

**SOCIAL DETERMINANTS OF CHILDHOOD OVERWEIGHT  
AND OBESITY IN SOUTH AUSTRALIAN FAMILIES:  
PARENTING, WORK PATTERNS, AND GENDER ROLES**

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## Thesis Abstract

Obesity in children has increased rapidly in Western countries over the past three decades. Childhood obesity is a major public health issue because it contributes to immediate health and psychosocial problems in children, as well as increased risk of adult obesity and associated chronic disease, and restricted life opportunities. Obesity represents an inequality in health as, in Western countries, it is now most common in the most disadvantaged groups. However, it is not clear how the prevalence of childhood obesity has come to be socially patterned.

A relatively small body of literature provides theoretical insights as to what might be occurring in families of low socio-economic status (SES) to increase the likelihood of childhood obesity. From recurrent organising explanations, three were selected for investigation: food-related parenting beliefs and practices; parental work patterns; and gender roles within families. Each of these domains is shaped by broader ideologies and structural arrangements. Briefly, it is argued that contemporary parenting beliefs and practices may lead parents to oblige children's food requests, even when not in the child's nutritional interests. Furthermore, parents may lack the ability to negotiate with children around food or to be firm when denying requests for unhealthy food. These parenting beliefs and practices may be most common in low SES families. Secondly, in contemporary society it is common for both parents to work, sometimes by choice, but often simply to achieve a reasonable standard of living. Work hours and the demands of work have increased over recent decades, contributing to time pressure for parents which in turn may compromise the family food environment. This could be most common in low SES families, lacking resources to alleviate time pressure in other ways. Thirdly, despite women now occupying a wider range of roles in society, gender stereotyping persists. In families, this means that women are responsible for food provisioning and childrearing, regardless of other demands on their time. This may be more common in low SES families than in other families, potentially contributing to SES differentials in childhood obesity.

A cross-sectional study was undertaken within an existing birth cohort, when children were 9-10 years old, to investigate the extent to which the three aspects of family life were associated with obesity and overweight in children and whether this contributed to the social patterning of childhood overweight/obesity. Families in the sample were recruited during the mother's pregnancy. Between 1998 and 2000, pregnant women were recruited from one public hospital and three private obstetric practices located in Adelaide. Mothers who agreed to participate in the 9-10 year interviews were invited to complete a structured personal interview, as well as several self-complete questionnaires. Children were invited to have their height and weight assessed, from which body mass index (BMI) was derived. Families who participated in the interviews are predominately Caucasian but otherwise broadly representative of the state population.

Results presented in this thesis are based on the first 300 interviews completed. Maternal educational attainment at the time of the 9-10 year interview was selected as the indicator of SES (with categories of incomplete high school, high school completed, Technical and Further Education (TAFE) qualification, and university degree).

In the study sample, 16 percent of children were overweight and a further 4 percent were obese at 9-10 years. Maternal educational attainment at this time point was the only family characteristic clearly associated with the combined outcome of childhood overweight/obesity. However, there was not a strict gradient in this relationship. Instead, childhood overweight/obesity was most prevalent in families in which the mother had gained a TAFE qualification. This may reflect the diverse nature of TAFE qualifications and the fact that around half of the women in this category had not completed high school.

A set of 10 self-complete items was developed to characterise relevant parenting beliefs and practices. When considered separately, only the belief that children have unalterable food preferences was associated with child weight status: mothers who held this belief were *less* likely than other mothers to have overweight/obese children. When the beliefs and practices were amalgamated using factor analysis to form subscales reflecting Obliging, Influence and Firmness, the Obliging score were associated with child weight status: more obliging mothers were *less* likely to have overweight/obese children. However, there was limited evidence for differences in Obliging, Influence and Firmness scores for mothers in different SES groups. On balance, it seems most likely that these findings reflect changes in food-related parenting beliefs and practices subsequent to children becoming overweight or obese. This underscores the need for longitudinal research in this domain.

Two parent families were the focus of analyses concerning parental work arrangements. In particular, the circumstances in which parents frequently worked family-unfriendly work schedules (at night, after 6pm weekdays or on weekends) was investigated. Attention to fathers' employment patterns is a relatively novel aspect of this research. The strongest research finding in this thesis was that when the partner of the study mother worked family-unfriendly schedules, children were most likely to be overweight or obese. While this did not appear to explain the higher prevalence of overweight/obesity in the lowest SES group, it was relevant to childhood overweight/obesity in families where the mother held a TAFE qualification. Additionally, almost half of children in families where both parents worked family-unfriendly work schedules were overweight or obese, although this was a minority of families. Mothers who reported poorer work-life balance (characterised using the Work-life Interference sub-index of the Australian Work And Life Index) were (marginally) more likely to have an overweight or obese child; this appeared to be most relevant to families in the highest SES group. Arguably, structural solutions are needed to address parents' problematic work schedules and work-life balance. There is a role for government, employers, employees and wider society in rectifying these aspects of current work environments.

The division of responsibilities in families and attitudes towards gender roles was analysed for two parent families. The sharing of domestic tasks was significantly associated with child weight status: where fathers did much less than their fair share children were most likely to be overweight/obese. There was evidence that this contributed to childhood overweight/obesity specifically in families where mothers held a TAFE qualification. A similar trend (not statistically significant) was observed for sharing of childrearing tasks. There was some indication that where partners were strongly encouraging or strongly disciplining around child food choices and eating behaviours, children were less likely to be overweight or obese. Overall, the extent to which mothers endorsed traditional gender stereotypes or supported transcending stereotypes was measured using the Social Roles Questionnaire. Analyses showed that mother's gender role beliefs were not significantly associated with childhood overweight/obesity. However, mothers with the highest SES did not endorse traditional gender stereotypes to the same extent as other mothers and there was some indication that this reduced the likelihood of childhood overweight/obesity. Addressing the imbalance in parents' responsibilities and roles would reduce the 'double-shift' undertaken by mothers and, potentially, its impact on childhood overweight/obesity. Challenging the policies and structures (such as the gender-pay gap) that reinforce traditional gender stereotypes for mothers and fathers is difficult, but would be necessary to achieve change on a broad scale.

