for formula milk products and brands were identified and the ratio of formula advertisements to total pages of advertising was calculated for each issue. Where a formula advertisement spread across more than one page it was counted as a single occurrence of formula advertising. However, where two distinct advertisements for the same product occurred on facing pages, they were counted as two instances of formula advertising.

3.2 Inclusion criteria
Advertisements that promoted infant or follow-on formula, toddler formula, ‘mothers’ club’, telephone or online information service or proprietary ingredients (such as pre or probiotic strains or patented proteins) and shared a brand identity with infant formula products were included in the definition of formula advertisements. If there
was any confusion about whether or not these products or services were part of a formula range, confirmation was sought from company websites.

Advertisements that shared a brand or company logo with formula milk but clearly indicated they were advertising a line of weaning foods (foods or juices) were excluded because they appeared to target a different audience. Advertisements for fortified milk products (or ‘growing-up milks’) that were represented as suitable for children more than a year old but which did not share a brand identity with infant and/or follow-on formula products were also excluded.

Formula advertisements were coded using four categories (Table 5.1). The categories were not mutually exclusive and each advertisement was coded for all of the formula milk types it depicted. Where a single advertisement promoted more than one type of formula milk that advertisement was only counted as one instance of advertising.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant formula</td>
<td>a product based on milk or other edible food constituents of animal or plant origin which is suitable for use as the sole source of nourishment for infants from birth</td>
</tr>
<tr>
<td>Follow-on Formula</td>
<td>a product based on milk or other edible food constituents of animal or plant origin which is suitable for use as the principal liquid source of nourishment in a progressively diversified diet for infants aged from six months who are not breastfed</td>
</tr>
<tr>
<td>Toddler Milk</td>
<td>a fortified milk based product only suitable for children more than a year old that is packaged in a container that is the same size and shape as a container that contains infant formula and marketed as part of a line of formula products</td>
</tr>
<tr>
<td>Brand Advertising</td>
<td>an advertisement that bears the same brand marker(s) as an advertisement for infant, follow on or toddler formula but does not advertise a milk product. These advertisements included advertisements for telephone helplines, mothers’ clubs, websites and proprietary ingredients.</td>
</tr>
</tbody>
</table>

3.3 Reliability

Two types of reliability bear on the conduct of quantitative content analyses. The first of these is stability (sometimes called intra-coder reliability) which ‘refers to the extent to which the results of content classification are invariant over time. Stability
can be determined when the same content is coded more than once by the same coder’. The second is reproducibility (sometimes referred to as inter-coder reliability) which ‘refers to the extent to which content classification produces the same results when the same text is coded by more than one coder’ (Weber 1990, p17).

In order to assess the stability of the coding frame, a randomly selected 25% sample of the issues from each title was recoded two months after the initial data collection. Stability was determined by calculating the number of matches between first counts and second counts and dividing this by the total number of matches plus non-matches to give a measurement which was then expressed as ‘percent agreement’. Data collection achieved average stability of 98.9% for counts of all advertisements and 100% for identification of formula advertisements. As the use of percent agreement as a measure of stability fails to account for code matches expected to be achieved by chance (Krippendorff 2009), the mean frequency of advertisements per issue were compared using the paired sample t-test to ascertain whether there was a statistically significant difference between the counts. No significant difference between the counts was detected ($t_{22}=1.60, p=0.123$).

Reproducibility was assessed by having a second researcher, unrelated to the project, who coded a randomly selected 25% sample of the issues from each title. Inter-coder reliability was calculated and inconsistent tallies dealt with as described above. Average reproducibility of 98.5% was achieved for counts of all advertisements per issue and 100% for formula advertisements. The paired sample t-test was used again to ascertain whether there was a statistically significant difference between the counts. No significant difference between the counts was detected ($t_{19}=2.06, p=0.053$).
3.4 Data analysis

In order to facilitate comparisons between titles that varied significantly in length (total pages per issue) and frequency of publication, the rate of formula advertising (either brand or product advertisements) per page of advertising was calculated for each issue. Similarly, the rates of toddler milk advertisements and follow-on formula advertisements per formula advertisement were also calculated. For ease of reporting these ratios were reduced to decimal fractions and multiplied by 1000. For example, *Mother & Baby* contained 1059 pages of advertising, 76 of which were formula advertisements (numerator). The ratio of 76:1059 was reduced to 0.07177 which multiplied by 1000 to give 71.77. Kruskal-Wallis and post hoc Mann-Whitney U tests were used to test the null hypotheses that prohibition of infant and/or follow-on formula advertising had no effect on the proportion of formula advertisements that promoted toddler milks or on the proportion of formula advertisements that promoted follow-on milks. The Mann-Whitney U test was used to test the null hypothesis that prohibition of infant formula advertising had no effect on the proportion of formula advertisements that promoted follow-on formulas. One-way Analysis of Variance (ANOVA) was used to test the null hypothesis that there was no difference between the mean ratios of formula advertisements per page of advertising amongst the three groups (no regulation; infant formula advertising legally prohibited; voluntary prohibition of infant formula & follow-on formula advertisements). Post hoc analysis was conducted using Tukey’s Honestly Significant Difference test. Data analysis was conducted using Statistical Package for the Social Sciences (SPSS) Version 15.
4 RESULTS

Advertising comprised between 45% and 60% of the magazines’ content. Formula milk advertisements were generally large and prominent. Most instances (91.8%) of formula milk advertising were full page advertisements. Advertisements that occupied 1/3 of a page were common only in American magazines; they occurred only occasionally in Australian titles and never in the British titles. Advertisements that were spread across two pages occurred infrequently and only in American and British titles.

Table 5.2 illustrates the frequency with which the five types of formula brand advertisements (infant formula; follow-on formula; toddler formula; growing-up-milk; and formula branding) occurred in each title across the year. In all, 258 advertisements for any type of formula milk (infant formula, follow-on formula or toddler milk) were observed.

Table 5.2 - frequency of formula advertisements by type

<table>
<thead>
<tr>
<th>Country</th>
<th>Title</th>
<th>Infant</th>
<th>Follow-on</th>
<th>Toddler milk</th>
<th>GUM</th>
<th>Brand</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>Prima Baby &amp; Pregnancy</td>
<td>0</td>
<td>47</td>
<td>0</td>
<td>14</td>
<td>29</td>
<td>75(^1)</td>
</tr>
<tr>
<td></td>
<td>Practical Parenting UK</td>
<td>0</td>
<td>41</td>
<td>0</td>
<td>13</td>
<td>4</td>
<td>45(^1)</td>
</tr>
<tr>
<td></td>
<td>Mother &amp; Baby UK</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>13</td>
<td>30</td>
<td>76(^1)</td>
</tr>
<tr>
<td>Can</td>
<td>Today’s Parent</td>
<td>30</td>
<td>24</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>35(^1)</td>
</tr>
<tr>
<td>USA</td>
<td>Parents</td>
<td>22</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Parenting</td>
<td>35</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>Aus</td>
<td>Australian Practical Parenting</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>0</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Australian Parents</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>87</td>
<td>166</td>
<td>34</td>
<td>40</td>
<td>69</td>
<td>334</td>
</tr>
</tbody>
</table>
Eighty one direct advertisements for infant formula were observed. As expected, all of these occurred in titles that were published in the USA and Canada (no regulation) and there were no occurrences of advertisements depicting or referring directly to infant formula in the Australian or British titles where either a voluntary code or legislation prohibits infant formula advertising.

One hundred and fifty six follow-on formula advertisements were observed. Of these 122 occurred in British titles (infant formula advertisements legally prohibited) and 34 occurred in titles published in the USA or Canada (no restriction). There were no follow-on formula advertisements in Australian titles (voluntary code prohibiting infant formula and follow-on formula advertisements). A greater proportion of all formula advertisements that appeared in titles from the infant formula advertisements legally prohibited group (UK) advertisements were follow-on formula advertisements than those in titles from the no restriction group (USA/CAN). A Mann-Whitney U test was conducted and this difference was found to be significant, \[ U=314.50, \]
\[ p=0.002. \]

Thirty four advertisements that promoted toddler milks were observed. Three advertisements for toddler milk were found in the Canadian title (no restriction) and 31 were found in Australian titles (voluntary code prohibiting infant and follow-on formula advertisements). There were no advertisements for toddler milks in British or American titles.

In order to ascertain whether a larger proportion of formula advertisements in Australian titles (voluntary code prohibiting infant formula and follow-on formula advertisements) were toddler milk advertisements than in titles from countries where

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1Infant formula, Follow-on formula, toddler formula and/or GUM are frequently presented in a single ad. Totals are therefore less than the sum of the other categories. Ads spanning 2 pages were counted as 1 occurrence of advertising.
the advertising of infant and/or follow on formula was permitted, Kruskal-Wallis tests were conducted with REGULATION as the independent variable and Toddler Milk advertisements per formula advertisement and Toddler Milk advertisements per page of advertising as the dependent variables. The Kruskal-Wallis test was used because the distributions of the dependent variables were not normally distributed.

A statistically significant difference was found in the mean ratios of Toddler Milk advertisements per Page of Formula Advertising between the three groups (no regulation, infant formula advertisements legally prohibited and voluntary prohibition of infant and follow-on formula advertisements), $\chi^2, (DF = 2, n=85) = 63.879, p = 0.000$. Post-hoc comparisons were conducted using Mann-Whitney U tests with a Bonferroni adjustment to the threshold for significance such that $\alpha = 0.017$. A significantly higher proportion of formula advertisements in Australian titles (voluntary prohibition of infant and follow-on formula advertisements) were toddler milk advertisements than those from either the no regulation group ($U=0.00, p=0.000$) or IF advertisements legally prohibited group ($U=11.0, p=0.000$).

A statistically significant difference was found in the mean ratios of Toddler Milk advertisements per Page of Advertising between the three groups (no regulation, infant formula advertisements legally prohibited and voluntary prohibition of infant and follow-on formula advertisements), $\chi^2, (DF = 2, n=85) = 63.525, p = 0.000$. Post-hoc comparisons were conducted using Mann-Whitney U tests with a Bonferroni adjustment to the threshold for significance such that $\alpha = 0.017$. A significantly higher proportion of advertisements in Australian titles (voluntary prohibition of infant and follow-on formula advertisements) were toddler milk advertisements than those from either the no regulation group ($U=19.00, p=0.000$) or infant formula advertisements legally prohibited group ($U=19.50, p=0.000$).
Advertisements promoting ingredients or services associated with infant formula brands (formula brand advertisements) only occurred in titles published in the UK (infant formula advertisements legally prohibited) and Australia (voluntary prohibition of infant and follow-on formula advertisements). Advertisements that promoted marketing strategies such as a telephone/email helpline, a website, or a ‘mum’s club’ that shared a brand identity with a line of formula products only occurred in British magazines and advertisements for proprietary ingredients (Nestle bifidusBL) occurred only in Australian titles. These appear in Table 2 under the column labeled ‘brand’.

In order to ascertain whether formula advertisements (including formula brand advertisements) occurred with the same frequency in each of the three REGULATION groups (no regulation, infant formula advertisements legally prohibited and voluntary prohibition of infant formula and follow-on formula advertisements), ANOVA was conducted using REGULATION as the independent variable and Formula Advertising per Page of Advertising as the dependent variable. The distribution of the data did not depart significantly from normality. Levene’s test of heteroscedasticity was not significant, $F(2,86)=2.0574$, $p=0.082$ and so the assumption of homogeneity of variances was judged not to have been violated.

The means and standard deviations are presented in Table 3. ANOVA revealed a statistically significant difference between the group means ($F(2,86) = 17.89$, $p=0.000$) and the null hypothesis was rejected. Post hoc comparisons using Tukey’s Honestly Significant Difference test with a Bonferroni adjustment such that $\alpha = 0.17$ showed that titles from the infant formula advertisements legislatively prohibited group (UK) had a mean ratio of formula advertisements to all advertisements ($M=55.43, SD 24.53$) higher than those the no restriction group (USA and Canada) ($M=24.82$,
and the voluntary prohibition of infant and follow-on formula advertisements (AUS) \((M=37.29, SD = 26.06, \ p=0.014)\). There was no significant difference between the mean ratios of formula advertisements to all advertisements in the voluntary prohibition of infant and follow-on formula advertisements group (AUS) and the no restriction (USA/CAN) group.

In order to ascertain whether formula milk advertisements (not including formula brand advertisements) occurred with the same frequency in each of the three REGULATION groups (no regulation, infant formula advertisements legally prohibited and voluntary prohibition of infant formula and follow-on formula advertisements), ANOVA was conducted using REGULATION as the independent variable and Formula Advertising per Page of Advertising as the dependent variable. The distribution of the data did not deviate significantly from normality. Levene’s test of heteroscedasticity was not significant, \(F(2,86)=2.340, \ p=0.102\) and so the assumption of homogeneity of variances was judged not to have been violated.

The means and standard deviations are also presented in Table 5.3. ANOVA revealed a statistically significant difference between the group means \((F(2,86) = 4.602, \ p=0.013)\) and the null hypothesis was rejected. Post hoc comparisons using Tukey Honestly Significant Difference test with a Bonferroni correction, such that \(\alpha = 0.17\) showed that titles from the infant formula advertisements legally prohibited group (UK) had a mean ratio of formula advertisements to all advertisements \((M=36.91, SD \ 19.08)\) higher than those the no restriction group (USA and Canada) \((M=24.06, \ SD=15.02, \ p=0.010)\). There was no significant difference between the mean ratios of formula advertisements to all advertisements in the voluntary prohibition of infant and follow-on formula advertisements group (AUS) and either the no restriction
(USA/CAN) group or the infant formula advertisements legally prohibited (UK) group.
<table>
<thead>
<tr>
<th>Regulatory Environment</th>
<th>Country</th>
<th>Titles</th>
<th>Mean Ratio All Formula Ads : Pages of Ads</th>
<th>SD</th>
<th>Mean Ratio Formula Milk Ads : Pages of Ads</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Regulation</td>
<td>CAN</td>
<td>Today’s Parent</td>
<td>24.82</td>
<td>15.05</td>
<td>24.06</td>
<td>15.02</td>
</tr>
<tr>
<td>USA</td>
<td>USA</td>
<td>Parenting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal prohibition of infant formula advertising</td>
<td>UK</td>
<td>Prima Baby &amp; Pregnancy</td>
<td>55.43</td>
<td>24.53</td>
<td>36.91</td>
<td>19.07</td>
</tr>
<tr>
<td></td>
<td>UK</td>
<td>Mother &amp; Baby</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UK</td>
<td>Practical Parenting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voluntary prohibition of infant and follow-on formula advertising</td>
<td>AUS</td>
<td>Australian Practical Parenting</td>
<td>37.29</td>
<td>26.06</td>
<td>33.19</td>
<td>21.54</td>
</tr>
<tr>
<td></td>
<td>AUS</td>
<td>Australian Parents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to ascertain whether legal prohibition of the advertising of infant formula affected the frequency with which formula brand advertisements (including formula brand advertisements) or formula milk advertisements (not including formula brand advertisements) occurred in parenting magazines, the frequencies with which they occurred in British titles was compared with the frequencies with which they occurred in titles published in the USA, Canada or Australia. ANOVAs were conducted using LEGAL REGULATION as the independent variable and Formula Advertising per Page of Advertising as the dependent variable. The distribution of the data did not deviate significantly from normality. Levene’s test of heteroscedasticity was not significant for formula advertisements to pages of advertising, $F(1,87)=1.245$, $p=0.267$, or for formula milk advertisements to pages of advertising, $F(1,87)=1.958$, $p=0.164$. 

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ANOVA revealed that there were more formula advertisements per page of advertising ($F(1,87) = 30.790, p=0.000$) and more formula milk advertisements per page of advertising ($F(1,87) = 6.050, p=0.016$) in British titles than in titles published in countries with no legal measures prohibiting the advertising of infant formula.

Means and standard deviations are reported in table 5.4.

Table 5.4 – Mean ratio of all formula advertisements : pages of advertising

<table>
<thead>
<tr>
<th>Legal Regulation?</th>
<th>Country</th>
<th>Titles</th>
<th>Mean Ratio</th>
<th>Ratio of All Formula Ads : Pages of Ads</th>
<th>SD</th>
<th>Mean Ratio</th>
<th>Ratio of All Formula Ads : Pages of Ads</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>CAN</td>
<td>Today’s Parent</td>
<td>29.05</td>
<td>20.14</td>
<td></td>
<td>27.16</td>
<td>17.84</td>
<td></td>
</tr>
<tr>
<td></td>
<td>USA</td>
<td>Parenting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>USA</td>
<td>Parents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AUS</td>
<td>Australian Practical Parenting</td>
<td>55.43</td>
<td>24.53</td>
<td></td>
<td>39.91</td>
<td>19.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AUS</td>
<td>Australian Parents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>UK</td>
<td>Prima Baby &amp; Pregnancy</td>
<td>55.43</td>
<td>24.53</td>
<td></td>
<td>39.91</td>
<td>19.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UK</td>
<td>Practical Parenting</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>UK</td>
<td>Mother &amp; Baby</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5 OBSERVATIONS

Advertisements that promoted formula products or formula brands occurred in all of the parenting magazines sampled, regardless of whether they were published in countries that restricted the advertising of infant formula products (such as infant and/or follow-on formula) or not. Surprisingly, the highest frequency of formula brand or product advertisements occurred in titles from the United Kingdom where
the advertising of infant formula is legally prohibited and the lowest occurred in magazines from the United States of America and Canada where there are no restrictions on the advertising of infant feeding products. It is not clear why formula advertising was more frequent in titles that were published in the UK but it is clear that neither the British legislation nor the Australian MAIF Agreement reduced the frequency with which formula advertisements appeared in parenting magazines.

However, restrictions on the advertising of certain formula products, whether voluntary or legally binding, did affect which products bearing formula brands were advertised. In titles published in the UK, where it is illegal to advertise infant formula products to the general public, advertisements for follow-on formula occurred much more frequently than they did in titles published in the USA or Canada where infant formula advertising is permitted. Similarly, toddler milk advertisements occurred much more frequently in titles published in Australia, where advertising infant and follow-on formula to the general public is prohibited by industry self regulation, than they did either in titles published in the UK, where follow-on formula advertisements are permitted or in the USA/Canada where both infant and follow on formula can be freely advertised.

This suggests that follow-on formula advertisements replace infant formula advertisements in the UK and toddler milk advertisements replace infant and follow-on formula advertisements in Australia. This supposition is consistent with the observation that follow-on formula promotion is common in countries where steps have been taken to implement the International Code (Baumslag and Michels 1995; Greiner 1991; Nelson, Chan et al. 2004; Palmer 2009; Popkin 1990; Richter 2001). Further support for this idea is found in the observation that 69 advertisements for related services (such as telephone helplines, marketing clubs, free gifts and websites)
or proprietary ingredients (such as Nestle’s Bifidus BL) that clearly shared a brand identity with infant formula appeared in magazines from the UK and Australia, whereas only one such advertisement appeared in magazines from the USA or Canada. It appears that these brand advertisements and their associated marketing strategies are designed to circumvent restrictions on the advertising of infant formula by promoting formula brands and product lines.