The findings of the thesis do not provide major insights about the excess of childhood obesity in the most disadvantaged families in society. Nevertheless, they point to potential benefits for all families of family-friendly work schedules, satisfactory work-life balance and improved gender equity in fulfilling family responsibilities. Public health advocacy and initiatives around these matters is warranted for many reasons, not least the health of the children.

## Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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Stephanie Louise Emma Champion

Date: .....

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# Chapter 1: Introduction

## ***1.1 Introduction and thesis overview***

Obesity in children has increased rapidly in Western countries over the past three decades. Current estimates are that 5-6% of Australian children aged 8-9 years are obese and a further 17% are overweight (Freeman et al., 2011). Childhood obesity is a major public health issue because it contributes to immediate health and psychosocial problems in children, and may be associated with an increased risk of adult obesity and associated chronic disease, and restricted life opportunities. These issues are described in the first part of Chapter 1.

Obesity also represents an inequality in health, as it is now clear that, in Western countries, it is most common in the most disadvantaged groups in society. That is the focus of the second part of Chapter 1. Characterising the spectrum of advantage suggests generic pathways through which socio-economic status (SES) can affect health. More specific models are needed to understand how the prevalence of childhood obesity, in particular, has come to be socially patterned. However, a well developed model of this sort is not available in existing literature.

To date, some of the strongest theorising about the socio-economic gradient in childhood obesity has been undertaken by qualitative researchers. This body of literature is reviewed in Chapter 2. Consideration of this literature led to a focus on three aspects of family life: food-related parenting beliefs and practices; parental work patterns; and gender roles within families. Each of these domains is shaped by broader ideologies and structural arrangements, to which consideration is given in Chapter 2, as befits a public health perspective.

A survey was undertaken to investigate the extent to which the three aspects of family life were associated with obesity and overweight in children and whether this contributed to the social patterning of child overweight/obesity. Methods are presented in Chapter 3. Characteristics of the study sample are outlined in Chapter 4, and analyses concerning each aspect of family life in Chapters 5, 6 and 7, respectively. Finally, the research and its implications are discussed in Chapter 8.

## ***1.2 The public health issue of child overweight and obesity***

Childhood obesity is a major public health issue for many reasons. Children who are overweight or obese (defined formally in the next section) are at increased risk of a variety of immediate health and psychosocial problems, as outlined below, which can also affect long-term health and life opportunities.

Furthermore, these children are more likely than their peers to follow a trajectory of obesity into adulthood with ensuing increased risk of chronic disease in later life (Reilly and Kelly, 2010).

Short-term physical health problems for overweight and obese children (summarised by Han, Lawlor and Kimm, 2010,) include musculoskeletal problems and sleep disorders. At the extreme, children can experience hepatic and renal complications. In addition, early onset of Type 2 diabetes, previously only seen in adults, has been reported (Daniel, 2009). Sexual maturity may occur at a relatively young age (which can create social problems). There is some evidence that damage to organs and systems persists, so that even when children who have been overweight or obese improve their weight status they may continue to have metabolic and other problems (e.g. Deckelbaum and Williams, 2001; Janssen et al., 2005).

Social and psychological problems experienced by overweight and obese children (summarised by Adam and Rieger, 2012) include poor self-image, low self-esteem, social isolation and depression. Overweight and obese children are more likely than other children to be targeted by bullies (e.g. Franklin et al., 2006; Zeller, Reiter-Purtill and Ramey, 2008) and to be treated differently from other children their age by adults (Puhl, Heuer and Brownell, 2010).

Childhood overweight and obesity has been found to have an ongoing negative impact on life opportunities. Long-term consequences of adolescent obesity include: fewer years of schooling, higher rates of poverty and reduced earnings in adulthood (Clarke et al., 2010), lower likelihood of completing university level qualifications (Fowler-Brown et al., 2009), and greater risk of never having been employed by age 30 (Viner and Cole, 2005). For girls, childhood obesity that persists into adulthood has been associated with a decreased likelihood of establishing committed partnerships in early to mid adulthood (Gortmaker et al., 1993; Viner and Cole, 2005).

Overweight and obese children are more likely than their peers to be overweight or obese as adults (e.g. Power, Lake and Cole, 1997; Whitaker et al., 1998; Magarey et al., 2003; Biro and Wien, 2010). In turn, obese adults have an increased risk of many severe and chronic health problems which both decrease quality of life and shorten lifespan (WHO, 2000).

### **1.3 Definition and measurement of obesity**

The World Health Organization (2006: 1) defines obesity as “...*abnormal or excessive fat accumulation that may impair health*”. The most common proxy measure of body composition is the Body Mass Index (BMI) which reflects weight-for-height and is calculated as weight (in kilograms) divided by the square of height (in metres).

The BMI, originally named the Quetelet Index, was developed in 1832 by Belgian mathematician Adolphe Quetelet in order to define the characteristics of the 'normal' man (Eknayan, 2008). The Quetelet Index was first used to measure individual health in the early part of the 20<sup>th</sup> century, by insurance companies as a means of predicting likely health outcomes (Singer-Vine, 2009). The term 'Body Mass Index' was coined by Keys et al. (1972), who compared several indices of relative weight and height and found BMI to be the most accurate anthropometric (i.e. based on body measurements) estimate of body fat percentage compared to assessments made using more intrusive processes. BMI has become the most widespread indicator of fatness of children, adolescents and adults, partly due to the ease with which the component measures (weight and height) can be obtained (Burkhauser and Cawley, 2008; Daniels, 2009).

The World Health Organization (WHO) (1995: 329) provided cut-points for BMI that are used to classify adults (aged 18 years and over) as underweight, normal, overweight, or obese. Normal weight adults have a BMI between 18.5 and less than 25 kg/m<sup>2</sup>, while individuals are usually classified as underweight if their BMI falls below 18.5 kg/m<sup>2</sup>. Adults with a BMI between 25 and less than 30 kg/m<sup>2</sup> are categorised as overweight. The category of obesity refers to individuals who have a BMI of at least 30 kg/m<sup>2</sup>.

Other anthropometric measures of fatness that are quite often used include waist circumference, hip circumference and skinfold thicknesses. These provide information about the way fat is distributed over the body, with a key interest being whether fat is accumulated centrally (around the abdomen) because there is evidence that this fat pattern is especially harmful to health (e.g. Kissebah et al., 1982; Donahue et al., 1987). However, compared to weight and height, these measurements are more difficult to make reliably (e.g. Brodie, Moscrip and Hutcheon, 1998; Flegal et al., 2009).

A range of more complex methods of assessing fat pattern and body composition exist. (At the tissue-system level, body composition refers to the proportion of the body that is accounted for by fat tissue, muscle, bone, blood and residual matter, WHO 1995: 5.) More complex methods include dual energy x-ray absorptiometry, computerised tomography, and plethysmography (see Hu, 2008). However, these methods are generally time consuming and require expensive equipment, so they are usually reserved for detailed clinical research.

Thus, while there is general agreement among health researchers that BMI is an over-simplified indicator of fatness, BMI remains the standard means of identifying overweight and obesity in populations because it is easy and inexpensive to obtain (Burkhauser and Cawley, 2008). In particular, BMI is widely recommended for assessing fatness in children (e.g. Dietz and Bellizzi, 1999; Cole et al., 2000; Widhalm et al., 2001; Daniels, 2009) although care needs to be taken when using BMI to compare fatness across age groups, as the anthropometric profile of children changes markedly as they grow (Pietrobelli et al., 1998). Such comparisons are facilitated by the age- and sex-specific cut-points for overweight and

obesity in children that have been derived by the International Obesity Task Force (IOTF; Cole et al., 2000), based on an extrapolation from the adult cut-points.

#### **1.4 The prevalence of overweight and obesity in Australian children**

Height and weight data have been collected for more than a century from Australian children by school authorities, paediatricians and others, with the earliest reported measurements dating from 1899. Collectively, these data indicate that child height and weight measurements have increased over the 20<sup>th</sup> century (Olds and Harten, 2001). Trends in child overweight and obesity are somewhat more difficult to assess from previous literature, as the definitions of these states have changed over time (see Guillaume, 1999). Past definitions have often been based on percentiles (e.g. obesity corresponding to a BMI greater than the 95<sup>th</sup> percentile), often without an external reference population, so that obesity was artificially fixed at 5% of the sample.

The oldest set of measurements of Australian children that still exists as data for individuals (rather than published summary statistics) is the Australian Health and Fitness Survey conducted in 1985 which included children aged 7 to 15 years (according to Olds et al., 2001). The availability of the original data has meant that it is possible to retrospectively apply a current definition of obesity (i.e. Cole et al., 2000) and assess recent trends. On this basis, in 1985, 9.7% of boys aged between 7 and 11 years were overweight, and a further 1.5% were obese. For girls aged 7 to 11 years, 11.0% were overweight and 1.9% obese (Magarey et al., 2001). There was a sharp increase in the prevalence of child overweight and obesity between the 1985 Australian Health and Fitness Survey and the 1995 National Nutrition Survey. The National Nutrition Survey showed that 12% of boys aged between 7 and 11 years were overweight and a further 4% were obese. Statistics for girls in the same age group were somewhat higher, with 17% overweight and 6% obese. Based on these two surveys, the estimated prevalence of overweight and obesity among the population of Australian children had increased significantly between 1985 and 1995 (Magarey et al., 2001). The findings of more recent longitudinal studies may indicate that close to an additional 1% of the 5 to 10 year old child population became overweight or obese each year between 1997 and 2004 (Sanigorski et al., 2007). The results of the most recent national child overweight/obesity study, the 2008 wave of the Longitudinal Study of Australian Children (LSAC), indicate that approximately 17% of Australian children aged 8-9 years are overweight and almost 6% are categorised as obese (Fletcher et al., 2011).

A review of recent Australian studies of the prevalence of child overweight and obesity was undertaken as part of this thesis in order to further examine the time trends and to gain a sound understanding of the issues involved in obtaining high quality data. This review is presented in greater detail in Appendix A. Briefly, studies were included if they presented information on representative state or national samples of children, and were undertaken between 1985 and 2011.

An overview of the prevalence estimates of overweight and obesity reported in the reviewed studies is given in Table 1.1. The studies sampled children across a wide range of ages. Where possible, prevalence estimates for the entire study sample as well as for children aged around 8-12 years were included in Table 1.1. If these estimates were not reported, where possible, they were approximated using available data.

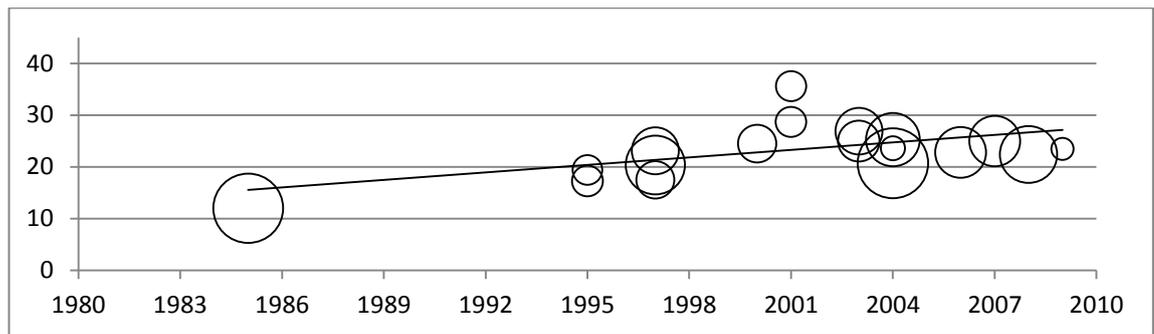
Overall, as expected, the studies showed that the prevalence of overweight and obesity amongst Australian children increased between 1985 and 2011. In the Longitudinal Study of Australian Children, 16.9% of children were overweight at 8-9 years with a further 5.6% obese.