Together, studies one and two suggest that mothers perceive toddler milk advertisements to be advertisements for a line of products that includes infant formula and that mothers from Australia may be no less subject to advertising for formula milk products than mothers from the USA or Canada where no restrictions on the advertising of these products is in place. The next chapter describes the results of a third study which utilised a cross-sectional design to investigate whether exposure to toddler milk advertising is associated with attitudes towards infant feeding.
Chapter Six

Study Three: “Look at that. It does get in!”

This chapter describes the conduct, analysis and results of the third of four studies that will be synthesised at the level of interpretation in Chapter Nine. This study utilised survey methodology to examine the relationship between exposure to toddler milk advertising and parents’ attitudes about formula feeding.

1 INTRODUCTION

Intransigently low breastfeeding continuation rates and widespread use of infant formula suggest that the dynamics of the decision to replace breastfeeding with infant formula may not be well understood. An American study of community attitudes about breastfeeding (Hannan, Li et al. 2005) indicated that approximately half of respondents who agreed with the statement, ‘Breastfeeding is healthier for babies than formula feeding,’ simultaneously disagreed with the statement, ‘Infants who are fed infant formula instead of breastmilk are more likely to get sick.’. This suggests that while most respondents understood breastfeeding to be the optimal way to nourish an infant - a course of action that confers health benefits - they were not aware that significant health risks are associated with artificial feeding.

Acceptance of advertising messages about infant formula may contribute to acceptance of the product itself as benign or even healthy. If this is the case acceptance of these messages is also likely to increase formula use. Li and colleagues (2007) reported an increase in the proportion of American respondents to the

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1 During the 1970s and 1980s television advertisements for Colgate Flouriguard toothpaste depicted children’s wonder, exclaiming, ‘Look at that. It does get in!’ in response to the demonstration of blue liquid being absorbed by a stick of white chalk. One of these can be viewed here: http://www.abc.net.au/tv/grunttransfer/stories/s2525691.htm
HealthStyles Survey who agreed with the statement, ‘Infant formula is as good as breastmilk’ from 14.3% in 1999 to 25.7% in 2003. The authors suggest that recent advertising strategies claiming that infant formula products are, or contain ingredients that are, ‘like breastmilk’ might at least partially explain this increase.

As breastfeeding initiation rates have increased, attitudes have emerged as one of the most significant predictors of infant feeding behaviours (both initiation and duration of breastfeeding) amongst Australian mothers. Several studies have found that Australian parents who have positive attitudes towards breastfeeding are more likely to initiate breastfeeding and to breastfeed for longer than those who do not have positive attitudes towards breastfeeding, irrespective of socio-demographic variables. However, to date there has been no investigation of a possible relationship between attitudes towards formula feeding and the use of infant formula. It is possible that positive attitudes towards formula feeding might predict formula use independently of attitudes towards breastfeeding. Certainly it seems plausible that less positive attitudes towards formula feeding, including an awareness that feeding a baby infant formula carries health risks, might discourage formula use.

In the past it has been assumed that positive attitudes towards breastfeeding are incompatible with positive attitudes towards formula feeding. Since population surveys of infant feeding practices in Australia indicate that breastfeeding and formula feeding are not mutually exclusive behaviours even in the first six months, perhaps it is possible for mothers to hold both positive attitudes about breastfeeding and positive (or at least neutral) attitudes about formula feeding simultaneously. This might help explain the high rates of infant formula use amongst breastfeeding mothers in Australia.
Results from another stage of this project confirmed that a group of Australian mothers did not draw a distinction between toddler milk and formula milks represented as breastmilk substitutes suitable for infants less than 12 months old. Furthermore they uncritically accepted advertisers’ claims that formula milk products are healthy or beneficial to a child’s health. This study investigated whether there was any correlation between parents’ ability to recall advertising messages associated with toddler milk advertising and their holding more positive views about the use of infant formula.

2 METHODS

2.1 Purpose and design
This study sought to examine the attitudes of new parents towards infant feeding. Given that this research was concerned with the relationships between a number of attitudinal variables that occur simultaneously, a cross-sectional design was considered appropriate (Aday and Cornelius 2005). Data were collected using a new survey instrument that was developed in consultation with experts in the fields of infant feeding and survey research.

2.2 Recruitment
Recruitment was conducted by intercept at the Pregnancy, Babies and Children (PBC) Expo held in Sydney in May of 2008. The PBC Expo is a large retail trade event that commonly attracts tens of thousands of Sydney parents each year. The expo was chosen because it was expected to be a rich source of parents of children less than five years old.

Potential respondents were approached by a researcher who identified him or herself and his or her affiliation with the University. The researcher first determined that the potential respondent was the parent of a child less than five years of age or expecting
a first baby, and then asked him or her to complete an anonymous survey. In consideration of the time taken to complete the survey, respondents were given the opportunity to win a $400 gift voucher from a major retail chain. Names and contact details collected for this purpose were stored separately from survey responses in order to maintain confidentiality.

Permission to conduct the survey was granted by the organisers of the Pregnancy, Babies and Children Expo. Ethical approval was granted prior to administration of the survey by the Human Research Ethics Committee of the University of Wollongong.

2.3 Sample
A total of 439 surveys were collected over two days. A minimum sample size of 384 was required to achieve a desired precision of $p=0.5$, with a 95% confidence interval. As attitudes towards formula feeding have not been studied in this way before, this estimate was calculated to maximise the sample size and ensure that attitudinal characteristics could be detected by assuming and estimated proportion of 0.50%.

2.4 Instrument
The development of the survey instrument was informed by an examination of the literature addressing the determinants of infant feeding behaviour. Initially a set of possible determinants was identified from the literature and in consultation with experts in the field of infant feeding. In addition to socio-demographic characteristics and exposure to toddler milk advertising/ recall/ product recognition, the domains assessed included: previous infant feeding experience, perceived peer norms, health professional support, feeding difficulties, employment, awareness/acceptance of infant feeding recommendations and attitude towards breastfeeding.
Existing measures within each domain was used to inform item development wherever possible. These included the Iowa Infant Feeding Attitudes Scale (De la Mora, Russell et al. 1999) which has been used to measure Australian parents’ attitudes towards breastfeeding in the months prior to and following the birth of a child (Scott, Shaker et al. 2004; Sittlington, Stewart-Knox et al. 2006); the HealthStyles Survey (Hannan, Li et al. 2005; Li, Rock et al. 2007) which has been used to measure community attitudes around breastfeeding and formula feeding in America; and the UKDoH/NOPWorld survey (NOP World for Department of Health 2005) which has been used to measure British mothers’ recall of advertising messages related to formula milks.

The final survey (Appendix 1) consisted of four main sections. Section One contained 12 statements about breastfeeding and 14 statements about formula feeding. Respondents were asked to indicate their level of agreement with each statement on a five point likert scale ranging from strongly disagree to strongly agree. Section Two contained a series of questions about the respondents’ experiences of infant feeding (their own if they were mothers or their partners’ if they were fathers) and their perceptions of the practices of their friends. Section Three examined respondents’ awareness of recommendations concerning infant feeding practices while Section Four contained a series of questions related to infant formula product advertising.

Two versions of the survey were produced. The two versions differed only in the order of the items presented and this was done in order to determine whether question order affected the responses.

In order to test for comprehension and face validity, the survey was piloted with a convenience sample of 20 parents of children less than five years old recruited from a congregation of the Anglican Church in Australia.
2.5 Data analysis

Exploratory factor analysis was employed to examine response patterns in order to determine whether the data generated by the 22 attitude items\(^2\) could be reduced to a smaller number of factors (Hair, Anderson et al. 1998).

Given that the primary purpose of the analysis was examination of the underlying structure of the data to identify latent factors, principal axis factoring was identified as the appropriate model. This model has the advantage of eliminating unique and error variance from the solution (Hair, Anderson et al. 1998).

Since the original attitude items were designed to assess attitudes around infant feeding (breastfeeding and formula feeding) it was assumed that they would be correlated to some extent and so the resulting factors were also expected to be correlated. Thus an oblique rotation (direct oblimin with Kaiser Normalisation) was deemed most appropriate. Oblique factor solutions are thought to be more realistic because in reality very few variables are uncorrelated (Hair, Anderson et al. 1998). In order to confirm the appropriateness of oblique rotation, an orthogonal (varimax with Kaiser Normalisation) was also performed.

The items that loaded on each factor were tested for reliability by calculating Cronbach’s alpha (co-efficient alpha). The factor scores generated by factor analysis were then used in place of the original set of 22 attitude items to facilitate subsequent analysis. Factors with eigenvalues >1 were extracted. The threshold for significant of factor loadings (at 5% significance level) was 0.3. This value was selected as a conservative estimate of significance, given the sample size and number of variables.

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\(^2\) Responses to items 4 (A two year old is too old to be fed from a baby bottle), 11 (A one year old is too old to be fed from a baby bottle), 20 (A two year old is too old to be breastfed) and 22 (A two year old is too old to be breastfed) were not included in the factor analysis because they were designed to examine attitudes about feeding toddlers rather than attitudes about infant feeding methods per se.
(Hair, Anderson et al. 1998). Given a sample larger than 50, it is generally accepted that factor loadings >0.3 are significant; loadings >0.4 are important; and loadings >0.5 are very important (Hair, Anderson et al. 1998). These assumptions were used to inform interpretation of the factor solution.

One-way ANOVA and post-hoc Tukey’s Honestly Significant Difference tests were used to explore relationships between factor scores and categorical variables. Variables with statistically significant relationships (α= 0.05) with factor scores were selected for inclusion in a multiple regression analysis.

3 RESULTS

3.1 Socio-demographics

3.1.1 Gender

A total of 415 responses to the gender item were collected. Of those, 343 (82.7%) indicated that they were female (mothers or expectant mothers), 51 (12.3%) indicated that they were male (fathers or expectant fathers) and 21 (5.1%) did not answer the question. Since more than 10% of respondents indicated that they were male they were not considered to be outliers and their responses were included in the analysis (Tabachnick and Fiddell 1996).

3.1.2 Age

Figure 6.1 illustrates the age profile of the sample (not including fathers) and compares it to national data on the age profile of mothers who gave birth in NSW in 2006. The pattern of responses suggests that the sample contained more respondents aged between 25 and 29 years than the population of NSW parents (Laws and Hilder 2008). This is probably because close to 60% of the sample were first time parents.

Figure 6.1 – Age profile of respondents
Fathers tended to be older than mothers. Seventy three percent of fathers were over the age of 35 compared with 47.8% of mothers, $\chi^2 (1, 392) = 11.239, p = 0.001$. This reflects the pattern observed in national census data (Laws and Hilder 2008). Age was not significantly related to any other demographic variables.

3.1.3 Marital status

A total of 401 respondents indicated their marital status. Of those, 382 (95.3%) indicated they were married or living with a partner. Given that 318 (77%) of respondents were either expecting a first child or had a child who was less than 18 months old, this pattern of responses reflects that found in the 2006 National Census where fewer than 5% of children were born into lone-parent families and more than 80% of families whose youngest child was less than 5 years old were two parent households in which the only resident children were the natural or adopted children of both parents (Australian Bureau of Statistics 2008).

3.1.4 Income

The distribution of income was similar amongst responses to this survey and those collected by the Longitudinal Study of Australia’s Children (LSAC). Average gross
annual income amongst respondents for this study fell in the $25 000 and $75 000 bracket. The average gross annualised weekly income in households reported in the LSAC that included a child between four and 13 months of age in 2004 was $62 452 per annum and $65 935 per annum in those households that included a four year old (Baxter, Gray et al. 2007).

3.1.5 Education

Of the 401 respondents who indicated their highest educational attainment approximately half (51.7%) had either undergraduate or postgraduate qualifications. No gender difference was detected. Data collected for the Longitudinal Study of Australian Children (Donath and Amir 2008) indicate that mothers of infants born between March 2003 and February 2004 were less likely to hold undergraduate or postgraduate qualifications (34.7%) than those recruited for this study, perhaps because recruitment was conducted in a major city.

3.1.6 Parity

A total of 349 respondents indicated that they had one or more children, and the majority (58.7%) reported that they were the parents of only one child. The next largest group (17.9%) were parents of two children; only 35 (8.7%) were the parents of three or more children and the remainder (14.7%) indicated they were expecting a first child.

As would be expected, given the recruitment strategy, the vast majority of respondents (82.7%) were the parents of a child less than two and a half years old; 37.8% had a child less than 18 months old and 27.3% had a child less than six months old. Only 26.9% had a child who was more than two and a half years old.
3.2 Infant feeding practices
Both breastfeeding and formula feeding were very common. The majority (89.2%) of those who had one or more children indicated that they had breastfed at least one of their children and most of them (76.2%) had also fed at least one of their children infant formula.

Mixed feeding was also common amongst respondents. More than one in three (34.9%) respondents indicated that they had fed their first child formula before that child reached the age of six months. This is much lower than the proportion of infants fed infant formula prior to six months reported by Gabriel and colleagues (2005). This is most likely to be because maternal recall of age at introduction of foods or fluids other than breastmilk is subject to recall bias and affected by a tendency to offer socially acceptable responses (Li, Scanlon et al. 2005).

3.3 Knowledge and acceptance of infant feeding recommendations
In order to gauge awareness and acceptance of public health recommendations about exclusive breastfeeding respondents were asked, ‘Ideally, for how long do you think babies should be fed nothing but breastmilk?’. Of the 399 respondents who answered this question, 58.3% gave answers that were consistent with the WHO and NHMRC recommendation of 6 months exclusive breastfeeding. More than a quarter of responses (25.8%) were inconsistent with the recommendations and 6% indicated that they didn’t know. A significant proportion of respondents (9.3%) indicated that babies should be fed nothing but breastmilk ‘for as long as possible’. This response is ambiguous and although it might suggest a belief that babies should be exclusively breastfed for longer than is recommended, the prevalence of mixed feeding reported in the sample suggests that it is more likely that it reflects a lack of confidence in the
capacity of mothers to adequately nourish their infants on breastmilk alone for six months.

Respondents were also asked about their awareness and acceptance of public health recommendations related to the duration of breastfeeding and of bottle feeding. These questions enabled a comparison of the social acceptability of breast and bottle feeding older babies. The results are reported in Table 6.1.

Table 6.1 – Acceptance of recommended breast and bottle feeding durations

<table>
<thead>
<tr>
<th>At what age do you think mothers should stop giving breastfeeds altogether?</th>
<th>At what age do you think mothers should stop giving bottles?</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 12 months</td>
<td>8.5%</td>
</tr>
<tr>
<td>12 months</td>
<td>4.5%</td>
</tr>
<tr>
<td>13-23 months</td>
<td>24.8%</td>
</tr>
<tr>
<td>≥ 24 months</td>
<td>24.8%</td>
</tr>
<tr>
<td>Baby led</td>
<td>15.5%</td>
</tr>
<tr>
<td>Don’ know</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

More respondents thought that breastfeeding should cease at or before 12 months than thought bottle feeding should. Similarly more respondents thought that bottle feeding should continue beyond 12 months than thought breastfeeding should. The differences were particularly marked at the extremes. For example, the belief that infants should cease bottle feeding before 12 months was about half as common as the belief that infant should cease breastfeeding before 12 months. Similarly about twice as many respondents thought bottle feeding should continue into a child’s third year as thought breastfeeding should continue into a child’s third year. It should also be noted that 31.5% of respondents indicated that breastfeeding should cease when an infant reaches 12 months of age.
3.4 Attitudes about feeding older babies

A series of four questions were devised to measure attitudes about breastfeeding and bottle feeding older babies and toddlers. Responses are reported in Table 6.2.

Table 6.2 – Attitudes about feeding older babies

<table>
<thead>
<tr>
<th>Item</th>
<th>A or SA</th>
<th>Neither</th>
<th>D or SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A one year old is too old to be breastfed.</td>
<td>15.3</td>
<td>21.8</td>
<td>63.0</td>
</tr>
<tr>
<td>A one year old is too old to be fed from a baby bottle.</td>
<td>9.2</td>
<td>15.5</td>
<td>75.3</td>
</tr>
<tr>
<td>A two year old is too old to be breastfed.</td>
<td>53.0</td>
<td>20.6</td>
<td>26.4</td>
</tr>
<tr>
<td>A two year old is too old to be fed from a baby bottle.</td>
<td>46.0</td>
<td>24.2</td>
<td>29.8</td>
</tr>
</tbody>
</table>

Larger proportions of respondents approved of bottle feeding one and two year olds than approved of breastfeeding babies and children the same age. More than one and a half times as many respondents thought a one year old too old to be breastfed (9.2%) as thought a one year old too old to be bottle fed (15.3%). Similarly, 20% more respondents thought a two year old too old to be breastfed (46.0%) than thought a two year old too old to be bottle fed (53.0%)

As was observed in the responses to the questions addressing respondents’ awareness and acceptance of public health recommendations about the duration of breast and bottle feeding, inconsistency was apparent in the responses to these items. Only 53.4% of those who agreed or strongly agreed that a two year old is too old to be breastfed also believed that a two year old is too old to be fed from a baby bottle. Over a quarter (26.6%) of those who agreed or strongly agreed that a two year old is too old to be breastfed disagreed or strongly disagreed with the statement ‘a two year old is too old to be fed from a baby bottle’.

3.5 Peer infant feeding norms

In order to gauge perceptions of the usual infant feeding practices undertaken by their peers, respondents were asked to respond to a series of three statements about the usual infant feeding practices of their peers. The responses are reported in Table 6.3.
Table 6.3 – Peer norms

<table>
<thead>
<tr>
<th>Perceived Peer Norm</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before introducing solids, most of my friends who are mothers …</strong></td>
<td></td>
</tr>
<tr>
<td>never feed their babies formula</td>
<td>14.8</td>
</tr>
<tr>
<td>combine breastfeeding and formula feeding</td>
<td>56.7</td>
</tr>
<tr>
<td>only feed their babies formula</td>
<td>11.4</td>
</tr>
<tr>
<td>Don’t know</td>
<td>17.0</td>
</tr>
<tr>
<td><strong>Most of my friends who are mothers …</strong></td>
<td></td>
</tr>
<tr>
<td>never use any formula</td>
<td>7.8</td>
</tr>
<tr>
<td>start using formula before six months</td>
<td>40.1</td>
</tr>
<tr>
<td>start using formula between 6 and 12 months</td>
<td>34.8</td>
</tr>
<tr>
<td>start using formula after 12 months</td>
<td>4.9</td>
</tr>
<tr>
<td>Don’t know</td>
<td>12.4</td>
</tr>
<tr>
<td><strong>Most of my friends who are mothers …</strong></td>
<td></td>
</tr>
<tr>
<td>never breastfeed their babies</td>
<td>2.7</td>
</tr>
<tr>
<td>breastfeed for less than 6 months</td>
<td>36.0</td>
</tr>
<tr>
<td>breastfeed for between 6 and 11 months</td>
<td>40.6</td>
</tr>
<tr>
<td>breastfeed for between 12 and 17 months</td>
<td>10.7</td>
</tr>
<tr>
<td>breastfeed for between 18 months and 2 years</td>
<td>1.5</td>
</tr>
<tr>
<td>breastfeed for more than 2 years</td>
<td>0.5</td>
</tr>
<tr>
<td>Don’t know</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Most respondents believed that mixed feeding was the usual practice amongst their peers. More than half believed that their peers fed their babies a combination of infant formula and breastmilk before introducing solids. Three quarters believed that it was usual for their peers to feed their babies formula before 12 months, and more than three quarters believed that it was usual for their peers to stop breastfeeding before 12 months.