**Table 1.1: Summary of prevalence of overweight and obesity in pre-adolescent children reported in Australian studies, 1985-2011**

Study and date of conduct	First author and year of publication	Study samples which included late childhood size	Age range of sample	Overweight %	Obese %	Combined overweight and obese %
Australian Health and Fitness Survey 1985	Margarey 2001	4,868	7-11 years	10.3	1.7	12.0
National Nutrition Survey 1995	AIHW 2005	954	5-9 y	12.7	5.7	17.3
National Nutrition Survey 1995	Wang 2002	-	7-9 y	15.4	6.1	20.4
National Nutrition Survey 1995	Margarey 2001	887	7-11 years	14.4	5.0	19.4
NSW Schools Fitness and Physical Activity Survey (SFPAS) 1997	Booth 2007	3492	7-12 years	15.8	4.7	20.4
Western Australian Pregnancy Cohort Study (WAPCS) 1997	Burke 2005	1,430	8 years	-	-	17.5
The Health of Young Victorians Study (HOYVS) 1997	Booth 2003	2,221	7-12 years	17.8	5.5	23.2
The Health of Young Victorians Study (HOYVS) 2000	Williams 2005	1,456	9-12 years	20.2	4.3	24.5
Children Living in Active Neighbourhoods (CLAN) 2001	Timperio 2005	919	10-12 years	28.9	6.7	35.6
Children's Leisure Activities Study Survey (CLASS) 2001	Salmon 2001	926	9-13 years	21.6	7.1	28.7
Australian National Iodine Nutrition Study (ANINS) 2003	Li 2007	1,709	8-10 years	18.5	6.5	25.0
Unnamed 2003	Sanigorski 2007	2,184	4-12 years	19.3	7.6	26.9
NSW Schools Physical Activity and Nutrition Survey (SPANS) 2004	Booth 2007	2,874	7-11 years	18.1	7.2	25.3
The Longitudinal Study of Australian Children (LSAC) 2004	Wake 2007a	4,934	4-5 years	15.2	5.5	20.7
Unnamed 2004	O'Dea 2011	583	9-12 years	16.6	7.0	23.6
National Youth Cultures of Eating Study (NYCES) 2006	O'Dea 2007	2,590	6-11 years	16.8	5.9	22.8
The Australian National Children's Nutrition and Physical Activity Survey 2007	Garnett 2011	2,585	7-15 years	17.8	7.1	25.0
The Longitudinal Study of Australian Children (LSAC) 2008	Freeman 2011	3,285	8-9 years	16.9	5.6	22.4
Unnamed 2009	O'Dea 2011	498	9-12 years	18.7	4.8	23.5

The prevalence estimates in Table 1.2 were used to construct a scatterplot of the estimated prevalence of overweight and obesity in pre-adolescent children according to the year in which the respective studies were conducted. The size of the circles in Figure 1.1 reflects the sample size. The solid line on Figure 1.1 indicates the estimated prevalence estimates for the period 1985 to 2011, based on a simple linear regression.

**Figure 1.1: Prevalence of overweight/obesity amongst pre-adolescent Australian children, 1985-2011**



Recently, Olds and colleagues have suggested that the prevalence of child overweight and obesity in Australia has reached a plateau, or increased only slightly, in the last 10 years (Olds et al., 2009; Olds et al., 2010). These researchers provide a number of possible explanations for such a plateau in Australia, including the possibility of a population 'saturation point' in childhood obesity being reached, or the success of public health initiatives.

This phenomenon is not confined to Australia. Many countries have recently reported evidence of a plateau in childhood obesity, including Japan (Rokholm, Baker and Sorensen, 2010), China, New Zealand (Olds et al., 2011), Sweden (Bergstrom and Blomquist, 2009; Lissner et al., 2010), France (Péneau et al., 2009), Switzerland (Aeberli et al., 2010), Greece (Tambalis et al., 2010), and the Netherlands (de Wilde et al., 2009).

In the US, Ogden, Carroll and Flegal (2008) found the prevalence of obesity in children and adolescents had not significantly changed between 1999 and 2006, although Ogden and colleagues (2010) further argued that time trends in the prevalence of high BMI children are disparate across age and sex categories. There is also some evidence from the UK to suggest that the prevalence of childhood overweight/obesity is less stable in economically disadvantaged groups (Stamatakis, Wardle and Cole, 2010).

O'Dea, Nguyen Hoang and Dibley (2011) agree that the prevalence of child overweight and obesity in Australian children has not significantly increased in recent years. However, O'Dea and colleagues (2011) suggest that this levelling may not be uniform across disparate populations of Australian children. A more tempered view of the trend in combined prevalence of overweight and obesity is supported by the present review. Table 1.1 and Figure 1.1 collectively suggest that the trend of increasing child overweight and obesity prevalence persists until 2006 at a minimum, at least for pre-adolescent and adolescent children. It does appear that the prevalence of child overweight and obesity has not increased as dramatically since 1995 as it did between 1985 and 1995, although the flattening of the gradient post-1995 is relatively slight and it must be borne in mind that the pre-1995 estimate is derived from a single study. In any event, Olds et al. (2009) and ODea, Nguyen Hoang and Dibley (2011) consider that, regardless of any plateau, the prevalence of overweight and obesity in Australian children is high by international standards, and certainly higher than desirable.

A number of issues potentially affect the reliability of estimates of child overweight and obesity (as elaborated in Appendix A). For example, 'cluster' sampling has commonly been undertaken, as children are typically grouped (or clustered) in schools (or classes), but it is often unclear whether such clustering has been taken into account when summary statistics were generated. More recently, the escalating public concern about obesity may have contributed to some reluctance of heavier children to participate in (or their parents to provide consent for) studies in which body size is measured (e.g. Dollman and Pilgrim, 2007). If widespread, this could introduce a conservative bias into prevalence estimates.

### **1.5 The socio-economic gradient in obesity**

The 1980 Black Report (Townsend and Davidson, 1988) was the first report of the UK Working Group on Inequalities in Health. The Working Group was established in response to widespread concern that inequalities in health persisted in Britain despite 40 years of operation of the National Health Service. Its mandate was not just to document inequalities, but also to offer explanations. The finding of the Working Group, that much of the problem lay outside of the health system, was not well received. However, the Black Report was important in gradually kindling interest in inequalities in health in many countries. In Australia, two landmark reports were "*Enough to make you sick: how income and environment affect health*" (McClelland, Pirkis and Willcox, 1992) and "*Australia's Health 1992*", the third biennial report of the Australian Institute of Health and Welfare (AIHW, 1992). Those reports showed that, as in the UK, there was a clear and consistent relationship between SES and health, with the most disadvantaged members of society experiencing the worst health and the greatest likelihood of death at any age. (The concept of SES and its assessment is explained in the next section.) This relationship has been found in almost every other country in which relevant data have been examined (Hupalo and Herden, 1999).