3.6 Advertising exposure and recall

Almost all respondents (92.1%) reported that they had seen an advertisement for ‘formula’. Of those, 93.3% indicated that they had seen an advertisement that did not originate from a retailer (such as a supermarket or pharmacy catalogue). Fewer than half the respondents (44.5%) indicated that they had seen formula advertised by retailers.
In order to measure whether respondents believed that they had seen advertisements for infant or follow on formula, they were asked to indicate the type(s) of formula they had seen advertised. Most respondents (66.8%) reported that they had seen a formula product suitable from birth (infant formula) advertised. Fewer than half (45.1%) indicated that they had seen a formula product suitable from 4-6 months (follow-on formula) advertised. More than half (55.9%) reported that they had seen a formula product suitable from 12 months (toddler milk) advertised.

In order to ascertain whether these advertisements for toddler milk and other products are commonly understood to be advertisements for infant formula, a contingency table analysis was conducted to establish whether there was a significant relationship between the type of advertisements respondents had seen (retail or non-retail) and having reported seeing an advertisement for infant formula. In order to determine whether the type of advertisement seen affected whether respondents believed they had seen an advertisement for infant formula, respondents who reported having seen both retail and non-retail formula advertisements were excluded from this analysis. A significant relationship was found between the variables, $\chi^2(df = 1, n=238) = 19.423$. More than twice as many respondents who indicated they had seen only non-retail formula advertisements (67.0%) believed that they had seen an advertisement for infant formula as those who indicated they had only seen a retail formula advertisement (28.9%).

Respondents were asked to indicate which, if any, of five infant formula products (Heinz Nurture Gold Starter; Nutricia Karicare Gold Plus From Birth; Bellamy’s Organic Infant Formula; Nestle Nan 1 Gold Starter and Wyeth S26 Gold Alpha Pro) depicted on the questionnaire they had seen advertised. Full colour pack-shots of infant formula taken from advertisers’ websites were used for this question. These
were reproduced at approximately the same size as pack shots that appear in toddler formula advertisements. Infant formula pack-shots were used in order to provide confirmation of whether respondents believed they had seen infant formula advertised. Responses are reported in Table 6.4. Close to three quarters (74.3%) of respondents believed that they had seen an advertisement for Wyeth S26 Alpha Pro infant formula and a similar proportion (72.8%) believed they had seen an advertisement for Karicare Gold Plus Infant Formula. More than half (52.1%) believed they had seen an advertisement for Heinz Nurture Gold Starter infant formula and more than a third (35.0%) believed they had seen an advertisement for Nestle Nan 1 Gold Starter infant formula. Just over a fifth (21.5%) believed they had seen Bellamy’s Organic Step 1 Infant Formula. On average respondents indicated that they had seen 2.5 infant formula products advertised.

<table>
<thead>
<tr>
<th>Product</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wyeth S26 Gold Alpha Pro</td>
<td>74.3</td>
</tr>
<tr>
<td>Karicare Gold Plus Infant Formula</td>
<td>72.8</td>
</tr>
<tr>
<td>Heinz Nurture Gold Starter</td>
<td>52.1</td>
</tr>
<tr>
<td>Nestle Nan 1 Gold Starter</td>
<td>35.0</td>
</tr>
<tr>
<td>Bellamy’s Organic Step 1 Infant Formula</td>
<td>21.5</td>
</tr>
</tbody>
</table>

Almost all respondents (91.0%) indicated that they had seen advertisements for at least one of the infant formula products depicted, regardless of the number or children they had \( \chi^2(DF = 2, n = 392) = 1.243, p >0.5 \). This result persisted after excluding those who had seen retail formula advertisements (which could have been for infant formula, follow-on formula or toddler milk).

Respondents were asked to indicate which, if any, of seven advertising claims they recognised. More than 90% of respondents recognised at least one advertising
message. On average, respondents recognised 2.6 advertising messages. Results are reported in Table 6.5.

Table 6.5 – Advertising message recognition

<table>
<thead>
<tr>
<th>Message</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains nutrients such as Omega3, iron or probiotics</td>
<td>69.9</td>
</tr>
<tr>
<td>Ensures proper growth and development</td>
<td>52.9</td>
</tr>
<tr>
<td>Improves brain development</td>
<td>32.9</td>
</tr>
<tr>
<td>Makes babies healthy/happy</td>
<td>30.6</td>
</tr>
<tr>
<td>Is convenient</td>
<td>29.1</td>
</tr>
<tr>
<td>Is like breastmilk</td>
<td>27.1</td>
</tr>
<tr>
<td>Strengthens immunity</td>
<td>25.1</td>
</tr>
</tbody>
</table>

Almost 70% indicated that the formula advertisement(s) they had seen claimed that the product contained nutrients such as omega 3, iron or probiotics. More than half (52.9%) indicated that they had seen a formula advertisements claiming that the product ensures proper growth and development. Close to a third indicated that they had seen a formula advertisement claiming that the product improves babies’ brain development. More than one in four respondents indicated that they had seen a formula advertisement claiming that the product ‘is like breastmilk’ or ‘strengthens immunity’.

Advertising of infant and follow-on formulas are prohibited by the MAIF Agreement in Australia but variations of these claims appear in advertisements for toddler milks. For example, the Heinz Nurture Gold Toddler advertisement pictured in Chapter Five contains the text, “Formulated with NPD, a unique scientific combination of nutrients, it includes pre and pro biotics and more Omega 3 DHA than any other ...”; the Nutricia Karicare Gold PLUS Toddler advertisement begins with the banner headline, “How to support your toddlers’ immunity” and moves on to claim that “Probiotics, found naturally in breast milk, help children build immunity against infection and
allergy Mums can now ensure toddlers benefit from probiotics when they use Karicare Toddler GOLD plus”; and the Wyeth S26 Gold Toddler advertisements states, “S26 Toddler GOLD, with the advanced Wyeth Biofactors System, provides an age appropriate combination of nutrients to help support their cognitive, visual and physical development”.

3. 7  **Attitude items**
Respondents were asked to indicate how strongly they agreed or disagreed with a series of 26 items. Twenty two of these items measured attitudes about infant feeding and the remaining four items measured attitudes about breastfeeding or bottle feeding children more than 12 months old. Responses to the 22 infant feeding attitude items are reported in Table 6.6.
In order to gauge whether respondents who agreed that ‘breastfed babies are healthier than formula fed babies’ also understood that formula feeding carries health risks, six items addressed respondents’ beliefs about the health implications of infant feeding. Table 6.7 reports the proportion of those who agreed or strongly agreed with the statement, ‘Breastfed babies are healthier than formula fed babies’ who also agree or strongly agreed with other statements about the implications of infant feeding practices.

<table>
<thead>
<tr>
<th>Item</th>
<th>SD</th>
<th>D</th>
<th>neither</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most mothers have to feed their babies some formula.</td>
<td>16.6</td>
<td>27.6</td>
<td>26.2</td>
<td>26.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Breastfeeding mothers should not drink any alcohol.</td>
<td>2.7</td>
<td>12.6</td>
<td>12.1</td>
<td>30.9</td>
<td>41.8</td>
</tr>
<tr>
<td>Babies who are fed formula instead of breastmilk are more likely to</td>
<td>19.2</td>
<td>30.7</td>
<td>37.2</td>
<td>10.9</td>
<td>1.9</td>
</tr>
<tr>
<td>be admitted to hospital than babies who are only breastfed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers who eat an unhealthy diet should formula feed their babies.</td>
<td>14.6</td>
<td>37.6</td>
<td>25.7</td>
<td>14.3</td>
<td>4.1</td>
</tr>
<tr>
<td>Mothers who smoke should formula feed their babies.</td>
<td>6.3</td>
<td>20.6</td>
<td>25.7</td>
<td>26.9</td>
<td>20.4</td>
</tr>
<tr>
<td>Formula fed babies are just as healthy as breastfed babies.</td>
<td>3.2</td>
<td>19.5</td>
<td>24.6</td>
<td>33.9</td>
<td>18.8</td>
</tr>
<tr>
<td>It is common for mothers to be unable to make enough breast milk</td>
<td>8.5</td>
<td>22.7</td>
<td>25.4</td>
<td>33.4</td>
<td>10.0</td>
</tr>
<tr>
<td>for their babies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers should not breastfeed in public places.</td>
<td>73.4</td>
<td>18.6</td>
<td>3.6</td>
<td>2.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Breastfed babies are healthier than formula fed babies.</td>
<td>10.4</td>
<td>20.6</td>
<td>27.4</td>
<td>26.2</td>
<td>15.3</td>
</tr>
<tr>
<td>Breastfeeding makes a mother’s life easier.</td>
<td>5.4</td>
<td>15.7</td>
<td>27.0</td>
<td>30.1</td>
<td>21.8</td>
</tr>
<tr>
<td>Feeding a baby formula, even just once, increases the chances a</td>
<td>35.6</td>
<td>40.5</td>
<td>16.6</td>
<td>4.6</td>
<td>2.7</td>
</tr>
<tr>
<td>baby will get sick.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers who have to take prescribed medicines should not breastfeed.</td>
<td>5.3</td>
<td>22.1</td>
<td>40.3</td>
<td>21.4</td>
<td>10.9</td>
</tr>
<tr>
<td>It is harder for fathers of breastfed babies to bond with their</td>
<td>31.6</td>
<td>38.1</td>
<td>15.5</td>
<td>11.4</td>
<td>3.4</td>
</tr>
<tr>
<td>babies.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfed babies who are given a bottle of formula before bed sleep</td>
<td>9.5</td>
<td>24.3</td>
<td>39.8</td>
<td>23.1</td>
<td>3.4</td>
</tr>
<tr>
<td>longer at night.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formula feeding mothers get more help and support from family and</td>
<td>17.2</td>
<td>33.7</td>
<td>28.6</td>
<td>17.2</td>
<td>3.4</td>
</tr>
<tr>
<td>friends that breastfeeding mothers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding has health benefits for mothers.</td>
<td>1.5</td>
<td>2.7</td>
<td>13.3</td>
<td>43.7</td>
<td>38.8</td>
</tr>
<tr>
<td>It is too hard for a mother to keep breastfeeding if she has to go</td>
<td>7.3</td>
<td>23.8</td>
<td>17.5</td>
<td>40.0</td>
<td>11.4</td>
</tr>
<tr>
<td>back to work or study.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modern infant formulas are as good as breastmilk.</td>
<td>16.5</td>
<td>31.8</td>
<td>23.3</td>
<td>22.3</td>
<td>6.1</td>
</tr>
<tr>
<td>Formula feeding makes a mother’s life easier.</td>
<td>8.8</td>
<td>28.3</td>
<td>35.1</td>
<td>23.7</td>
<td>4.1</td>
</tr>
<tr>
<td>It is harder for formula feeding mothers to bond with their babies.</td>
<td>32.4</td>
<td>42.1</td>
<td>18.0</td>
<td>6.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Babies who are fed formula instead of breastmilk are more likely to</td>
<td>15.0</td>
<td>29.4</td>
<td>35.2</td>
<td>17.7</td>
<td>2.7</td>
</tr>
<tr>
<td>become overweight or obese.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is possible to overcome nearly all breastfeeding problems.</td>
<td>10.0</td>
<td>20.1</td>
<td>23.8</td>
<td>35.8</td>
<td>10.3</td>
</tr>
</tbody>
</table>
Table 6.7 – Proportion of those who believe breastfed babies are healthier than formula fed babies

<table>
<thead>
<tr>
<th>Item</th>
<th>A or SA</th>
<th>Neither</th>
<th>D or SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula fed babies are just as healthy as breastfed babies</td>
<td>21.6%</td>
<td>32.3%</td>
<td>46.1%</td>
</tr>
<tr>
<td>Modern infant formulas are just as good as breastmilk</td>
<td>11.6%</td>
<td>17.6%</td>
<td>71.2%</td>
</tr>
<tr>
<td>Babies who are fed formula instead of breastmilk are more likely to be admitted to hospital</td>
<td>28.0%</td>
<td>48.8%</td>
<td>23.2%</td>
</tr>
<tr>
<td>Babies who are fed formula instead of breastmilk are more likely to become overweight or obese</td>
<td>37.9</td>
<td>34.9</td>
<td>27.2</td>
</tr>
<tr>
<td>Feeding a baby formula, even just once, increases the chances the baby will get sick</td>
<td>9.4</td>
<td>22.9</td>
<td>67.6</td>
</tr>
</tbody>
</table>

In spite of strong evidence that formula fed babies are at higher risk of both infection and chronic disease (Horta, Bahl et al. 2007; Ip, Chung et al. 2007; Oddy 2001, 2004; Oddy and Peat 2003), some incongruence was observed amongst these responses. More than a fifth of those who agreed or strongly agreed with the statement, ‘Breastfed babies are healthier than formula fed babies’ also agreed or strongly agreed with the statement, ‘Formula fed babies are just as healthy as breastfed babies’. More than one in ten (11.6%) believed that ‘modern infant formulas are just as good as breastmilk’.

Over the last decade strong evidence of a dose relationship between formula feeding and infectious morbidity requiring hospitalisation in the developed world has emerged (Bachrach, Schwarz et al. 2003; Kramer, Chalmers et al. 2001; Paricio Talayero, Lizen-Garcia et al. 2006; Quigley, Kelly et al. 2009). However, fewer than a quarter (23.2%) of those who believed that breastfed babies are healthier than formula fed babies also believed that ‘Babies who are fed formula instead of breastmilk are more likely to be admitted to hospital’. A number of studies have found that artificially fed individuals are more likely to be obese or overweight in adulthood after controlling for confounders. Yet more than a quarter of those who believed that breastfed babies are healthier than formula fed babies did not believe that ‘Babies who are fed formula instead of breastmilk are more likely to become overweight or obese’ (Horta, Bahl et
There is some evidence that a single exposure to infant formula increases the risk of illness (Bahl, Frost et al. 2005; Kramer and Kakuma 2004; Oddy, Holt et al. 1999) but only 9.4% of respondents who believed that breastfed babies are healthier than their formula fed counterparts also believed that ‘Feeding a baby formula, even just once, increases that chances the baby will get sick’.

Responses also indicated that there is considerable uncertainty around the implications of infant feeding decisions. Large proportions of respondents indicated that they neither agreed nor disagreed with the statements, ‘Formula fed babies are just as healthy as breastfed babies’ (32.3%), ‘Modern infant formulas are just as good as breastmilk’ (17.6%), ‘Babies who are fed formula instead of breastmilk are more likely to be admitted to hospital’ (48.8%) and ‘Feeding a baby formula, even just once, increases the chances the baby will get sick’ (22.9%).

3.8 Exploratory factor analysis
Exploratory factor analysis was used to reduce the 22 attitudinal items to their underlying (latent) factors. Preliminary analyses were conducted using orthogonal and oblique rotations in order to determine the solution of best fit. Comparison of the two solutions revealed a similar pattern of factors. However, the oblique rotation yielded a cleaner factor structure with fewer cross-loadings suggesting that an oblique solution was most appropriate.

Prior to interpreting the analysis, the data were examined to ensure that all the assumptions were met. Examination of graphic depictions of the data indicated that responses to the 22 attitude items were approximately normally distributed as required (Howell 2002). Additionally, although maximum Mahalanobis distance exceeded the critical $\chi^2$ value for $df=22(\alpha=0.001)$ of 48.27 (indicating the presence of multivariate
outliers), maximum Cook’s distance was small (0.035) indicating that the influence of
the outliers was not significant (Howell 2002). A linear relationship was identified
amongst the variables and squared multiple correlations were small. Therefore all
assumptions were judged to have been met.

An initial factor matrix was generated for the 22 attitude items and oblique rotation
applied. The Kaiser-Meyer-Oklin measure of Sampling Adequacy (KMO = 0.838)
was > 0.6. Bartlett’s Test of Sphericity was significant ($\chi^2 = 1822.084, p = 0.000$).
These two criteria indicated that the information contained in these items could be
reduced to a smaller set of meaningful factors by the application of principle axis
factoring. Inspection of the anti-image correlation matrix revealed that all measures
of sampling adequacy exceeded 0.5. Five factors with eigenvalues > 1 were
generated and these accounted for 52.9% of the variance.

Items 1 (Most mothers have to feed their babies some formula), 9 (Mothers should not
breastfeed in public places) and 18 (Breastfeeding has health benefits for mothers)
failed to load at a significant level on any of the factors generated. Examination of
the distribution of responses for these items revealed that there was little variance in
the responses to these questions. These items also had low communalities compared
with other items. As these items did not contribute to the model, they were excluded
and that analysis repeated.

Four factors with eigenvalues >1 were generated and these accounted for 49.6% of
the variance in the responses. The Kaiser-Meyer-Oklin measure of sampling
adequacy was >0.8 and Bartlett’s Test of Sphericity achieved significance at the level
of 0.000. Inspection of the anti-image correlation matrix revealed that all measures of
sampling adequacy ranged from 0.7 to 0.9.
The final pattern matrix (Table 6.8) shows variables loading significantly on each of the four factors. The analysis produced a clean factor structure with all items loading on coherent factors and only one complex item (It is harder for formula feeding mothers to bond with their babies). Interpretation of the factor solution was guided by the parameters described above (see 2.5 Data Analysis). Items with the largest (absolute) factor correlations were afforded the most weight when assigning factor labels (Howell 2002).

Factor 1 accounted for 22.3% of the variance. The items with the largest loadings (> 0.75) were item 7 (Formula fed babies are just as healthy as breastfed babies), which loaded positively, and item 10 (Breastfed babies are healthier than formula fed babies) which loaded negatively. The other item with a large positive loading was item 21 (Modern infant formulas are as good as breastmilk). Other items with a large negative loading were item 3 (Babies who are fed formula instead of breastmilk are more likely to be admitted to hospital than babies who are only breastfed) and item 25 (Babies who are fed formula instead of breastmilk are more likely to become overweight or obese). Item 24 (It is harder for the mothers of formula fed babies to bond with their babies) also loaded weakly on this factor. Given this pattern of results, this factor was labelled ‘Positive attitude towards formula feeding’. A high score in on this factor indicates a belief that formula feeding is a benign alternative to breastfeeding and a low score indicates a belief that formula feeding carries health risks for babies. Coefficient (Cronbach’s) alpha for the seven items that loaded on this factor was 0.8.
Table 6.8 – Pattern Matrix with eigenvalues

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Breastfeeding mothers should not drink any alcohol.</td>
<td>Positive attitude towards FF</td>
</tr>
<tr>
<td>3. Babies who are fed formula instead of breastmilk are more likely to be admitted to hospital than babies who are only breastfed.</td>
<td>BF burden on mother</td>
</tr>
<tr>
<td>5. Mothers who eat an unhealthy diet should formula feed their babies.</td>
<td>BM is easily compromised</td>
</tr>
<tr>
<td>6. Mothers who smoke should formula feed their babies.</td>
<td>Positive attitude toward BF</td>
</tr>
<tr>
<td>7. Formula fed babies are just as healthy as breastfed babies.</td>
<td></td>
</tr>
<tr>
<td>8. It is common for mothers to be unable to make enough breast milk for their babies.</td>
<td></td>
</tr>
<tr>
<td>10. Breastfed babies are healthier than formula fed babies.</td>
<td></td>
</tr>
<tr>
<td>13. Feeding a baby formula, even just once, increases the chances a baby will get sick.</td>
<td></td>
</tr>
<tr>
<td>14. Mothers who have to take prescribed medicines should not breastfeed.</td>
<td></td>
</tr>
<tr>
<td>15. It is harder for fathers of breastfed babies to bond with their babies.</td>
<td></td>
</tr>
<tr>
<td>16. Breastfed babies who are given a bottle of formula before bed sleep longer at night.</td>
<td></td>
</tr>
<tr>
<td>17. Formula feeding mothers get more help and support from family and friends that breastfeeding mothers.</td>
<td></td>
</tr>
<tr>
<td>19. It is too hard for a mother to keep breastfeeding if she has to go back to work or study.</td>
<td></td>
</tr>
<tr>
<td>21. Modern infant formulas are as good as breastmilk.</td>
<td></td>
</tr>
<tr>
<td>23. Formula feeding makes a mother's life easier.</td>
<td></td>
</tr>
<tr>
<td>24. It is harder for formula feeding mothers to bond with their babies.</td>
<td></td>
</tr>
<tr>
<td>25. Babies who are fed formula instead of breastmilk are more likely to become overweight or obese.</td>
<td></td>
</tr>
<tr>
<td>26. It is possible to overcome nearly all breastfeeding problems.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Positive attitude towards FF</th>
<th>BF burden on mother</th>
<th>BM is easily compromised</th>
<th>Positive attitude toward BF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>4.24</td>
<td>2.39</td>
<td>1.64</td>
<td>1.16</td>
</tr>
</tbody>
</table>

2. Breastfeeding mothers should not drink any alcohol. .393
3. Babies who are fed formula instead of breastmilk are more likely to be admitted to hospital than babies who are only breastfed. -.675
5. Mothers who eat an unhealthy diet should formula feed their babies. .566
6. Mothers who smoke should formula feed their babies. .460
7. Formula fed babies are just as healthy as breastfed babies. .768
8. It is common for mothers to be unable to make enough breast milk for their babies. .301
10. Breastfed babies are healthier than formula fed babies. -.827
12. Breastfeeding makes a mother’s life easier. .648
13. Feeding a baby formula, even just once, increases the chances a baby will get sick. .391
14. Mothers who have to take prescribed medicines should not breastfeed. .602
15. It is harder for fathers of breastfed babies to bond with their babies. .553
16. Breastfed babies who are given a bottle of formula before bed sleep longer at night. -.370
17. Formula feeding mothers get more help and support from family and friends that breastfeeding mothers. .407
19. It is too hard for a mother to keep breastfeeding if she has to go back to work or study. -.403
21. Modern infant formulas are as good as breastmilk. .577
23. Formula feeding makes a mother’s life easier. -.494
24. It is harder for formula feeding mothers to bond with their babies. -.335 .478
25. Babies who are fed formula instead of breastmilk are more likely to become overweight or obese. -.478
26. It is possible to overcome nearly all breastfeeding problems. .468
Factor 2 accounted for 12.56% of the variance. Item 15 (It is harder for fathers of breastfed babies to bond with their babies) and item 24 (It is harder for formula feeding mothers to bond with their babies) had the largest loadings on this factor and so were afforded the most weight in the labelling decision. Given that there is some evidence that mothers fear social sanction if they fail to facilitate father/infant bonding (Howell 2002), the pattern of results suggests those respondents who returned a high score on this factor believed that the moral responsibilities or burdens associated with breastfeeding fall most significantly on mothers. Therefore the factor was labelled ‘Breastfeeding Burden on Mothers’. The other two items that loaded on this factor were item 17 (Formula feeding mothers get more help and support from family and friends) and item 13 (Feeding a baby formula, even just once, increases the chances the baby will get sick). All of the loadings on this factor were in the positive direction. Coefficient (Cronbach’s) alpha for the four items that loaded on this factor was 0.5.

Factor 3 accounted for 8.60% of the variance. The four items that loaded on this factor all loaded strongly (> 0.39) in the positive direction. They were item 2 (Breastfeeding mothers should not drink any alcohol), item 5 (Mothers who eat an unhealthy diet should formula feed their babies), item 6 (Mothers who smoke should formula feed their babies), and item 14 (Mothers who have to take prescribed medicines should not breastfeed). Given this pattern of results, this factor was labelled ‘Breastmilk easily compromised’. A high score on this factor indicates a belief that the quality of a mother’s breastmilk is easily compromised by the mother’s lifestyle choices. Coefficient (Cronbach’s) alpha for the four items that loaded on this factor was 0.6.
Factor 4 accounted for 6.10% of the variance. The item with the largest loading on this factor was item 12 (Breastfeeding makes a mother’s life easier). It was the only item to load on this factor in the positive direction. Item 23 (Formula feeding makes a mother’s life easier) had a large negative loading, as did item 26 (It is possible to overcome almost all breastfeeding problems) and item 19 (It is too hard for a mother to keep breastfeeding if she has to go back to work or study). Given this pattern of results, this factor was labelled ‘Positive attitude towards breastfeeding’. A high score on this factor indicates a belief that breastfeeding makes mothers’ lives easier (or that breastfeeding is achievable; it can be easily integrated into mothers’ lives). A low score on this factor indicates a belief that breastfeeding complicates mothers’ lives (or that breastfeeding is not achievable; it is difficult to integrate into mothers’ lives). Coefficient (Cronbach’s) alpha for the four items that loaded on this factor was 0.6.

Correlations between the factors were weak (< absolute 0.21) and are presented in Table 6.9.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Positive attitude towards FF</th>
<th>BF burdens on mother</th>
<th>BM is easily compromised</th>
<th>Positive attitude towards BF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive attitude towards FF</td>
<td>1.00</td>
<td>-0.17</td>
<td>0.14</td>
<td>-0.39</td>
</tr>
<tr>
<td>BF burdens on mother</td>
<td>-0.17</td>
<td>1.00</td>
<td>0.21</td>
<td>-0.21</td>
</tr>
<tr>
<td>BM is easily compromised</td>
<td>0.14</td>
<td>0.21</td>
<td>1.00</td>
<td>-0.19</td>
</tr>
<tr>
<td>Positive attitude toward BF</td>
<td>-0.39</td>
<td>-0.21</td>
<td>-0.19</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Factor scores were generated for each of the four factors. These scores were used in lieu of individual questionnaire items in subsequent analysis.
3.9 Identification of variables for inclusion in a multiple regression analysis

3.9.1 Demographics

In order to determine the proportion of variance in attitudes that could be attributed to demographic characteristics (gender, age, educational attainment, marital status, income and number of children), a standard multiple regression analysis (MRA) was performed using factor scores as the criterion variables.

Prior to interpreting the results, relevant assumptions were evaluated. First, inspection of the normal probability plot of standardised residuals and the scatterplot of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met. Second, although maximum Mahalanobis distances exceeded the critical $\chi^2$ value for $\text{df}=6$ ($\alpha=0.001$) of 22.46 (indicating the presence of multivariate outliers), maximum Cook’s D was small indicating that the influence of the outliers was not significant. Third, high tolerances for all predictors in the model indicated that multicollinearity would not interfere with interpretation of the analyses.

In combination, gender, age, educational attainment, marital status, income and number of children accounted for 5% of the variance in attitude towards formula feeding (factor one score), $R^2=0.049$, adjusted $R^2=0.032$. $F(6,339)=2.930$, $p=0.008$. Unstandardised ($B$) and standardised ($\beta$) regression co-efficients, and squared semi-partial (or ‘part’) correlations ($sr^2$) for each predictor in these regression models are reported in Table 6.10. Demographic factors did not account for significant proportions of the variance in either of the other three factor scores.

Table 6.10 – Unstandardised ($B$) and standardised ($\beta$) regression co-efficients, and squared semi-partial (or ‘part’) correlations ($sr^2$) between demographic variables and attitude towards formula feeding.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$sr^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-0.285</td>
<td>-0.103</td>
<td>0.010</td>
</tr>
</tbody>
</table>
One-way ANOVA was used to further investigate the relationship between educational attainment and attitude towards formula feeding. The assumption of normal distribution was upheld for each of the five conditions (yr10 or lower, TAFE or Trade, undergraduate degree, postgraduate degree or diploma); measures of skewness and kurtosis fell between 1 and -1 and Shapiro-Wilk statistics were not significant. Levene’s statistic was not significant, $F(4,361) = 0.283$, $p = 0.889$, indicating that the assumption of homogeneity of variances was not violated.

The analysis indicated a significant difference existed between the groups, $F(4,361) = 4.233$, $p = 0.002$. Post-hoc analyses using Tukey’s Honestly Significant Difference test ($\alpha = 0.05$) revealed higher mean factor scores (indicating more positive attitudes to formula feeding) amongst those whose highest attainment was secondary school completion ($M = 0.236$, $SD = 0.950$) than amongst those whose highest attainment was an undergraduate degree ($-0.191$, $SD = 0.873$); there were no other significant differences.

This suggested that having completed a university qualification might affect attitude towards formula feeding. In order to test this hypothesis, the education variable was recoded into a binary variable indicating whether the respondent held undergraduate/postgraduate qualifications or not and the ANOVA repeated. Assumptions were tested as described above and no violations were found. The analysis revealed that the group without university qualifications had higher mean 137
factor scores ($M = 0.201$, $SD = 0.932$) indicating more positive attitudes towards formula feeding than those with university qualifications ($M = -0.183$, $SD = 0.880$), $F(1,361) = 16.411$, $p = 0.000$. This variable was therefore selected for inclusion in the final regression model.

3.9.2 Perceived peer norms

Because perceived peer norm variables were categorical, three one-way ANOVAs were performed to determine whether perception of the usual duration of exclusive breastfeeding, usual duration of any breastfeeding, or usual age at which formula is introduced were related to attitude towards formula feeding. Assumptions were tested as described above. Only the distribution of scores amongst those who believed that it was usual for their peers to breastfeed for more than 18 months violated the normality assumption. As there were only seven respondents who fell into this category, the variable was recoded and these responses were combined with those who believed it was usual for their peers to breastfeed for 12 -17 months and relabelled BF>12mos. The analysis was repeated and although the Shapiro-Wilkes statistic indicated a departure from normality, the skew and kurtosis values fell between 1 and -1. Thus it was judged appropriate to continue with ANOVA.

The first analysis indicated perceived usual duration of exclusive breastfeeding amongst one’s peers was related to a significant difference in factor score, $F(3,372) = 5.141$, $p = 0.002$. Post-hoc analyses using Tukey’s Honestly Significant Difference test ($\alpha = 0.05$) revealed lower mean factor scores (indicating more positive attitudes to formula feeding) amongst those who believed that most of their peers fed no formula prior to introducing solids ($M = -0.399$, $SD = 0.929$) than those who believed that most of their peers combined breast and formula feeding ($M = 0.025$, $SD = .931$),
those who believed that most of their friends only fed their babies formula (M = 0.221, SD = 0.899) and those who did not know (M = 0.155, SD = 0.844).

The second analysis indicated that perceived usual age at introduction of formula was also related to a significant difference in factor score, $F(4,371) = 2.530, p = 0.040$. Post hoc analyses using Tukey’s Honestly Significant Difference test ($\alpha = 0.05$) revealed higher mean factor scores (indicating more positive attitudes to formula feeding) amongst those who believed that most of their peers start using formula before their babies reach six months of age (M = 0.153, SD = 0.915) and those who believed that most of their peers never use formula (M = -0.351, SD = 0.838). There were no other significant differences.

The third analysis revealed that perceived usual duration of any breastfeeding was not significantly related to differences in positive attitude towards formula feeding.

The result of these analyses suggested that the perception that one’s peers usually introduce formula prior to six months might affect attitude towards formula feeding. In order to test this hypothesis, the usual age at introduction of infant formula variable was recoded into a binary variable indicating whether the respondent believed that it was usual for his/her peers to introduce formula prior to six months and the ANOVA repeated. Assumptions were tested as described above. Although the Shapiro-Wilk statistic was significant for the no group, skewness and kurtosis values lay between 1 and -1, indicating only a slight departure from normality. Since ANOVA is known to be robust to such deviations it was considered appropriate (Murphy 1999).

The analysis revealed that the ‘yes’ group had higher mean factor scores (M = 0.153, SD = 0.915) indicating more positive attitudes towards formula feeding than the no
group (M = -0.098, SD = 0.926), \( F(1,374) = 6.736, p = 0.010 \). This variable was therefore selected for inclusion in the final regression model.

3.9.3 Previous feeding experience

Previous feeding experience is likely to influence attitudes around breastfeeding and/or formula feeding. Research has found that behaving in ways that are inconsistent with one’s knowledge or beliefs produces a psychological discomfort called, *Cognitive Dissonance* and that this discomfort ‘…will motivate the person to try to reduce the dissonance and achieve consonance’. Furthermore, he found that ‘…in addition to trying to reduce [dissonance], the person will actively avoid situations and information which would likely increase the dissonance’ (Festinger 1957, p3). In the case of infant feeding, we would therefore expect mothers who have used formula to seek information that minimises the importance of breastfeeding and/or to avoid or dismiss information associating health risks with formula feeding.

A one-way ANOVA was used to determine whether there was a relationship between previous infant feeding behaviours and attitude to formula feeding. Assumptions were tested as described above and no violations were found.

The analysis revealed that those who had fed their first child formula before six months had higher mean factor scores (M = 0.395, SD = 0.810), indicating more positive attitude towards formula feeding than those who had not (M = 0.143, SD = 0.949), \( F(1,239) = 4.339, p = 0.038 \). Consequently, this variable was included in the analysis.

3.9.4 Acceptance of infant feeding recommendations

In order to estimate the proportion of variance in attitude to formula feeding that could be accounted for by acceptance of recommended duration of exclusive
breastfeeding and acceptance of recommended duration of breastfeeding, a standard multiple regression analysis was performed with these variables as predictors.

Prior to interpreting the results of the MRA, the relevant assumptions were evaluated. First, inspection of the normal probability plot of standardised residuals as well as the scatterplot of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met. Second, maximum Mahalanobis distance did not exceed the critical \( \chi^2 \) value for \( df=2 \) (\( \alpha=0.001 \)) of 13.82, indicating that multivariate outliers were not of concern. Third, high tolerances for both predictors in the regression model indicated that multicollinearity would not interfere with interpretation of the analysis.

In combination, variables addressing the acceptance of recommended infant feeding practices accounted for 4.0% of the variance in attitude towards formula feeding, \( R^2 = 0.040 \), adjusted \( R^2 = 0.035 \). \( F (2,360) = 7.596, p = 0.001 \). Only acceptance of duration of any breastfeeding accounted for significant unique variance, \( B = -0.133, \beta = 0.201, sr^2 = 0.040 \). Therefore this variable was selected for use as a predictor in the final model.

### 3.9.5 Advertising exposure and recall

In order to determine the proportion of variance in factor scores that could be attributed to recollection of exposure to advertising (number of products seen advertised, retail or non-retail advertising, number of sources of advertising, type of formula advertising seen, number of advertising messages recalled), a series of four standard multiple regression analyses (MRA) were performed; one using each of the four factor scores as the criterion.
Prior to interpreting the results, relevant assumptions were evaluated. First, inspection of the normal probability plots of standardised residuals as well as the scatterplots of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met for each of the four analyses. Second, although maximum Mahalanobis distance exceeded the critical $\chi^2$ value for df=8 ($\alpha=0.001$) of 26.12 (indicating the presence of multivariate outliers), maximum Cook’s D was small indicating that the influence of the outliers was not significant. Third, high tolerances for all predictors in the model indicated that multicollinearity would not interfere with interpretation of the analysis.

In combination, having seen retail advertising, having seen non-retail advertising, number of sources of advertising, type of formula seen advertised and number of advertising messages recalled accounted for 4.4% of the variance in attitude towards formula feeding, $R^2 =0.044$, adjusted $R^2 = 0.024$, $F (7,335) = 2.224$, $p = 0.032$. Unstandardised ($B$) and standardised ($\beta$) regression coefficients, and squared semi-partial (or ‘part’) correlations ($sr^2$) for each predictor in these regression models are reported in Table 6.11. Only those predictors that accounted for a significant proportion of the variance ($\alpha = 0.10$) in attitude towards formula feeding (perceived exposure to infant formula advertising, having seen non-retail formula advertising and having seen retail formula advertising) were included in the final analysis. Recollection of advertising exposure did not account for significant proportions of the variance in any of the other three factor scores and so no further analyses were undertaken for these criterion variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$sr^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>What types of formula have you seen advertised?</td>
<td>0.194*</td>
<td>0.098</td>
<td>0.007</td>
</tr>
<tr>
<td>(infant)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. 10 Multiple regression analysis

In order to estimate the proportion of variance in attitude towards formula feeding that can be accounted for by having seen a retail formula advertisement, having seen a non-retail formula advertisement, perception of having seen an infant formula advertisement and the number of infant formula products seen advertised after controlling for university qualification, perception of peer infant feeding norms, acceptance infant feeding recommendation and previous infant feeding experience, standard multiple regression was employed.

Prior to interpreting the results of the MRA, the relevant assumptions were evaluated. First, inspection of the normal probability plot of standardised residuals as well as the scatterplot of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met. Second, maximum Mahalanobis distance not exceed the critical $\chi^2$ value for $df=8(\alpha=0.001)$ of 26.12, indicating that multivariate outliers were not of concern. Third, high tolerances for all predictors in the regression model indicated that multicollinearity would not interfere with interpretation of the analysis.