Obesity has only recently manifested as another aspect of health inequalities. Historically, the poorest people in society were likely to be undernourished and, consequently, stunted (short) and thin. This has changed in recent decades, as systematic literature reviews demonstrate. Sobal and Stunkard authored a seminal paper in 1989, reviewing 144 published studies that investigated associations between SES and obesity in developed countries. That review established there was a strong and consistent inverse relationship between social position and obesity in women, but findings for men and children were not consistent. A recent review of 45 studies that focused on children was undertaken by Shrewsbury and Wardle (2008), demonstrating that an inverse association between SES and child overweight/obesity was widely reported in developed countries, and was thought to have been present from at least the early 1990s.

Available Australian data support the findings of the review of Shrewsbury and Wardle (2008). For example, in the 2006 National Youth Cultures of Eating Study the combined prevalence of overweight and obesity in children in low SES families was 28%, with the corresponding prevalence estimates for middle and high SES children being 25% and 21%, respectively (O'Dea, 2008). An inverse gradient in the relationship between SES and the prevalence of obesity among children has been demonstrated in several other studies included in Table 1.1 (Booth et al., 2001; O'Dea and Wilson, 2006; O'Dea, 2007; Dollman and Pigrim, 2007; Hardy, 2011; O'Dea, Nguyen Hoang and Dibley, 2011).

As an aside, recent Australian data (in line with that from other developed countries) now support an inverse association between SES and obesity among men as well as women. For example, in the 2001 National Health Survey, 20% of men in the most disadvantaged SES quintile were obese, compared with 13% of men from the most advantaged SES quintile (AIHW, 2003; Burns, 2004). Comparable figures for women were 23% and 12%, respectively (AIHW, 2003). Findings from the AusDiab survey showed that men in the lowest weekly income bracket were 30% more likely to be obese than men in the top income bracket (Cameron et al., 2003).

## **1.6 Concept and attribution of socio-economic status**

Several extensive expositions of the concept and measurement of SES in health research have been published (e.g. Oakes and Rossi, 2003; Braveman et al., 2005; Galobardes, Lynch and Smith, 2007), so it is not proposed to repeat that material. Instead, a summary of the main ideas is offered here, with a focus on critiques of the most common SES measures, in order to guide the analyses presented later in this thesis.

While it is acknowledged that “... *there is still no consensus on a nominal definition of SES nor does a widely accepted SES measurement tool exist*” nevertheless “... *SES is a conceptually useful proxy for*

*describing access to resources and constructing remedies*" (Oakes and Rossi, 2003: 770). Various terms have been used, somewhat interchangeably, in place of SES, including social class and socio-economic position (Braveman et al., 2005; Galobardes, Lynch and Smith, 2007). The different terms reflect different historical and theoretical interpretations of social stratification (Krieger, Williams and Moss, 1997; Lynch and Kaplan, 2000). The term 'socio-economic status' will be used in thesis as it is frequently used in public health research, it avoids the contentious meanings associated with 'class' (Pappas, 1994) and it has been argued to best encapsulate the multi-dimensional concepts of relative status (Braveman et al., 2005).

Traditional indicators of SES include aspects of education, occupation and income (Kunst and Mackenbach, 1994; Grundy and Holt, 2001; Oakes and Rossi, 2003). Location of residence is now also widely used (McCracken, 2001) and composite measures have been developed (see Oaks and Rossi, 2003; Galobardes et al., 2006a; Galobardes, Lynch and Smith, 2007).

While SES indicators often align, there are arguments for different indicators pointing to different causal pathways for impacts on health (Braveman et al., 2005). This has underpinned criticisms of researchers for failing to describe how or why a particular SES indicator was selected (Berkman and Macintyre, 1997).

#### *Educational indicators*

The pathway between education and health is thought to lie primarily in the ability of individuals to use knowledge and skills to respond to health messages and to negotiate appropriate health services (Galobardes et al., 2006b). This includes undertaking a range of health-enhancing self-maintenance activities (Winkleby et al., 1992; Duncan et al., 2002). More broadly, greater educational attainment may indicate greater literacy skills and self-efficacy (Shavers, 2007) as well as investment in improving future situations (Winkleby et al., 1992). However, higher educational attainment often reflects a background of economic advantage and, in turn, is associated with better employment opportunities and higher adult income levels (Kaplan and Keil, 1993; Shavers, 2007). Thus it is deeply enmeshed with other indicators of SES.

Education is a simple, relatively stable indicator of SES (Duncan et al., 2002; Braveman, et al., 2005). It is usually measured as number of years of completed education or as highest educational qualification (Berkman and Macintyre, 1997).

Education is largely free from problems of 'reverse causation', which refers to measures of SES that are themselves a product of an individual's health status (Berkman and Macintyre, 1997; Grundy and Holt, 2001). Education is an especially useful indicator of SES in population segments in which other

measures, such as occupation or income, would lack relevance. This is often the case where people are unemployed, or not in the labour force (including stay-at-home parents, students or retirees) (Braveman et al., 2005; Shavers, 2007).

Education has some recognized limitations as an indicator of SES, however. There have been long-term shifts in societal expectations of educational attainment and in the minimum legal school-leaving age, so education may not be an appropriate indicator of SES in studies where there is a wide range in the age of participants (Berkman and Macintyre, 1997; Galobardes et al., 2006b). Simply counting the number of years of education, or identifying the highest educational qualification held, does not differentiate between more subtle qualities of the acquired education and the status or prestige gained from particular educational sources or qualifications (Lundberg, 2008). In specific population segments characterised by low levels of education, SES measures based on education are unlikely to discriminate sufficiently between individuals or families (Galobardes et al., 2006b; Shavers, 2007).