In combination, the eight variables accounted for 17% of the variance in attitude towards formula feeding, $R^2 = 0.168$, adjusted $R^2= 0.141$, $F (7,214) = 6.188$, $p = 0.000$. Unstandardised ($B$) and standardised ($\beta$) regression coefficients, and squared...
semi-partial (or ‘part’) correlations ($sr^2$) for each predictor are reported in Table 6.12. After controlling for all of the other variables, only university education and acceptance of recommendations accounted for significant variance in attitude towards formula feeding. None of the advertising variables accounted for significant variance beyond that accounted for by all of the other variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$sr^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accept duration of bf recommendation?</td>
<td>-0.393**</td>
<td>-0.218</td>
<td>0.045</td>
</tr>
<tr>
<td>University qualification?</td>
<td>-0.432**</td>
<td>0.235</td>
<td>0.052</td>
</tr>
<tr>
<td>Most of my friends who are mothers introduce formula before 6 months</td>
<td>0.203</td>
<td>0.112</td>
<td>0.011</td>
</tr>
<tr>
<td>First child fed formula before 6 months</td>
<td>-0.134</td>
<td>-0.071</td>
<td>0.005</td>
</tr>
<tr>
<td>Have seen infant formula advertised?</td>
<td>0.128</td>
<td>0.066</td>
<td>0.004</td>
</tr>
<tr>
<td>Have seen a non-retail formula ad?</td>
<td>0.003</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td>Have seen a retail formula ad?</td>
<td>0.022</td>
<td>0.012</td>
<td>0.000</td>
</tr>
</tbody>
</table>

**p<0.01

3.10.1 Sub-group analysis

In order to estimate the proportion of variance in attitudes towards formula feeding amongst those who were not university educated that could be accounted for by these same variables, the analysis was repeated including only those cases who indicated that they did not hold undergraduate or postgraduate qualifications.

First, one-way ANOVAs were used to determine whether peer norms, previous infant feeding experience or acceptance of the recommendations were significantly related to attitude towards formula feeding amongst this subgroup. The distribution of the attitude scores (dependent variable) was tested as described above and found to approximate normality. Levene’s test indicated that the peer norm variable and the acceptance of recommendations variable met the assumption of homoscedasticity but that the previous infant feeding experience variable did not.
The analysis revealed that those who believed that babies should not breastfeed beyond 12 months had higher mean factor scores (M = 0.378, SD = 0.890), indicating more positive attitude towards formula feeding, than those who believed that babies should continue breastfeeding beyond 12 months (M = - 0.017, SD = 0.941), $F(1,165) = 7.726, p = 0.006)$. No difference was detected between those whose believed that their peers usually introduced formula before six months and those who did not ($F(1,164) = 2.561, p = 0.111$).

Second, a standard multiple regression analysis was performed using awareness and acceptance of recommendations on duration of breastfeeding, having seen a non-retail formula advertisement, having seen a retail infant formula advertisement and having seen an infant formula advertisement as predictors and attitude towards formula feeding (factor one score) as the criterion.

Prior to interpreting the results of the MRA, the relevant assumptions were evaluated. Inspection of the normal probability plot of standardised residuals as well as the scatterplot of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met. While the maximum Mahalanobis distance exceeded the critical $\chi^2$ value for $df=4(\alpha=0.001)$ of 18.47, maximum Cook’s distance was small indicating that multivariate outliers were not of concern. Third, high tolerances for all predictors in the regression model indicated that multicollinearity would not interfere with interpretation of the analysis.

In combination the four variables accounted for 11% of the variance in attitude towards formula feeding amongst those who did not hold undergraduate or postgraduate qualifications. $R^2 = 0.107$, adjusted $R^2= 0.084$, $F (5,154) = 4.627, p =$
0.001. Unstandardised \((B)\) and standardised \((\beta)\) regression coefficients, and squared semi-partial (or ‘part’) correlations \((sr^2)\) for each predictor are reported in Table 6.13. After controlling for all of the other variables, both awareness and acceptance of recommendations and having seen a non-retail formula advertisement accounted for significant variance in attitude towards formula feeding, beyond that accounted for by all of the other predictors.

Table 6.13 – Unstandardised \((B)\) and standardised \((\beta)\) regression coefficients, and squared semi partial correlations \((sr^2)\) for a multiple regression predicting attitudes towards formula feeding amongst respondents who were not university educated

<table>
<thead>
<tr>
<th>Variable</th>
<th>(B)</th>
<th>(\beta)</th>
<th>(sr^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware/accept duration of bf recommendation?</td>
<td>-0.442*</td>
<td>-0.237</td>
<td>0.050</td>
</tr>
<tr>
<td>Have seen infant formula advertised?</td>
<td>0.138</td>
<td>0.067</td>
<td>0.004</td>
</tr>
<tr>
<td>Have seen a non-retail formula ad?</td>
<td>0.779*</td>
<td>0.228</td>
<td>0.042</td>
</tr>
<tr>
<td>Have seen a retail formula ad?</td>
<td>0.057</td>
<td>0.147</td>
<td>0.000</td>
</tr>
</tbody>
</table>

\(p<0.01\)

Amongst respondents in this subgroup, having seen a non retail formula advertisement (a toddler milk advertisement) accounted for 4.2% of the variance in attitude towards formula feeding that was not accounted for by any of the other predictors.

4 **SUMMARY AND OBSERVATIONS**

Exploratory factor analysis revealed that infant feeding attitudes are multi-faceted and that the dimensions of these attitudes are not strongly correlated with one another. Attitude towards formula feeding was only weakly correlated with attitude towards breastfeeding. Further analysis revealed that attitude towards formula feeding was influenced by self-reported exposure to formula advertising but attitude towards breastfeeding was not. This relationship persisted after controlling for acceptance of the recommended duration of breastfeeding amongst respondents who did not hold
university qualifications, a group that tends to cease exclusive breastfeeding early and have shorter breastfeeding duration (Donath and Amir 2000).

There is considerable confusion amongst parents about the importance of breastfeeding and the ramifications of formula feeding. Understanding that the use of formula milks carries risk does not appear to be widespread. Many respondents seemed to believe both that breastfeeding is best for babies and that formula feeding is without risk. This result is similar to that of the American HealthStyles Survey which found that approximately half of those who thought breastfed babies are healthier than formula fed babies did not believe that feeding a baby formula instead of breastmilk increases the chances that the baby will get sick (Hannan, Li et al. 2005). Although this result might be attributed to the phenomenon described as Cognitive Dissonance (Festinger 1957), it was also observed amongst parents expecting a first baby; 20% of those who agreed with the statement, ‘Breastfed babies are healthier than formula fed babies’ also agreed with the statement ‘Formula fed babies are just as healthy as breastfed babies’ and 40% gave neutral responses. This suggests that the confusion may be attributable to the reluctance of researchers, health promoters, and health professionals to communicate the risks associated with formula feeding (Berry and Gribble 2008; Smith, Dunstone et al. 2009; Stuebe 2009).

There is also considerable confusion around how mothers’ lifestyle choices influence the quality of their milk. The responses seem to suggest a belief that the differences between mothers’ milk and infant formula are so small that even minor changes in the composition of mothers’ milk might render it a less healthy choice than commercial infant formula and this would be consistent with an American study which found that women viewed ‘breastfeeding … [as] like supplementing a “standard diet” with vitamins’ (National Women's Health Information Center 2004).
The contradictory notion that breastfed babies are healthier but formula fed babies are just as healthy was reflected in the infant feeding practices reported by the respondents. Nearly all respondents reported that their babies had been breastfed but fewer than one in four had completely avoided infant formula. This result is consistent with other Australian data describing infant feeding patterns which suggest that exclusive breastfed for six months is not practiced by Australian mothers (Australian Bureau of Statistics 2003; Scott, Binns et al. 2006b).

While Australian health authorities have been recommending that infants be breastfed for a year or more, and that babies should be fed nothing but human milk for the first six months since 2003 (NHMRC 2003), the message does not appear to be reaching mothers and if it is, it is not well accepted. Fewer than three in five respondents believed that infants should be fed nothing but human milk for the first six months and a large proportion believed that breastfeeding should cease at or before 12 months of age. It is of particular interest that 31.5% indicated that breastfeeding should cease at 12 months. This could indicate that the NHMRC recommendation ‘that breastfeeding continue until 12 months of age and thereafter as long as mutually desired’ has been understood by some as a recommendation that breastfeeding cease at 12 months.

The marked difference in acceptable duration of breast and bottle feeding seems to suggest a view that breastfeeding is something that mothers should not do for too long. In this view, bottle feeding is therefore an inevitable part of infant and young child feeding. This is consistent with the strong body of qualitative research and feminist analysis that has identified a fear of social sanction associated with breastfeeding too often, too publicly or for too long (Carter 1995; Murphy 1999; Shaw 2004; Stearns 1999). In this context, bottle feeding acquires an aura of
‘normal’ (Cricco-Lizza 2004). There is also research demonstrating that mothers in Australia and overseas encounter social pressure to discontinue breastfeeding well before the recommended minimum duration has been reached (Gribble 2008; Hauck and Irurita 2003; Hauck and Irurita 2002; Morse and Harrison 1987; Wrigley and Hutchinson 1990). Many mothers view breastfeeding as a liminal or temporary state, ‘a transitional period, before their return to a perceived normal bodily state’ (Mahon-Daly and Andrews 2002, p65; also Dykes 2005; Lee 2007) and express a desire to ‘regain control over their lives, over their bodies’ (Crossley 2009; Dykes 2005; Schmied and Lupton 2001, p245; Stewart-Knox, Gardiner et al. 2003). Breastfeeding mothers have reported feeling compelled to withdraw from social situations and economic activities in order to feed their babies whereas bottle feeding mothers do not; one bottle feeding mother said, “I can feed him anywhere and so can anyone else” (Mahon-Daly and Andrews 2002, p70; also Lee 2007). It appears that amongst respondents to this survey, the period during which breastfeeding is acceptable is so short that most parents view bottle (formula) feeding as unavoidable. Confirmation was provided by the responses to the statement ‘most mothers have to feed their babies some formula’; only 44.2% of respondents disagreed.

It is not surprising then that exclusive breastfeeding for six months and the avoidance of infant formula was not considered to be usual practice amongst the respondents’ peers. While this is a fair reflection of infant feeding practices documented in the National Health Survey, it also indicates that mothers are likely to be learning poor infant feeding practices from their peers (Bailey, Pain et al. 2004; Miracle, Meier et al. 2004) and unlikely to experience the kind of apprenticeship in breastfeeding that has been reported to be influential in the continuation of breastfeeding (Bottorff 1990; Hoddinott and Pill 1999; Locklin 1995).
Exposure to advertising for formula products approached universality amongst respondents. Most respondents had seen advertisements that did not originate from a retailer. Since there have been no breaches of the MAIF Agreement reported since 2002/3 (Advisory Panel on the Marketing in Australia of Infant Formula 2004, 2005, 2008), these advertisements were almost certainly advertisements for toddler milk and were certainly not advertisements for infant formula. Even so, 67% of those who had only seen non-retail advertisements reported that they believed they had seen an advertisement for infant formula. This result is consistent with the results of British research which found around 60% of mothers and expectant mothers thought follow-on formula advertising was promoting infant formula (National Childbirth Trust/Unicef UK 2005; NOP World for Department of Health 2005) and is a clear indication that advertisements for formula milk products other than infant formula are widely understood to be advertising infant formula.

This conclusion is supported by the observation that almost all of the respondents who reported having seen formula advertised reported that they had seen an advertisement for at least one of five infant formula products depicted on the survey even though fewer than half reported having seen an advertisement that could have been an infant formula advertisement. Respondents who had seen only advertisements which could not have depicted infant formula were actually more than twice as likely to believe that they had seen infant formula advertised than those who had only seen retail advertisements which could have depicted infant formula. Furthermore, a large proportion of respondents recognised advertising messages as messages they had seen in formula advertising. Since retail advertisements can only contain pack shots and price information these messages must have been gleaned from toddler milk or formula brand advertisements.
The nature of the advertising messages recognised by respondents demonstrated the potential this advertising has to undermine breastfeeding promotion. More than a quarter (28.4%) of respondents believed that infant formula is as good as breastmilk and this proportion is very close to the proportion of respondents (27.1%) who reported having seen formula advertising claiming that the product ‘is like breastmilk’. One in four respondents reported having seen formula advertising claiming that formula ‘strengthens immunity’ and one in three a formula advertisement claiming that formula ‘improves brain development’.

In order to counteract advertising messages, mothers need alternative sources of information. The next stage of this project was exploratory in nature. It utilised established qualitative market research strategies to investigate: what is known about infant formula by those who influence mothers; what sources of information about infant formula these people draw upon when talking to mothers about infant formula; and how they assess claims made in toddler milk advertisements.
Chapter Seven

Study Four: “Relax! You’re soaking in it.”

This chapter describes the conduct, analysis and results of the last of four studies that constitute this project. The results of all four studies will be synthesised at the level of interpretation in Chapter Eight. This study utilised a series of discussion group interviews to explore what mothers and those who influence mothers know about infant formula and what sources of information about infant formula they use.

1 INTRODUCTION

In order to evaluate advertising messages mothers need alternative, accurate sources of information. The study described in this chapter utilised established qualitative market research strategies to investigate what is known about infant formula by mothers and those who influence mothers. This included exploration of commonly used sources of information; how toddler milk advertisements are interpreted; and how the claims made in these advertisements are evaluated. This exploratory study was designed to identify issues that warrant further research.

In total, eight discussion groups of varying sizes were convened to explore participants’ brand awareness and sources of information about formula milk products in addition to exploring their responses to print advertisements for toddler milk.

2 MATERIALS AND METHODS

2.1 Instrument development

A discussion protocol was developed (Figure 7.1). The protocol was informed by the results of earlier studies which suggested that mothers source information about feeding their infants from health professionals, other mothers and from advertising
Bentley, Caulfield et al. 1999; Cantrill, Creedy et al. 2003; Chezem, Friesen et al. 1998; Gildea, Sloan et al. 2009; Heinig, Ishii et al. 2009). The protocol was designed to explore the sources of information used by respondents and to determine whether respondents repeat advertising messages in their conversations about infant feeding and infant formula. In addition the protocol was designed to examine respondents’ strategies for evaluating advertising claims.

Figure 7.1 – Discussion Protocol

<table>
<thead>
<tr>
<th>Discussion Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. MOTHERS’ BRAND AWARENESS &amp; ATTITUDE</strong></td>
</tr>
<tr>
<td>I am interested in what mothers know about infant formula.</td>
</tr>
<tr>
<td>1.1 Where do mothers get their information about infant formula?</td>
</tr>
<tr>
<td>1.2 Could you tell me what the mothers you work with know about infant formula? What do they tell you about formula?</td>
</tr>
<tr>
<td>1.3 Could you tell me what brand or brands the mothers you work with prefer? Do they tell you why they prefer that brand?</td>
</tr>
<tr>
<td><strong>2. OWN BRAND AWARENESS</strong></td>
</tr>
<tr>
<td>2.1 What brands of infant formula are you aware of?</td>
</tr>
<tr>
<td>2.2 How do you find out about the different brands? How do your colleagues/friends find out about the different brands?</td>
</tr>
<tr>
<td>2.3 What do you know about them?</td>
</tr>
<tr>
<td>2.4 What do you tell (other) mothers who ask you which formula to use? How do they respond?</td>
</tr>
<tr>
<td>2.5 What do your colleagues (other people) tell mothers who ask about which brand of formula to use?</td>
</tr>
<tr>
<td><strong>3. STIMULUS</strong></td>
</tr>
<tr>
<td>Show each advertisement individually:</td>
</tr>
<tr>
<td>3.1 What product is it advertising? (on paper) all these ads have something in common, can you see what it is?</td>
</tr>
<tr>
<td>3.2 Have you seen any of these ads before?</td>
</tr>
<tr>
<td>3.3 On your paper could you rank them from the one that you think would be most appealing to the one that you think would be least appealing? (discuss why)</td>
</tr>
<tr>
<td>3.4 If this brand could speak, what would it say to mothers? (Pick the top three)</td>
</tr>
<tr>
<td><strong>ALTERNATIVES</strong></td>
</tr>
<tr>
<td>Can you describe what kind of mother would use this brand?</td>
</tr>
<tr>
<td>What else would this mother buy for her baby?</td>
</tr>
<tr>
<td>If this brand was a person who would it be?</td>
</tr>
<tr>
<td>Which of these brands would you choose as your friend?</td>
</tr>
<tr>
<td>3.5 What do you think of these brands?</td>
</tr>
</tbody>
</table>

Expert validation of the protocol was provided by the project supervisor (SJ) who has considerable expertise in the area of marketing and by consultation with another
researcher who has published qualitative research in the area of infant and young child feeding and who had no other involvement with the project.

Print advertisements for toddler milks collected for Studies One and Two, (Chapters Four and Five) were used as stimulus material in this study and are illustrated in Appendix Two.

2.2 Recruitment
In order to recruit ‘information-rich cases’, a purposive or deliberate sampling strategy was utilised because it enabled the selection of participants from specific populations (Liamputtong and Ezzy 2005). Although not assumed to be a representative sample, participants recruited in this way are selected on the criteria that they are expected to have something to say on the topic of interest (Rabiee 2004). One group of Child and Family Health Nurses (CFHNs) was recruited from each of two Area Health Services in NSW (two groups in total) with the permission of the Nursing Unit Managers. One of these was a remote area and one was a regional area. In addition one Registered Dietician was recruited from the remote Area Health Service and one General Practitioner was recruited from the regional area. Two groups of mothers/expectant mothers and two groups of grandmothers/potential grandmothers were recruited from a congregation of the Newcastle Diocese of the Anglican Church in Australia with permission from the relevant Archdeacon.

Approval for the study was granted by the University of Wollongong Human Research Ethics Committee, NSW Health and the Anglican Diocese of Newcastle.

2.3 Data collection
Discussion fora were held at the workplaces of health professionals and on the premises of the Anglican Church in Australia between April and October 2009. Following completion of a formal consent procedure and time spent building
rapport, respondents were asked a series of questions about what they and the mothers with whom they were acquainted knew about infant formula, including brand awareness and sources of information. The questions were modified slightly as appropriate for each group. Respondents were then shown a series of advertisements for toddler milk products and asked a series of questions about the advertisements and their responses to the advertisements. Conversations were allowed to range freely so as to explore, as comprehensively as possible, the participants’ thoughts, ideas and beliefs about infant formula.

In order to facilitate a thorough exploration of the participants’ knowledge, attitudes and beliefs about infant feeding and toddler milk advertisements, open questioning, reflective questioning, clarification, repetition of ideas that appeared from the participants’ tone or body language to be significant to them, and summarising of participants’ responses were used.

In order to identify any influence the interviewer might have exerted on the responses given, recordings and transcripts of the interviews were examined by the project supervisors. Detailed field notes were also kept to enable the interviewer to reflect upon her role in the interview process, and to ensure that she had retained the role of neutral observer for the duration of each interview (Liampittong and Ezzy 2005).