#### *Occupation-based indicators*

The connections between occupation and health are complex and different researchers have emphasised different aspects or possibilities. Most obvious are the physical hazards that are encountered in certain jobs (Cullen, 2000), with more recent recognition given to the psychosocial demands of jobs and of employment conditions that can also be adverse for health (Marmot et al., 1999; Burgard, Steward and Schwartz, 2003; Warren et al., 2004). On the positive side, occupation can provide a sense of empowerment, perceived relative social status and social integration (Grundy and Holt, 2001; Ansari et al., 2003). Importantly, occupational prestige often means a higher income, and measures of occupation arguably provide a 'structural link' between education and income (Shavers, 2007).

Occupation-based indicators require a classification scheme to be applied to occupations (or job descriptions), and a number of limitations flow from this process. Difficulties in applying classification schemes consistently have been identified (Berkman and Macintyre, 1997). More pertinent, many occupational classification schemes are now out-dated. Traditional measures were developed and validated against historical white male employment experience (McDonough et al., 1999) and many have not been adapted to cover occupations that have recently come into existence, or are disappearing, or which are now dominated by women, with consequent changes in status (Galobardes et al., 2007).

Poor health may contribute to a decline in occupational status, so studies of SES and health that are based on occupational indices may be affected by reverse causation (Duncan et al., 2002). In addition, occupation-based measures do not adequately address the SES of people who are not in the workforce (Krieger, Williams and Moss, 1997; Galobardes, Morabia and Bernstein, 2001; Shavers, 2007). Notable

among this group, in the context of this thesis, are women who are mothers. These women often take time out of the workforce, and many return to jobs that are less demanding than previous work in order to accommodate family responsibilities (Goward, 2005; Walsh, 2007; Webber and Williams 2008).

### *Income indicators*

Pathways between income and health are thought to principally reflect available material resources (e.g. Kaplan and Keil, 1993; Shavers, 2007). Income is arguably 'converted' to health through the ability to create or inhabit environments that enhance health, to pursue a healthier lifestyle and to purchase health services (Galobardes et al., 2006b). However, as mentioned, income is also closely connected to educational background and to occupational conditions and prestige.

Income may be defined in a variety of ways, such as individual current income, household income, 'equivalised income' (adjusted for family size and its associated costs of living) or comparative income (e.g. above or below the poverty line, or compared to certain population benchmarks) (Galobardes et al., 2006b). Compared to education and occupation-based measures, income information is more problematic to obtain, as community members are often sensitive about this information. In surveys, items concerning income frequently have higher non-response than other items, including other SES indicators (Shavers, 2007).

Of all SES indicators, income is the most subject to sudden short-term changes (Galobardes et al., 2006b). Thus income measures can be a poor indicator of overall SES, because income levels fluctuate across the life course (Shavers, 2007), especially for women with children (McDonough et al., 1999). In addition, current income does not usually take into account accumulated wealth or, alternatively, non-monetary support that is not classed as income (Kaplan and Keil, 1993; Berkman and Macintyre, 1997; Braveman et al., 2005). While income may be useful to identify people who are in very constrained economic circumstances, income measures may lack precision in distinguishing between individuals who are not living in poverty (Shavers, 2007).

### *Other indicators of SES*

Composite SES measures that combine several constituent variables into a single summary variable have been in use since the 1950s (see Oakes and Rossi, 2003). For example, Cohen, Doyle and Baum (2006) developed a US scale that combined net income categories with highest level of education.

Such measures are not designed to highlight specific pathways linking socio-economic circumstances and health, but aim to depict the overall degree of advantage or disadvantage of an individual. Few composite

indices have been validated and most require the researchers to make strong assumptions about the homogeneity of study samples (Braveman et al., 2005).

A relatively recent approach in this vein is to derive area-level indicators of SES and apply these measures to all residents within a defined geographical location. In Australia, the Australian Bureau of Statistics (2001) has developed Socio-Economic Indexes for Areas (SEIFA). Variables that reflect area-level income, employment, education, housing and ethnic composition are used in the derivation of four indexes (Walker and Hiller, 2005). While the use of SEIFA indexes “*has come to be the automatic practice in Australian public health research*”, area-level indicators are comparatively crude indicators of SES (McCracken, 2001: 305). The assignment of an individual to an SES group based on their area of residence can lead to the ‘ecological fallacy’, wherein inferences about specific individuals are incorrect. People with similar individual-level socioeconomic characteristics can live in very different areas (Braveman et al., 2005); conversely, very different people in very different socio-economic circumstances may live in the same area, particularly in ‘middle class’ neighbourhoods (Berkman and Macintyre, 1997).

#### *Socio-economic status of families or children*

Assigning SES to families can be problematic. In two parent-families, it is possible that only one parent is in paid work, or that both parents will be in paid work but one (usually the woman) will have an occupation that is less prestigious than the other. Historically, a measure of SES derived from the occupation or income of the ‘head of household’ has been assigned to a family, and this is still a reasonable approach for population sub-groups in which a tradition gender-division of labour is maintained (Galobardes, Morabia and Bernstein, 2001). However, for other families this approach is increasingly questionable. Household income is not necessarily a satisfactory alternative, for reasons mentioned above.

In lone parent families, where the parent is usually a woman, occupation-based indicators may be misleading since, to fulfil caring responsibilities, women may not be part of the paid workforce or may hold jobs below their level of skills and qualifications. Income can be difficult to capture fully if it includes government benefits and child support from the other biological parent (Entwisle and Astone, 1994).

Children are usually attributed the SES of their parents or of the area in which they live, with above-mentioned attendant difficulties. Such attribution is, nevertheless, considered a reasonable approach (Ensminger et al., 2000). Specific indicators of child SES that have been used in some studies of child health include household characteristics, such as whether children have to share a bedroom (Currie et al., 1997), measures of family affluence, such as family car or computer ownership (von Rueden et al., 2006, Currie et al, 2008), and child eligibility for welfare programs (Emory et al., 2008). These indicators tend to

be used when information is obtained from the child but not the parents, as children are often not able to accurately report their parents' education levels, occupations or household income (Currie et al, 2008).

While most of the literature regarding maternal education and child health outcomes focuses on developing countries, higher maternal educational attainment has been associated with improved infant and child health in developed countries (Currie 2009). Currie and Moretti (2003) suggest that better child health outcomes may be associated with the greater use of health care and investments in health, health promoting behaviours, higher earning capacity and greater likelihood of marriage amongst mothers with higher levels of education.

### **1.7 Models for the social determinants of health**

In the last section, the most commonly used indicators of SES were summarised, and the pathways through which health might be influenced by SES were touched upon. This section introduces much more elaborate models that seek to depict the many social determinants of health, including SES. These models inform the focus of this project. A model for cardiovascular disease (a chronic disease for which obesity is an important risk factor) is considered first, followed by several models that aim to depict societal influences on childhood obesity. While each of these models offers a perspective for investigating the associations between the family environment and childhood overweight/obesity, these models do not conceptualise the specific aspects of the family environment that are the focus of this thesis.

Yen and Syme (1999) were some of the earliest epidemiologists to argue for the significance of the impact of the social environment on health behaviours and outcomes, independent of individual risk factors. At the time of their review of the literature, the association between environment and health was poorly understood as the powerful effect of community socio-economic status tended to obscure evidence of the impact of other aspects of the local environment, including discrimination, racial segregation, poor neighbourhood quality and crime, and income inequality. The understanding that there are specific elements of the social environment that have an impact on health was important for the purposes of meaningful public health practice (Yen and Syme, 1999).

Brunner and Marmot. (2005) proposed a model (shown in Figure 1.2) that relates socio-economic inequalities to health outcomes in individuals through material, psychological and behavioural pathways. Social structure is shown as an over-arching influence that acts through these. Roles for work, the social environment, early life factors, genes and culture are also suggested, but are not well integrated in this framework. Nevertheless, the model invokes complexity and makes linkages between some domains. At one level, the model was offered as a general framework for health inequalities. However, it is also clear that a strong motivation was to incorporate stress as part of the pathway to cardiovascular disease. This

explains the emphasis on psychological and behavioural conduits and the (visual) marginalisation of material factors.

Consideration of the model of Brunner and Marmot (2005) draws attention to several matters pertinent to models attempting to depict social determinants of health. First, it is not clear that a universal model can be developed; a model is arguably most coherent and useful when it focuses on a specific health problem and a specific context. Secondly, care needs to be taken as to when linkages are specified or omitted. Thirdly, a balance must be struck between over-simplification and gaining a tool to assist with conceptualisation.

**Figure 1.2: Socio-economic circumstances and health outcomes**

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It is included in the print copy of the thesis  
held by the University of Adelaide Library.

Turning now to the model of Lobstein et al. (2004; Figure 1.3), this was developed for the IOTF as a means of illustrating the wider social and environmental factors contributing to the risk of childhood obesity. The nested ovals show that individual family environments are shaped by greater, over-arching systems. Lobstein et al. (2004) argued that public health interventions designed to reduce the prevalence of childhood obesity must be directed at all layers of the wider environment in order to be effective; failure to make improvements at one level would undermine attempts to make improvements at other levels.

The model of Lobstein et al. (2004) is particularly useful for recognizing that distal factors contribute to obesogenic environments at the level of the individual. However, it does not provide any detail about pathways. Furthermore, the model seems to imply a uni-directional relationship between the distal factors and the child, and appears to fail to recognize that most children are also active, independent agents in

their own environments. While the socialisation provided by parents (labelled family customs and choices) may be most influential for the child, children are influenced by other sources that are not necessarily 'filtered' through the family or directly under parental control. School and peer influences are notable in this regard; partially overlapping ovals might have conveyed this circumstance better than the strictly hierarchical structure.