2.4 Data analysis
Data collection and analysis were conducted simultaneously with recruitment continuing until saturation had been reached for each of the themes. Transcription of the recordings of the discussions was performed by the student within 48 hours of the discussions in order to facilitate detailed analysis through immersion in the data. A thematic approach, known as ‘framework analysis’, was used to derive patterns from the participants’ responses (Krueger 1994; Ritchie and Spencer 1994). Framework
analysis allows themes to develop both from the research questions and from the responses. Because the coding frame was not especially complex, transcripts were coded by hand (Glaser 1992; Liamputtong and Ezzy 2005).

2.5 Validity
A number of steps were taken to validate the analysis. Transcripts were examined independently by two researchers, the student and a researcher with expertise in qualitative research on infant feeding who was not otherwise involved in the project, in order to identify recurrent themes. From these themes a coding frame was developed and the entire sample coded independently by both researchers. Disagreements were then discussed and resolution was by consensus. Responses that were inconsistent with emerging patterns were sought and reported where they occurred. The collection of data from three different groups of women (health professionals, mothers and grandmothers) provided a source of comparison and triangulation. Verbatim quotations, reported using pseudonyms, are used to illustrate patterns in the participants’ responses and, as is the custom with qualitative research, the results are presented simultaneously with observations from the literature (Liamputtong and Ezzy 2005).

3 RESULTS AND OBSERVATIONS

3.1 Discussion fora
In total, eight discussion fora were conducted, involving a total of seventeen women. One group consisted of five Child and Family Health Nurses. One group consisted of two Child and Family Health Nurses. The Registered Dietician and General Practitioner expressed preferences for individual interviews and this preference was accommodated. Experience with Child and Family Health Nurses revealed that conversation was more candid in the smaller group, possibly because the interaction
between friends engendered a more supportive dynamic. Given this observation the remaining groups consisted of two friendship groups of two mothers and two friendship groups of two grandmothers.

3.2 Sources of information
All of the participants agreed that health professionals are an important source of information about infant formula for mothers. Health professionals also looked to other health professionals, such as General Practitioners (GPs), specialist doctors, allied health care providers and professional associations, for information when selecting or recommending an infant formula. Responses indicating that health professionals are a common source of information about infant formula are reported in Table 7.1.

The influence of health care providers on mothers’ choice of formula milk brands seemed to reach beyond their explicit advice. A number of respondents said that they or mothers they knew chose their infant formula based on the brand they had seen used in maternity hospitals. For example, Viola (CFHN) said that the mothers she advised chose ‘what they used at the hospital’ and Vashti (mother) also observed that a mother she knew ‘was given something in the hospital and decided to go with that’. These responses suggest that the use of a brand of infant formula in a hospital is viewed as an endorsement by some mothers.
Many respondents also reported that babies’ grandmothers and other mothers are a common source of information about infant formula (Table 7.2). These findings are consistent with research conducted in Northern Ireland indicating that primary health care providers (Health Visitors) and grandparents were the most commonly cited sources of information about infant feeding (Liamputtong and Ezzy 2005). Interestingly, similar research conducted amongst American women of low socio-economic status found that these mothers relied more heavily on experienced family members and friends than on health care professionals for infant feeding advice (Gildea, Sloan et al. 2009).
Chemist (pharmacy) assistants emerged as another human source of information about infant formula possibly because many mothers purchase infant formula from pharmacies. Vonne (CFHN) commented that ‘chemists often give advice about which is best; assistants in the chemists, like they'll say one is better than the other’; a comment that met with general agreement in the group. Vrinda and Venetta (grandmothers) also suggested that mothers might find information about infant formula in pharmacies.

Although the MAIF Agreement has been in place for close to two decades, health professionals, mothers and grandmothers who participated in the study cited advertising as an important source of information about infant formula (Table 7.3). Some respondents demonstrated that they or mothers they knew had heard and remembered advertising messages which they associated with infant formula.

The most readily recalled advertising messages were those centred on the ‘gold’ formulas. Both groups of CFHNS reported that mothers express a strong preference for ‘gold’ formulas and it appears to be important to them that their CFHNS know that...
they are using a ‘gold’ formula\(^1\). Enthusiastic agreement from every member of the group followed Violet’s (CFHN) declaration ‘they love the Gold and they love saying “gold”’ and in the other group of CFHNs, Vanessa commented that, ‘those who want to do the best for their children, if they’re not breastfeeding, they use the S26 Gold or the HA or whatever it sounds or whatever they say they’ve put into it, yeah the more they put in, the better I guess’; Vera (grandmother) also mentioned that her own daughter, ‘uses that gold stuff’. CFHNs were generally skeptical about the use of these ‘gold’ infant formulas and some were aware that there is insufficient evidence to support the addition of these ingredients in formula milks, especially given the price premium they attract. Viola (CFHN) noted that some mothers who begin using a ‘gold’ formula because they believe it to be superior to standard formulas find it is prohibitively expensive and switch to a standard formula milk, saying ‘but sometimes those ones change to a cheaper one as they go along’.

Table 7.3: Sources of information about infant formula – advertising

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>and TV recently because we’ve had a lot of comments about the toddler formulas which is starting on advertising after 12 months - so a lot of mums have seen that and they ask you about that.</td>
<td>CFHN</td>
</tr>
<tr>
<td>Valerie</td>
<td>We get updated by the companies</td>
<td>CFHN</td>
</tr>
<tr>
<td>Veronica</td>
<td>I think a lot of it comes from word of mouth and advertising. It depends what they’re reading and seeing.</td>
<td>RD</td>
</tr>
<tr>
<td>Vashti</td>
<td>Some are more heavily advertised on TV so you see the brand and think, oh yeah well that must be OK because they’re advertised a lot.</td>
<td>Mother</td>
</tr>
<tr>
<td>Vespa</td>
<td>Karicare. That’s the one that’s on TV, I think isn’t it. That’s the only one I’ve heard of too because of TV</td>
<td>Mother</td>
</tr>
<tr>
<td>Vee</td>
<td>This one because I got sent a sample in the mail</td>
<td>Mother</td>
</tr>
<tr>
<td>Verity</td>
<td>all the different ah brochures and pamphlets that were kicking around</td>
<td>Grandmothers</td>
</tr>
<tr>
<td>Venetta</td>
<td>Ah, partly it would be from advertising</td>
<td>Grandmothers</td>
</tr>
</tbody>
</table>

The Community Dietician (CD) and some of the CFHNs reported that sales staff from infant formula manufacturing companies provided them with information about

\(^1\) ‘Gold’ generally denotes a formula milk product which meets Food Standard 2.9.1 and has ‘optional ingredients’ added. These might include long chain polyunsaturated fatty acids such as DHA or ARA, and/or probiotics or oligosaccharides (prebiotics). The ‘Gold’ moniker is used by all of the formula milk brands.
formula milk products. Valerie said, ‘We get updated by the companies. … They send stuff out every now and again.’ And when asked how she chooses a formula for her patients, Veronica (CD) pulled out promotional leaflet supplied by Nutricia and said, ‘for example, Nutricia, they’ll send out their promotional stuff.’ This suggests that some health professionals continue to regard sales staff as credible information sources. This is in spite of the NSW Health Policy Directive2006_12, which enjoins Area Health Services to ‘comply with responsibilities under the International Code of Marketing of Breastmilk Substitutes and the Marketing in Australia of Infant Formulas: Manufacturers and Importers (MAIF) Agreement’, which has been interpreted as prohibiting contact between clinical staff and infant formula sales representatives in most NSW Area Health Services including those sampled (Mate, J. 2010 Personal Communication). It may be that some NSW Health personnel continue to see sales staff or it may be that the influence of past visits persists. The latter possibility seems likely if there has been no independent information provided to them about infant formula.

The information supplied on the packaging of formula milk products was clearly not regarded either by health professionals or by mothers as advertising; on the contrary a number of respondents talked about using this information as a way to verify advertising claims (Table 7.4). Veronica also thought that the advertisers’ websites could be used to verify advertising claims.
Table 7.4 Packaging not regarded as advertising

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veronica</td>
<td>you’d have to read that can to know [if the advertising claim was true]</td>
<td>RD</td>
</tr>
<tr>
<td></td>
<td>I guess on the tin it’s going to explain the immune system boosters</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It tells you to go to the website, which I am sure has got more [information]</td>
<td></td>
</tr>
<tr>
<td>Viola</td>
<td>What’s on the back of the tin … you compare that</td>
<td>CFHN</td>
</tr>
<tr>
<td>Vanessa</td>
<td>Plus in the supermarket yourself you do actually stop and look and compare labels every now and then.</td>
<td>CFHN</td>
</tr>
<tr>
<td>Vespa</td>
<td>I imagine that you’d want to, you might gain information just from that; just from buying it and reading it</td>
<td>mother</td>
</tr>
<tr>
<td>Vrinda</td>
<td>Just read it on the cans</td>
<td>grandmother</td>
</tr>
<tr>
<td>Vera</td>
<td>You can get so confused you don’t know what you’re getting – so it must be the carton; what’s on the can, maybe that’s the way they –</td>
<td>grandmother</td>
</tr>
</tbody>
</table>

It is difficult to imagine how information included on infant formula packaging could help mothers to evaluate advertising claims, given that it is written by advertisers and may be difficult even for educated professionals to decipher. Vonne admitted that Child and Family Health Nurses do not understand the function of the ingredients that are highlighted in the advertising or on product packaging, saying, ‘I don’t think we understand what they’re supposed to do’ and Viola added, ‘we’ve actually had an in-service about it once and we asked them [the sales reps] what they were supposed to do and I don’t think they knew’.

3.3 Information gap

The introduction of PD2006_12 requiring all NSW Area Health Services to give effect to the International Code and MAIF Agreement has resulted in the removal of advertising and promotional materials for infant feeding products from many Child and Family Health Centres. Furthermore, in most Area Health Services sales representatives (or detailers) are no longer permitted to visit staff.

There was a perception amongst some CFHNs that this has resulted in a significant information gap that negatively impacts their capacity to advise mothers about choosing a formula milk for their babies. Victoria (CFHN) said, ‘... because we don’t
have any contact [with sales reps], actually I’m finding that actually I don’t know what’s happening so, I don’t know, I feel like we could do with a bit more information’. Furthermore, the (non-commercial) information that is available is thought to be outdated. Vonne (CFHN) noted, ‘We bought the feeding book from the Children’ Hospital which has got a lot of formulas init, and what’s in them in it, I mean it’s not that up to date anymore but [the Director of Service] said that’s all we needed’.

Although a number of CFHNs expressed an awareness that all infant formula products sold in Australia are required to conform to Australian Standards, the perception that the withdrawal of advertising has resulted in an information gap was often accompanied by a belief that there are real and important differences between formula milk products that mothers should be made aware of. For example, Valerie (CFHN) said, ‘We’re not allowed to recommend any formulas so all we can do is sort of tell them about the formulas and then it’s really up to their decision to choose’.

When asked what she tells mothers about the formulas she responded, ‘Well Nan is very close to breastmilk and it’s very easily digested. Um S26 tends to constipate them’. Vanya seemed to believe that the choice of an infant formula could cause or alleviate ‘problems’ mothers have with their infants. She commented, ‘if somebody’s having problems then you’ve just got to keep trying until you find one that works’.

Vanessa had a sense that there is variation in the protein content amongst infant formula brands, noting, ‘The Heinz Nurture. I think it’s got less protein build-up’.

However, protein levels are mandated by Food Standard 2.9.1.

The belief that advertising is a valuable source of information about infant formula was tenacious; so much so that some CFHNs spoke of encouraging mothers to seek out formula advertising from other sources. Viola (CFHN) said, ‘we just ask mothers
to read their own information; that's what I say, what's on the back of the tin ... have you had a look at that? You compare that.’ The idea that nurses are not allowed to inform mothers about real differences between infant formulas is very different from the position taken by the NHMRC, which encourages health professionals to reassure mothers that there is no effective difference between infant formula products, given that there is no evidence that the addition of optional ingredients mitigates the risks associated with artificial feeding. The NHMRC advises health professionals to encourage mothers to choose a formula milk on the basis of price (NHMRC 2003).

The perception that there is a lack of information about the various brands of infant formula available to mothers was not confined to health professionals. Mothers also reported that they did not know how to choose an infant formula product. For example, Vashti said, ‘I bought a tin for [my baby] ... and um honestly, I stood there looking at them all going, Well, what is the difference? I don’t know’ and Vespa said, ‘I don’t think I would know where to go to find out information about formula feeding’.

3.4 Product identification
Respondents were shown several advertisements for toddler milks that had appeared in Australian Parenting Magazines during 2007 (Appendix 2) and asked to identify the product being advertised. Their responses reflected those given by women expecting a first baby, reported in Chapter Four. Only one of the participants (Vera, a grandmother who had formula fed both her daughters and had two formula fed grandchildren) successfully identified all of the products advertised as toddler milks but when asked why she hadn’t called the product ‘formula’ as other respondents had, she said, ‘I was looking at the brand because yes if I was choosing a formula, that’s what I would do’. Others also demonstrated that even when they understood that the
product was intended for children over a year old, they still recognised the products as ‘formula’. For example, when Vee, a GP, was asked whether she would recommend the use of one of the toddler milks she had seen advertised, she talked about the indications for formula use in babies, saying, ‘Obviously breastmilk is preferable but there are times when you don’t want to make them feel guilty if that’s not a possibility’. Interestingly some of the CFHNs expressed their frustration with the idea that the companies were promoting the use of formula milk beyond the end of a child’s first year. Vanessa’s response typified this frustration. She said of the children depicted in the S26 advertisement, ‘they shouldn’t be having formula’. A number of respondents commented that it was the pack shot that told them the product being advertised was formula.

3.5 Response to advertising
Respondents were asked to imagine that the advertisements were people they had met at a party or conference and to imagine what each advertisement would say about him or herself. This is an indirect questioning technique commonly used in market research to determine how effectively an advertisement is delivering its message(s) and to access respondents’ perceptions of the ‘personality’ of a brand.

Overall, the responses indicated that these advertisements were effectively communicating health claims for their brands, not only to the mothers, but also to the health professionals. The relevant responses are reported in Table 7.5.
Table 7.5 – Advertising messages

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vee</td>
<td>I think the concept of getting enough nutrients this one looks like it gives them fish and things like that a good nutrition balance something your child will take something that’s good for their tummies If you want a happy/healthy toddler like this that makes a happy mother and baby something again about a happy healthy toddler it makes him a happy baby I am strong, tall and it’s making my baby grow really well it’s implying that it’s good for their brains, their growth, their um physical well-being the concept is that he’s coping in his environment isn’t he? Because of the strength my product is giving him … protecting him</td>
<td>GP</td>
</tr>
<tr>
<td>Vanessa</td>
<td>Ooh this must be good for my child because these children are … Your child will grow up beautiful it’s good for them, it’s going to stop them from being sick it’s all beautiful safe babies it doesn’t so much make a promise but it does give you the hope that this yeah could help me get what I need for this child. look how intelligent these children are. They’re active; they’re at school</td>
<td>CFHN</td>
</tr>
<tr>
<td>Veronica</td>
<td>I guess immune that we talk about breastfeeding having, those immune properties and they’re adding to their formula so they’re stronger</td>
<td>RD</td>
</tr>
<tr>
<td>Valerie</td>
<td>feeds their potential</td>
<td>CFHN</td>
</tr>
<tr>
<td>Vanya</td>
<td>The fact that it’s organic would appeal to me</td>
<td>CFHN</td>
</tr>
<tr>
<td>Verity</td>
<td>it was always feed their potential</td>
<td>Grandmother</td>
</tr>
<tr>
<td>Vrinda</td>
<td>Good for their tummy with essential vitamins You want your kid to be safe … a ring of protection</td>
<td>Grandmother</td>
</tr>
<tr>
<td>Vera</td>
<td>This is what aids a healthy child. It’s no one wants their kid throwing up every five minutes. If they’re right in the tummy well they’re not going to have poop problems or diarrhoea problems or whatever Anything with gold in the name well that’s a plus This is better than breastmilk</td>
<td>Grandmother</td>
</tr>
<tr>
<td>Venetta</td>
<td>There’s been so much advertising about Omega 3 and I’m sure we don’t eat enough fish so you’d want something with Omega 3 in it.</td>
<td>Grandmother</td>
</tr>
<tr>
<td>Velvet</td>
<td>I think because the word ‘gold’ it gives the impression that it’s not silver and it’s not bronze This one makes me think it’s a healthy child This one’s going to protect your child.</td>
<td>Mother</td>
</tr>
<tr>
<td>Vee</td>
<td>an organic tree hugging nutritionally in tune person is the idea I get from this Bellamy’s ad Kind of shows like a people that are healthy and a bit sporty and are in the sun and look they’re looking well so obviously the product’s working Toddler formula with immune supplement Old faithful [brand] with fish oil for brain development</td>
<td>Mother</td>
</tr>
<tr>
<td>Vashti</td>
<td>This one makes your child happy That’s good because of the shield</td>
<td>Mother</td>
</tr>
<tr>
<td>Vespa</td>
<td>It’s sort of appealing to your desire to make your children happy</td>
<td>Mother</td>
</tr>
</tbody>
</table>
3. 6 Product evaluation

In order to facilitate further discussion of the advertisements, respondents were asked to rank the products advertised from most appealing to least appealing. They were also asked to explain how they had come to their decisions. This technique is also borrowed from market research, where it is used to provide insight into the product attributes valued by consumers. The conversations that ensued provided insight into the processes undertaken by the respondents when choosing a product from amongst many they have seen advertised.

Although the order in which products were ranked differed amongst and between groups, responses to the question of why the products were ranked as they were showed remarkable similarity amongst the respondents. The theme that emerged most frequently was the appeal of graphic elements (Table 7.6).

Table 7.6 – Appeal of graphics in product selection

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Response</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viola</td>
<td>I like the giraffe. It’s a personal choice</td>
<td>CFHN</td>
</tr>
<tr>
<td>Vanya</td>
<td>this one for me. I like the [points to picture of mother and child]</td>
<td>CFHN</td>
</tr>
<tr>
<td></td>
<td>the child’s gorgeous</td>
<td></td>
</tr>
<tr>
<td>Vonne</td>
<td>I think this one, with the mother and the kid in it</td>
<td>CFHN</td>
</tr>
<tr>
<td></td>
<td>because it’s showing a loving mother and a happy baby</td>
<td></td>
</tr>
<tr>
<td>Violet</td>
<td>cause he’s a very healthy, gorgeous kid</td>
<td>CFHN</td>
</tr>
<tr>
<td>Victoria</td>
<td>rosy cheeks, eyes looking at you; he’s a cutie isn’t he?</td>
<td>CFHN</td>
</tr>
<tr>
<td>Vashti</td>
<td>I like that one because it looks a bit like [my son]</td>
<td>Mother</td>
</tr>
<tr>
<td></td>
<td>I just like the picture</td>
<td></td>
</tr>
<tr>
<td>Velvet</td>
<td>Probably because of the characters</td>
<td>Mother</td>
</tr>
<tr>
<td>Vespa</td>
<td>They’re not talking to me; they’re talking to a child or - I wouldn’t choose it because there’s a cute little giraffe on there.</td>
<td>Mother</td>
</tr>
<tr>
<td>Vee</td>
<td>Same [as Vespa’s response above]</td>
<td>Mother</td>
</tr>
<tr>
<td>Venetta</td>
<td>I think the ads with the people in them are more appealing even than cute animals</td>
<td>Grandmother</td>
</tr>
<tr>
<td>Vrinda</td>
<td>Little girl or boy … that would attract more you know just to buy</td>
<td>Grandmother</td>
</tr>
<tr>
<td>Verity</td>
<td>They’re slimy oily fish and they’ve got lots of Omega 3 in them.</td>
<td>Grandmother</td>
</tr>
</tbody>
</table>

Another graphic element, the volume of text (but not necessarily the content) featured in respondents’ evaluations of the products advertised. Viola (CFHN) commented
that she had selected a product because it, ‘Hasn’t got much writing on it’. In contrast Vespa (mother) said that she had selected the Karicare Toddler Gold Plus product because ‘it looks like it has more information on it’ which reassured her that ‘it doesn’t seem like it’s hiding anything’. Furthermore Vespa commented that, ‘It does look very much like a fact sheet.’ Venetta (grandmother) was also reassured by the sheer volume of text presented on the Karicare advertisement, noting, ‘That’s got more information on it, that one’. Vrinda (grandmother) disagreed, arguing, ‘but a mother is not going to be bothered to read a whole thing like that’.

Five respondents (three mothers, the Community Dietician and a CHFN) identified the ‘organic’ claim as particularly appealing. Vespa’s response seemed to capture the sentiment. She said, ‘organic is a bit of a catch word – makes me think it’s maybe not so artificial’. Interestingly, three of the grandmothers (Vera, Verity and Venetta) mentioned the ‘organic’ claim but approached it with some scepticism.

Other values were mentioned but did not recur often enough to be coded as themes. Verity (grandmother) and Vespa (mother) were impressed by what they perceived to be the endorsement of the World Health Organization. Vera (grandmother) found the idea that ingredients in the Nestle product were conducive to ‘healthy tummies’ appealing and Vashti (mother) thought that the familiarity of the Heinz brand would reassure mothers she knew.

3.7 Professional advice
Although the questions asked did not explicitly require reference to professional knowledge or scientific evidence, it was expected that the health professionals interviewed would be concerned to demonstrate that the advice they give mothers about the use of infant formula products was informed by scientific or medical discourse or literature; especially as they were interviewed in their professional roles.
Surprisingly, there was a virtual absence of this kind of talk amongst the health professional respondents. Only Veronica (Community Dietician) appealed to her professional education when she expressed her reluctance to rank the products she saw advertised, saying, ‘I honestly would have to see a lot more information to make an educated decision’.

Although three CFHNs (Viola, Violet and Victoria) referred directly to the NHMRC’s recommendation that mothers be informed that all infant formula products available in Australia conform to the relevant Australian Standard, this was the only point at which any CFHN appealed to the professional or medical discourse in response to the discussion questions. In fact, Table 6 above demonstrates that when asked which of the advertised products they found most appealing and why, the conversation in which the health professionals engaged was very much the same as that engaged by the mothers.

It would appear therefore that the opinions of those whose advice on the choice of infant formula products is sought by mothers are not formed by their professional education but by the same common discussions and media influences that inform the mothers.

4 SUMMARY & OBSERVATIONS

When mothers need to use a formula milk product, many seek advice from these health professionals. It appears that these professionals do not access independent information about infant formula products when asked for advice. Instead, they either refer mothers to sources of advertising or repeat the advertising messages that mothers have heard, lending legitimacy to these messages.
CFHNs and other health professionals expressed their concern that there is a perception that there is a lack of credible, current, independent information about the various infant formula products on the Australian market. However this concern seems to disregard the NHMRC’s position that all products on the Australian market are suitable breastmilk substitutes and that there is simply insufficient evidence to warrant the use of ‘gold’ infant formula products.

Although the sample of health care professionals interviewed for this study was small, their responses suggested that they access many of the same sources of information about formula milk products as mothers do. Furthermore, there was little evidence to suggest that these health professionals engage in critical analysis of advertising materials presented to them. Reliance on advertising materials for information about infant formula may perpetuate the belief that there are important differences between infant formula brands. The promulgation of this belief by trusted professionals may compound mothers’ vulnerability to the persuasive effects of advertising, leading them to believe that the use of certain infant formula products can provide health benefits to their children.

Many of the messages conveyed by toddler milk advertisements contradict public health messages about infant feeding when they are applied to advertisers’ entire formula ranges, which include infant and follow-on formula products. The results of this study suggest that mothers may be unable to access independent information from their primary health care providers that will aid them in their decisions around the use of infant formula products and therefore rely entirely on advertising, or on the recommendations of others who repeat advertising messages.

The study reported in this chapter is exploratory in nature and cannot be generalised to the populations of Australian mothers, grandmothers or primary health care
providers. However, it does raise a number of issues of concern and indicate the need for further, more comprehensive research to be conducted amongst these groups.

The following chapter will synthesise the findings of the studies reported in Chapters Four to Seven, which together present a remarkably coherent picture of the influence of the advertising of toddler milk products on attitudes, beliefs and perceptions about infant feeding.
Chapter Eight

Synthesis and Discussion

The preceding four chapters have described a series of studies undertaken simultaneously, using a mixed methods convergence design. This chapter will synthesise the results of these studies, discuss their limitations and make recommendations for further research and policy development.

Four themes have emerged with remarkable consistency from the data collected across each of the four studies. These themes will be described in turn, noting the contribution each study has made and demonstrating the utility of a mixed method convergence design for triangulation of data about complex public health issues.

1 SYNTHESIS

This is the first Australian study to examine parents’, grandmothers’ and health professionals’ attitudes towards formula feeding. The results indicate that attitudes towards formula feeding are only weakly correlated with attitudes towards breastfeeding, suggesting that the decision to introduce infant formula may be independent of attitudes towards breastfeeding. This result is consistent with Chezem and colleagues’ (1998) research which found significantly increased breastfeeding duration amongst mothers who intended to avoid infant formula use. This is also the first Australian study to examine the influence of toddler milk advertising on attitudes towards formula feeding. The results suggest that toddler milk advertising is an important factor contributing to the extremely poor rates of exclusive breastfeeding observed in Australia.
1.1 Confusion or deception?
The evidence gathered for this project indicates that Australian consumers cannot or do not differentiate between advertising for toddler milks and advertising for infant and/or follow-on formula. This result is consistent with British research indicating that consumers perceive advertisements for follow-on formula to be advertisements for infant formula (NOP World for Department of Health 2005).

The perception that toddler milk is ‘formula’ was apparent in the responses to print advertising given by participants in both of the quantitative arms of this project (studies one and four). Mothers expecting a first child, mothers of more than one child, grandmothers and Child and Family Health Nurses all described toddler milk products as ‘formula’.

There were two dimensions to this perception. At its simplest, the perception that toddler milk advertising is advertising for infant formula arose from confusion precipitated and reinforced by the similarity between toddler milk packaging and infant formula packaging. However, even when respondents understood that the product they were seeing advertised was suitable only for children more than a year old, they still referred to it as ‘formula’. This revealed a more sophisticated understanding of toddler milks as being part of a group or ‘line’ of formula products and toddler milk advertising as promoting all of the formula products in that line. In some cases, the advertisements themselves appeared to trigger a revision of respondents’ definitions of ‘formula’ to include toddler milk.

Results from the survey revealed that the perception that toddler milk advertisements also advertise infant formula is not limited to the small samples recruited for the qualitative arms of this project. Most of those parents who believed they had seen an advertisement for an infant formula product reported that they had only seen
advertisements placed directly by manufacturers or importers. Since there were no recorded breaches of the MAIF Agreement between July 2003 and June 2009, these could only have been toddler milk advertisements. Furthermore, those who reported that they had only seen direct advertisements were more likely to believe that they had seen infant formula advertised than those who reported having seen advertisements placed by retailers, which could therefore have been advertisements for infant formula, follow-on formula or toddler milk. This suggests that toddler milk advertising is functioning as de facto advertising for infant formula in the Australian marketplace.

Furthermore, it appears that toddler milk advertising is effectively promoting the use of infant formula products. Amongst parents who did not hold undergraduate or higher degrees, exposure to toddler milk advertising was associated with having a more positive attitude towards formula feeding per se. This result is particularly important because mothers with less education are over-represented in lower socio-economic groups and these women are at highest risk of formula use and premature cessation of breastfeeding (Amir and Donath 2008).

Recent research suggests that sociodemographic features, including age, education and ethnicity, are a proxy for modifiable factors that explain the disparities in infant feeding practice between women of different SES. Nommsen-Rivers and colleagues found ‘comfort with the idea of formula feeding’, measured prenatally, was the strongest predictor of the magnitude of American first time mothers’ intention to breastfeed and to breastfeed exclusively (therefore, to avoid infant formula) for the first six months. Formula feeding comfort was higher amongst women who were less educated or African-American. Significantly, the effect of formula feeding comfort on breastfeeding intention was two to six times greater than that of comfort with the
idea of breastfeeding (Nommsen-Rivers, Chantry et al. 2010). Thus interventions
designed to improve breastfeeding outcomes should include protecting women from
advertising messages that increase their comfort with formula feeding.

1.2 Immersion
Exposure to formula advertising appears to be almost universal in Australia. More
than 90% of the parents surveyed for this study indicated that they had seen an infant
formula product (depicted on the survey) advertised. The MAIF Agreement is failing
to protect parents from formula advertising and Australia is therefore failing to
discharge its obligation to the international community to give effect to the
International Code of Marketing of Breastmilk Substitutes and subsequent resolutions
addressing this issue.

Toddler milk advertising plays a significant role in the exposure of parents to formula
advertising. Responses to the Study Three indicated that more than half of those
participants who believed they had seen infant formula advertised had actually seen
toddler milk advertising.

This project provides considerable evidence suggesting that toddler milk advertising
is used in place of advertising for infant formula in Australia in order to circumvent
the restrictions included in the MAIF Agreement. Toddler milk advertisements
appeared with significantly greater frequency in Australian parenting magazines than
they did in magazines from the UK (where follow-on formula advertising is
permitted), the USA or Canada (where infant and follow-on formula advertising is
permitted). This finding, along with the observation that follow-on formula
advertising occurred more frequently in British magazines than they did in Australian,
American or Canadian magazines suggests that formula advertising is shaped by the
regulatory environment; where infant and/or follow-on formula advertising is
prohibited, other formula products that share brand identities with infant formula are advertised in their place.

This is consistent with the behaviour exhibited by multinational tobacco companies when faced with restrictions on the advertising of their products. Assunta & Chapman's (2004) examination of Master Settlement Agreement documents relating to the promotion of cigarettes in Singapore following the introduction of bans on the promotion of tobacco products found that Philip Morris applied the 'Alpine' brand to a beverage product in the months prior to the launch of 'Alpine' cigarettes. This enabled the company to bring its ‘Alpine’ (cigarette) brand into the minds of potential purchasers without contravening local laws prohibiting tobacco advertising. Australian toddler milk advertising shares many of the features of Philip Morris’ Alpine strategy; notably advertising focuses on the brand, rather than the product and remarkably similar packaging design.

1.3 Subversion
Health professionals interviewed for Study Four indicated that there is little information available to them, and therefore to mothers, about infant formula. Furthermore, results from Study Three suggested that there is considerable confusion around the health implications of infant feeding choices. Large proportions of respondents indicated that they neither agreed nor disagreed with statements about health risks associated with formula use, even though most respondents agreed with the statement ‘Breastfed babies are healthier than formula fed babies’.

This may reflect reluctance on the part of health promoters, researchers and primary health care providers to discuss the risks associated with infant formula use. In fact reference to the use of infant formula seems to be studiously avoided in health promotion messages about infant feeding. One of the mothers who participated in
Study Four commented that although she had been able to access plenty of information about the ‘health benefits’ of breastfeeding, she would not know where to get information about the risks associated with the introduction of infant formula. It seems that ‘formula’ has become the new ‘f-word’ in health promotion; the ‘Voldemort’ of the infant feeding world – that which shall not be named or discussed1.

This ‘Voldemort Effect’ appears to have arisen as a reaction to feelings of guilt expressed by mothers who formula feed their babies and out of a desire to avoid inflaming those feelings. For example, the NHMRC’s Infant Feeding Guidelines for Health Workers (incorporated into the Dietary Guidelines for Children and Adolescents in Australia) makes four references to the ‘risks of not breastfeeding’ and the only mention of the ‘risks associated with formula feeding’ is an injunction to ‘minimise the risks associated with formula feeding, and avoid inducing guilt in the mother’ (NHMRC 2003, p305). This might explain the responses given by respondents in Study Three which indicate that while most respondents agree that breastfed babies are healthier than formula fed babies, they do not believe that feeding babies formula increases health risks. It appears that while many parents believe that ‘not breastfeeding’ is an unhealthy practice, formula itself is viewed as benign; the idea seems to be that it is the deprivation of human milk that is harmful rather than the exposure to formula.

Murphy (2004) reported that British women commonly minimised the potential risks associated with formula feeding in anticipation of future formula use as a way of

1 This analogy was first drawn in 2008 by Julie Smith, Mark Dunstone and Megan Elliott-Rudder in a Working Paper produced for the Australian Centre for Economic Research in Health which can be accessed at http://acerh.anu.edu.au/publications/ACERH_WP4.pdf
defending their moral status as ‘good mothers’. It seems likely that advertising messages facilitate this process. Further any mention of the risks associated with infant formula use can be viewed as an attack on (formula feeding) mothers because it robs them of the ‘denial of injury’ defence against the charge that they are ‘bad mothers’. Wolf’s (2007) and Kukla’s (2006) critiques of the US National Breastfeeding Awareness Campaign which highlighted the risks associated with formula use, provide striking and articulate examples of the minimisation of the risks associated with formula feeding.

The practice of minimising the risks described by Murphy and Lee and epitomised by Kukla and Wolf is known in the psychological literature as a strategy for minimising ‘cognitive dissonance’. Festinger (1957) observed that when people behave in ways that are inconsistent with their beliefs, perhaps because they feel there is no other option available to them, they experience profound psychological discomfort (dissonance) which they seek to resolve. Usually this is achieved by altering the attitude (in this case the belief that formula feeding carries health risks) to accommodate the behaviour (in this case formula feeding).

This ‘Voldemort Effect’ has also affected the manner in which research questions about infant feeding outcomes have been framed. Smith and colleagues (2009) found that only 11% of research that found adverse health outcomes associated with infant formula use correctly identified this relationship in the title or abstract. Instead many titles and/or abstracts inaccurately implied a correlation between breastfeeding and adverse health outcomes. This reflects the routine use of formula fed babies as the reference group in research design which has come to obscure the dangers of early exposure to infant formula and is likely to have contributed to the lack of awareness
of the risks associated with formula feeding amongst health professionals (Berry and Gribble 2008; McNiel, Labbok et al. 2010; Stuebe 2009).

It has also been observed that much of the breastfeeding promotion literature focuses on the health ‘advantages’ or ‘benefits’ of breastfeeding; often presenting breastfeeding as the ‘best’ or optimal way to nourish infants. However, problems with this approach have been identified. Describing breastfeeding as ‘best’ or as conferring health benefits positions infant formula as the standard treatment – adequate, benign and expected – while breastfeeding is displaced as a physiological norm and relegated to the position of exceptional, optional, enriched infant feeding choice. Promoting breastfeeding in this way, without reference to the risks associated with early exposure to infant formula, is also likely to reinforce the perception (described above) that while depriving a child of breastmilk may have adverse health outcomes, formula itself is benign (Berry and Gribble 2008; Stuebe 2009).

If advertising messages remain unchallenged the belief that infant formula use is without risk is likely to flourish and there is evidence that this is the situation in Australian mothers and health care providers. In the absence of independent information about infant formula and the health consequences of formula feeding, advertising us allowed to fill the gap, presenting itself as information or education rather than persuasion. Responses collected from Studies One and Four suggest that mothers, grandmothers and Child and Family Health Nurses accept the messages they find in advertising material quite uncritically. This result is consistent with British research which found that parents rely on advertising messages to inform their infant formula choices and that these messages are often reinforced by health professionals (Mitchell 2009).
However, when applied to infant formula, the messages contained in Australian toddler milk advertisements subvert and undermine public health messages about the importance of breastfeeding and particularly the importance of breastfeeding exclusively for the first six months of a baby’s life. Mothers interviewed for Study One reported that they understood that the advertisements they had seen were claiming that formula brands could confer health benefits, such as improved physical, cognitive or visual development or protection from illness or allergy; messages that are not supported in the literature (Kramer and Kakuma 2002; Osborn and Sinn 2007a, 2007b; Simmer 2001). These claims closely reflect the reasons given by Australian mothers for choosing breastfeeding which included ‘breastfeeding enhances my baby’s immunity’, ‘helps prevent allergies’ and ‘breastfeeding enhances intelligence’ (Brodribb, Fallon et al. 2007). They are also consistent with the messages found in Australian infant formula advertising since the beginning of last century (Thorley 2008) and with American infant formula advertising (Stang, Hoss et al. 2010).

The claims found in formula advertisements are worded carefully to avoid the Food Standards Australia New Zealand definition of a prohibited ‘health claim’ (Standard 1.1A.2); instead these claims are often described as ‘function claims’, ‘nutritional claims’ or ‘content claims’. However, the evidence gathered for this project suggests that consumers do not make such fine distinctions. More than 90% of the parents surveyed for Study Three reported that they had seen a formula advertisement that contained at least one health, nutritional or content claim and almost 30% of respondents believed that infant formula is ‘as good as breastmilk’. It appears then, that constant exposure to formula advertising (including toddler milk advertising) is reinforcing formula feeding as a healthy choice; an idea that is consistent with the
theories of advertising and mass communication outlined in the literature review (Ehrenberg, Barnard et al. 1997; Hoek and Gendall 2006; Renaud, Bouchard et al. 2006; Yanovitzky and Stryker 2001).

By minimising the differences between breastfeeding and formula feeding, Australian toddler milk advertisements subvert public health messages about the importance of breastfeeding. Close readings of the advertisements indicated that they appropriate messages about the importance of breastfeeding in order to position their formula brands as functionally equivalent to breastfeeding. Furthermore, mothers interviewed for Study One indicated that they found the advertising messages believable and saw no need to seek independent verification. This finding was consistent with the observations of British research which found that parents mentioned company helplines, packaging and websites as useful sources of information (Mitchell 2009).

Many respondents believed that a mother’s lifestyle choices (such as tobacco, alcohol or medicinal drug use) could compromise the quality of her breastmilk, thus rendering infant formula a more appropriate feeding choice. This view is not consistent with the evidence; breastfeeding is known to protect the infants of mothers who smoke from lower respiratory tract infection (Nafstad, Jaakkola et al. 1996); moderate maternal alcohol intake has been shown to have no detectable developmental effect on breastfeeding infants (Little, Northstone et al. 2002); and very few medications are incompatible with breastfeeding (Hale 2008). However, it may reflect the belief that infant formula is so nearly equivalent to breastfeeding that even the smallest contamination or compromise renders formula feeding the safer option (Hale 2008).

1.4 Pervasion

It is not surprising that parents are unaware of the importance of avoiding infant formula, given that formula advertising dominates the information stream. Formula
advertising informs the views of mothers, their mothers, their peers and their health care providers and there appears to be little if any information available to these groups about the risks associated with infant formula use. This situation has been described in the literature as an asymmetric flow of information; a situation in which ‘more or better information is held by one transacting party’ (Mendoza 2010, p9).

Health professionals – such as CFHNs, paediatricians and dieticians – are viewed by mothers, grandmothers and each other as important sources of information and verification of advertising messages. Furthermore article 5(d) of the MAIF Agreement exhorts infant formula manufacturers and importers to refer mothers to health care professionals for independent advice. However, it would appear that consulting a health professional is no guarantee that mothers will receive independent advice or information about the risks associated with the use of formula products. In the absence of independent scientific or factual information about formula use or formula products Child and Family Health Nurses and other health professionals are forced to rely on advertising or other promotional material for their information, and repeat these messages to mothers. Where advertising is not directly available to them, many of these health care providers see no option but to refer mothers to others who do have access to advertising, such as pharmacies and other mothers.

The influence of formula advertising is evidenced in the common belief amongst both mothers and CFHNs that there are real and important differences between infant formula brands. This is consistent with British research which found that parents frequently switched brands of infant formula in an effort to solve health or behavioural problems (Mitchell 2009). This view persists in the face of evidence to the contrary and a clear statement from the NHMRC advising health workers to encourage mothers to choose a brand of infant formula based on price (NHMRC
2003). It reflects the efforts of advertisers to position their products as different from competing formula brands (even while simultaneously positioning them as similar to breastfeeding).

It is not surprising to find that health professionals, such as CFHNs, are not immune to the influence of advertising. There is a considerable body of evidence demonstrating that exposure to pharmaceutical advertising or ‘detailing’ influences doctor’s prescribing behaviour (Anderson, Silverman et al. 2009; Lexchin 1993; Orlowski and Wateska 1992; Wazana 2000; Ziegler, Lew et al. 1995). Furthermore, information provided by pharmaceutical companies (some of whom also manufacture infant formula) to health professionals is often inaccurate and tends to present only information that reflects favourably on its products (Cardarelli, Licciardone et al. 2006; Lexchin 1997; Ziegler, Lew et al. 1995).

With only a single exception, health professionals interviewed for this project failed to demonstrate the application of their educational, professional or critical skills in their approach to advertising material. This is consistent with Australian research that has found that health professionals’ knowledge and attitudes about infant feeding are determined by their personal experience rather than their professional education (Brodribb, Fallon et al. 2008a, 2008b). In their study of 161 final year Australian GP Registrars, those who had more than 52 weeks cumulative personal breastfeeding experience (self or partner had breastfed) had the highest breastfeeding knowledge and attitude scores, whereas those who had more than 26 weeks formula feeding experience (measured as <26 weeks breastfeeding experience) had less positive attitudes towards breastfeeding and similar levels of breastfeeding knowledge to those who had no children.
Clearly there is a need to correct the information asymmetry that characterises the Australian infant feeding environment and prevents mothers from making conscious, informed choices about feeding their babies. This will include ensuring that mothers and their health care providers have access to independent, evidence based information and education about infant formula use. It will also include suppressing the market power of infant formula manufacturers, importers and retailers by prohibiting the advertising of formula milks or brands to the general public, mothers and health professionals as recommended by the World Health Assembly.

2 LIMITATIONS

The limitations inherent in each of the four studies must be acknowledged. The qualitative design employed for Study One produced rich data about women’s understandings of print advertisements for Toddler Milk products. However this design also necessitated the use of a small, purposive sample. Thus care should be taken when generalising the findings of this study. Study Two, a quantitative content analysis of print advertisements for formula milk products published in parenting magazines, produced data about the comparative frequency with which these advertisements appeared across varying regulatory contexts. Although inferences about the reasons for these differences can be made, the study employed a cross-sectional design and so is not able to establish causation. Study Three, which utilised survey methodology, exploratory factor analysis and multiple regression analysis, identified a relationship between exposure to advertising for toddler milk products and a more positive attitude towards formula feeding per se. Again the cross-sectional design is able to establish association but not causation. Study Four, another qualitative design, produced insight into the flow of information about infant formula products between mothers and primary health care providers (primarily CFHNs); and
CFHNs’ approaches to advertising material. As with Study One, the limited sample size should encourage the exercise of caution in the application of its findings.

As each of the four studies provides a source of triangulation for each of the others and key themes emerged consistent from all four studies, confidence in the validity of the results is warranted.

3 CONCLUSIONS AND RECOMMENDATIONS

This is the first Australian research to examine attitudes about formula feeding, the relationship between attitudes about formula feeding and attitudes about breastfeeding, and the influence of advertising on these attitudes.

Toddler milk advertisements promote infant formula brands and in doing so promote artificial feeding to health professionals, mothers and the wider community in direct competition with breastfeeding promotion efforts. Infant formula manufacturers, importers and retailers will always have larger promotional budgets than governments or health promotion agencies and as a result efforts to promote breastfeeding will always be drowned out by commercial interests. Implementation of the International Code and subsequent WHA resolutions addressing this issue – including the prohibition of the advertising of any formula brand the prohibition the use of health, nutritional or functional claims for formula products or brand and the prohibition of the provision of ‘education’ for health professionals, parents or the general public by infant formula manufacturers, importers or retailers – is a cost effective intervention that can be used to multiply the effect of breastfeeding promotion strategies. It is not the only measure that is required to address poor breastfeeding rates in Australia, but failing to protect mothers and their infants in this way will almost certainly limit the effectiveness of breastfeeding promotion efforts resulting in significant budgetary
waste around breastfeeding promotion. A recent Parliamentary Inquiry recommended Commonwealth legislation be enacted to protect consumers from the advertising of breastmilk substitutes (House of Representatives Standing Committee on Health and Ageing 2007). This study provides empirical evidence of the necessity for carefully worded legislation that defines advertising in a way that captures any commercial messages about formula brands or products and imposes penalties for violations that are severe enough to act as an effective deterrent.

This project provides clear evidence that the MAIF Agreement is failing to achieve its stated purpose, ‘to contribute to the provision of safe and adequate nutrition for infants by the protection and promotion of breastfeeding’. Self regulation of advertising that is detrimental to public health has not been effective in other areas, notably tobacco (Chapman 2007) and alcohol (Smith, Foxcroft et al 2009), and the evidence collected for this study suggests that self-regulation of infant formula advertising is also ineffective.

Exposure to formula advertising approaches universality in Australia, and yet only a handful of the hundreds of complaints received by the Advisory Panel since 1992 have been deemed to be infant or follow-on formula and therefore in violation of the Agreement (Advisory Panel on the Marketing in Australia of Infant Formula 2002, 2003, 2004, 2005, 2008, 2009; Knowles 2003). Formula advertising messages undermine public health messages and mislead consumers by minimising the differences between infant formula and human milk; misrepresenting the weight of available scientific evidence and presenting formula as healthy, benign alternative to breastfeeding. In addition that many consumers and health care providers accept advertising claims found on product labels quite uncritically.
Food Standards Australia and New Zealand is currently reviewing Standard 2.9.1 Infant Formula Products and Standard 1.2.7 Health and Nutritional Claims. It is recommended that toddler milks be included in the scope of this standard. It is further recommended Section 20 (entitled *Prohibited Representations*) be revised to prohibit claims that meet both the current narrow definition of ‘health claims’ articulated in Standard 1.1A.2 and the broader definition of ‘general level’ health claims articulated in Proposal P293 that would capture ‘all claims referring to nutrient content, nutrient function, enhanced function, reduction of disease risk or maintenance of normal health’.

Health professionals, especially those who provide primary health care for mothers and young children do not appear to have access to independent, evidence-based information about infant formula products or the risks associated with their use, especially in the first six months of an infant’s life. This is hardly surprising since even the Infant Feeding Guidelines for Health Workers’ and the Australian National Breastfeeding Strategy avoid using the words ‘risk’ and ‘infant formula’ in the same sentence, instead leaving readers with the impression that it is only the withholding of breastmilk that carries risk. The Infant Feeding Guidelines are currently under review. It is recommended that revision include a clear articulation of the risks associated with infant formula use, the costs to the Australian community associated with formula use and the importance of supporting mothers to avoid the use of infant formula.

The Australian National Breastfeeding Strategy explicitly excludes restriction of the marketing of infant formula products (Australian Health Ministers’ Conference 2009). It is recommended that the Strategy be revised to include consideration of legislation to prohibit the marketing of formula products and brands. Furthermore, it is
recommended that the inclusion of ‘the importers, manufacturers and retailers of infant formula’ as stakeholders in the National Breastfeeding Strategy be reconsidered. Importers, manufacturers and retailers of infant formula are in direct competition with breastfeeding promotion and it may be counter-productive to include them in decisions about the promotion of breastfeeding.

Information about the risks associated with formula use is not reaching mothers or the wider community. Further research is required to determine the most effective way to communicate the risks associated with the use of infant formula, especially in the first six months, so that health care providers and mothers can make informed decisions about feeding babies and thereby minimise the risks associated with formula feeding where it is unavoidable.

Evidence suggests that adherence to the infant feeding practices recommended by the NHMRC and the WHO is rare amongst Australian mothers and yet very little is known about the dynamics of the decision to introduce infant formula. In 2001 the health costs of weaning 30 per cent of Australian infants onto infant formula by three months of age was estimated to be approximately $290 million a year, based on an analysis of just five illnesses, the incidence of which is known to be associated with formula feeding (Smith 2001). Further research is urgently needed to investigate what mothers know about infant formula, why they introduce infant formula and what interventions are effective in enabling them to avoid the use of infant formula is urgently needed.
Chapter Nine

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## Appendices

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1 APPENDIX ONE

STUDY THREE – SURVEY INSTRUMENT

The instrument is reproduced smaller than it was in the field.
INFANT FEEDING SURVEY

The answers you give on this survey will help us to understand what parents think about infant feeding. **It will not be used for marketing purposes and your answers will remain anonymous.**

SECTION A : Please indicate how strongly you agree or disagree with each of the following statements by circling the number that most closely matches how you feel.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Most mothers have to feed their babies some formula.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Breastfeeding mothers should not drink any alcohol.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. Babies who are fed formula instead of breastmilk are more likely to be admitted to hospital than babies who are only breastfed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. A two year old is too old to be fed from a baby bottle.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. Mothers who eat an unhealthy diet should formula feed their babies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. Mothers who smoke should formula feed their babies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Formula fed babies are just as healthy as breastfed babies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. It is common for mothers to be unable to make enough breast milk for their babies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. Mothers should not breastfeed in public places.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. Breastfed babies are healthier than formula fed babies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. A one year old is too old to be fed from a baby bottle.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. Breastfeeding makes a mother’s life easier.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. Feeding a baby formula, even just once, increases the chances a baby will get sick.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. Mothers who have to take prescribed medicines should not breastfeed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. It is harder for fathers of breastfed babies to bond with their babies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. Breastfed babies who are given a bottle of formula before bed sleep longer at night.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. Formula feeding mothers get more help and support from family and friends that breastfeeding mothers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. Breastfeeding has health benefits for mothers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. It is too hard for a mother to keep breastfeeding if she has to go back to work or study.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. A two year old is too old to be breastfed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21. Modern infant formulas are as good as breastmilk.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22. A one year old is too old to be breastfed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23. Formula feeding makes a mother’s life easier.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
24. It is harder for formula feeding mothers to bond with their babies.

25. Babies who are fed formula instead of breastmilk are more likely to become overweight or obese.

26. It is possible to overcome nearly all breastfeeding problems.
SECTION B
These questions are about the people you spend time with. Please tick only one answer for each question.

27. Before introducing solids, most of my friends who are mothers
   □ Never feed their babies formula
   □ Only feed their babies formula
   □ Combine breastfeeding and formula feeding
   □ Don’t know

28. Most of my friends who are mothers
   □ Never use any formula
   □ Start using formula before 6 months
   □ Start using formula between 6 and 12 months
   □ Start using formula after 12 months
   □ Don’t know

29. Most of my friends who are mothers
   □ Never breastfeed their babies
   □ Breastfeed for less than six months
   □ Breastfeed for between 6 and 11 months
   □ Breastfeed for between 12 and 17 months
   □ Breastfeed for between 18 months and 2 years
   □ Breastfeed for longer than 2 years
   □ Don’t know

SECTION E – Employment

30. How old was your first baby when his or her mother returned to work or study outside the home?
   ________________ □ Not in paid work □ Don’t know

31. How old was your last baby when her or his mother returned to work or study outside the home?
   ___________________________ □ Not in paid work □ Don’t know/Only have 1 child
SECTION C – Breastfeeding Experience

If your first baby has not been born yet, please skip this section.

32. Have any of your babies ever been breastfed? Yes No If YES, please answer the following questions:

33. Did you or your partner experience difficulties with breastfeeding such as inability to produce enough milk, sore nipples, mastitis or difficulty getting a baby to attach and suckle at the breast that were … ?

☐ Severe ☐ Moderate ☐ Minor ☐ No difficulties

34. Did breastfeeding ever cause your baby to become unsettled or uncomfortable?

☐ Always ☐ Often ☐ Sometimes ☐ Never

35. Was a Child and Family Health Nurse able to help you or your partner to overcome breastfeeding difficulties so that breastfeeding could continue for as long as you or your partner wanted? Yes No

36. Did a doctor, midwife or child health nurse ever advise you or your partner to give your baby formula? Yes No

37. How old was your first child the last time he or she was breastfed?

________________________________________________________  ☐ Don’t know

38. How old was your last child the last time he or she was breastfed?

________________________________________________________  ☐ Don’t know

Section D – Formula Feeding experience

If your first baby has not been born yet, please skip this section.

39. Have any of your babies ever been fed infant formula? (circle one) Yes No If YES please answer the following questions:

40. Did you or your partner ever experience difficulties with bottle feeding such as constipation, difficulty getting the baby to take formula or difficulty finding a formula that suits the baby that were … ?

☐ Severe ☐ Moderate ☐ Mild ☐ No difficulties

41. Did feeding your baby formula ever cause your baby to become unsettled or uncomfortable?

☐ Always ☐ Often ☐ Sometimes ☐ Never

42. How old was your first child the first time he or she was fed formula?

________________________________________________________  ☐ Never fed formula ☐ Don’t know

43. How old was your first child the last time he or she was fed formula?

________________________________________________________  ☐ Never fed formula ☐ Don’t know/only have 1 child

44. How old was your last child the first time she or he was fed formula?

________________________________________________________  ☐ Never fed formula ☐ Don’t know

45. How old was your last child the last time she or he was fed formula?

________________________________________________________  ☐ Never fed formula ☐ Don’t know/Only have 1 child
SECTION F – Advertising - These questions are about your experiences.

46. Have you ever seen or heard an advertisement for formula (eg television, magazine or newspaper)?  YES  NO

If YES, please answer the following questions:

47. Have you ever seen any of these products advertised?  Tick all the products you have seen advertised.

☐ Nurture Gold+  ☐ Karicare  ☐ Bellamy's  ☐ Nan  ☐ S26

☐ Another product (which one?)______________________________________________

48. Where have you seen these products advertised?

☐ Television  ☐ Magazine  ☐ Brochure  ☐ Expo or conference

☐ Sample bag  ☐ Catalogue  ☐ Somewhere else
(eg bounty) (eg supermarket or chemist) Where?

49. What did these advertisements tell you about the product? Tick all that apply.

☐ makes babies healthy/happy  ☐ is convenient  ☐ ensures proper growth and development

☐ contains nutrients such as omega 3, iron or probiotics

☐ strengthens immunity  ☐ is like breastmilk

☐ improves brain development  ☐ something else (what?)

50. What types of formula have you seen advertised?  Tick all the types you have seen.

☐ Suitable from birth  ☐ Suitable from 4 - 6 months  ☐ Suitable from 12 months  ☐ Don't know

SECTION G

Please write your answers to the following questions. If you aren’t sure, then please write ‘don’t know’.

51. Ideally, for how long do you think babies should be fed nothing but breastmilk?

__________________________

52. At what age do you think mothers should stop giving breastfeeds altogether?

__________________________

53. At what age do you think formula fed babies should start solids?

__________________________

54. At what age do you think mothers should stop giving bottles?

__________________________
Demographic Question

1. Are you □ a mother or □ a father?

2. How old are you? (circle one)
   - Under 18
   - 18-19
   - 20 – 24
   - 25 – 29
   - 30 – 34
   - 35 – 39
   - 40 – 45
   - 45+

3. What is the highest level of school or degree you have completed? (please tick one)
   - Yr 10 or lower
   - HSC
   - TAFE or Trade
   - Undergraduate degree
   - Postgraduate diploma/degree

4. Are you
   - □ single
   - □ married or living with a partner
   - □ widowed, divorced or separated?

5. What is your combined total household income per year?
   - □ $6000 or less
   - □ $6001 - $25 000
   - □ $25 001 - $75 000
   - □ $75 001 - $150 000
   - □ over $150 000

6. How many children do you have?
   - □ Expecting a first
   - □ 1
   - □ 2
   - □ 3
   - □ 4
   - □ 5 or more

7. In what year was your oldest child born? ___________________________________________

8. In what year was your youngest child born? ________________________________________

9. Did your mother breastfeed you or your siblings for more than 6 months?
   - □ Yes
   - □ No
   - □ Don’t Know

Thank you for your time. The answers you have given will be combined with those given by other parents and analysed using statistics to find any patterns that occur amongst parents. The results will form part of a PhD thesis and they will be offered to academic journals for publication. Your answers will remain anonymous and you will not be contacted again for marketing purposes as a result of having completed this survey.

Please put your name and phone number onto raffle ticket and give it to the person who handed you this survey if you would like to go into the draw to win a $400 gift voucher from a major department store.
1 APPENDIX TWO

STUDY FOUR – TODDLER MILK ADVERTISEMENTS
Please see print copy for images
Please see print copy for images
Please see print copy for images

SOURCE: Woolworths Australian Parents October/November 2007, p41