**Figure 1.3: The opportunities for influencing a child's environment**

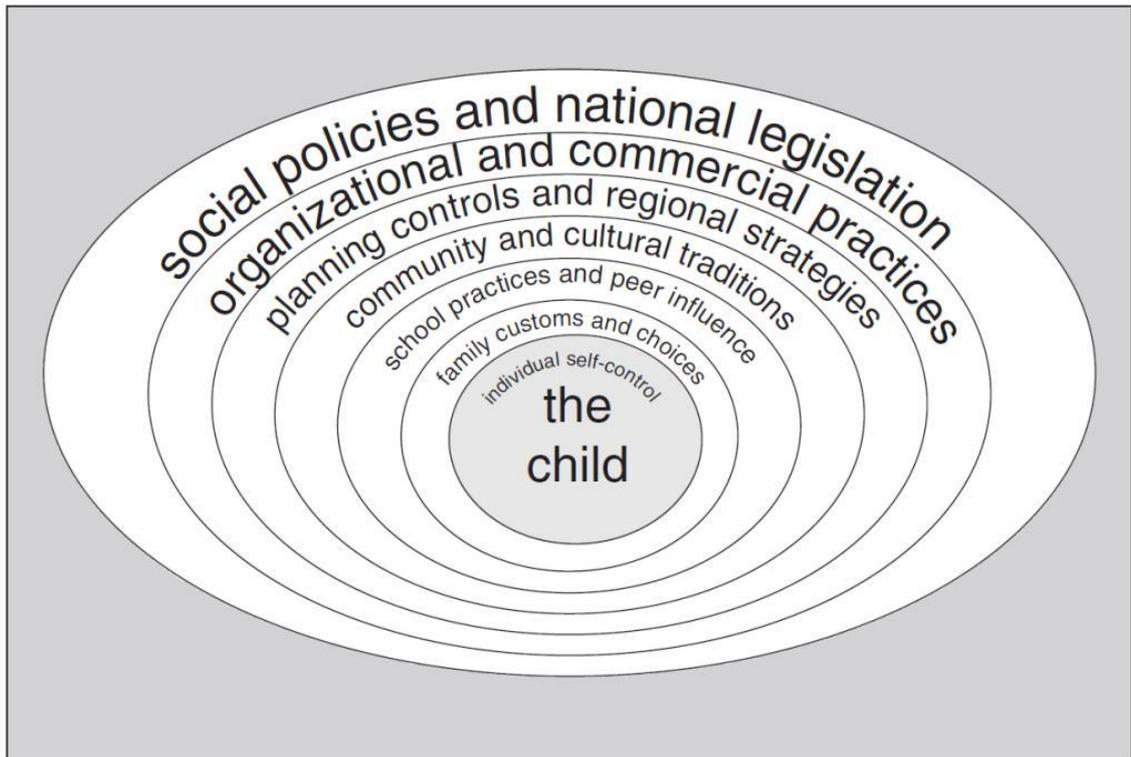
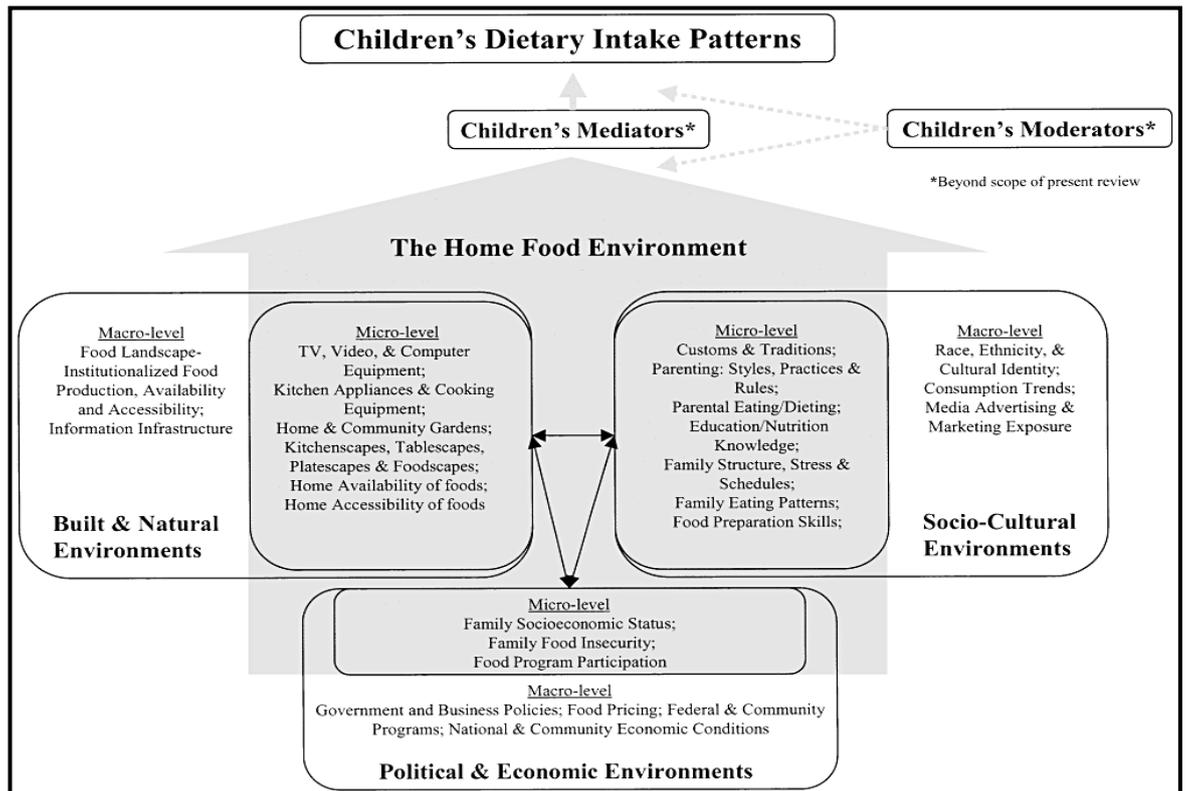




Figure 1.5: The home food environment pertaining to childhood diet



Like the other models presented, the model of Rosenkranz and Dziewaltowski (2008) arguably neglects the bi-directional relationship between children and the home environment; children do not merely respond to environmental influences, they interact with this environment to shape and change it. Rosenkranz and Dziewaltowski (2008) acknowledged that factors within the home environment can be mediated or moderated by aspects individual to each child, but indicated that these factors were beyond the scope of their review. Importantly, the model identifies family SES as a 'micro-level' aspect of the political and economic environment that shapes the family food environment. The model indicates links between this domain and both the socio-cultural and physical environments, but the nature of the relationships are not elaborated.

In summary, available models of the social determinants of childhood obesity prompt some useful thinking about different ways to conceptualize this set of relationships in broad terms. However, there does not appear to be a model that explicitly addresses how SES patterns in childhood obesity arise.

### 1.8 Overall aim of thesis

As seen in Chapter 1, weight-for-height as encapsulated by BMI is an established proxy measure of body composition and there are internationally agreed age- and sex-specific cut-points for classifying children

as overweight or obese. Almost one quarter of Australian children aged 8-9 years are now overweight or obese. While the prevalence of overweight/obesity may have reached a plateau in recent years, it remains unacceptably high.

In Western countries, there is now considerable evidence for a socio-economic gradient in child overweight/obesity, with the prevalence of overweight/obesity highest in children in the most disadvantaged circumstances. Consideration of the concept of SES and widely-used indicators suggests generic pathways for the social determinants of childhood obesity. While a number of frameworks or models depict the range of factors that contribute to the development of obesity, none specifically offers explanations for the social gradient.

Thus, the overall aim of this thesis is to investigate sources of the social distribution of child overweight/obesity, focussing on factors primarily affecting the family food environment.

This aim is first advanced by undertaking a review of literature that describes efforts to theorise in some depth (supported by narrative data) about what is happening in low SES family environments around food (Chapter 2). From this literature three areas are selected for further investigation: food-related parenting beliefs and practices; parental work patterns; and gender roles within families. Literature relevant to these areas is reviewed in Chapter 2 and a set of hypotheses developed (Section 2.5).

Subsequent chapters describe the development and execution of a survey (Chapter 3), sample characteristics (Chapter 4), and analyses relating to the hypotheses (Chapters 5, 6 and 7). Finally, the research and its implications are discussed in Chapter 8.

## **Chapter 2: Towards a deeper understanding of the social patterning of childhood obesity**

### ***2.1 Insights from qualitative literature***

It is clear that there is a socio-economic gradient in child overweight and obesity, in Australia as in other Western countries. However, explanations for this gradient are not clear. Available models (a selection of which were presented in Section 1.7) do not offer detailed explanations, although some linkages are suggested. Australian epidemiological studies were reviewed (see Appendix B) and while many showed that a number of aspects of the family food environment varied with SES, at the time of commencement of this thesis (2006-07) this body of work did not offer well-theorised or contextualised insights. Therefore, to gain a deeper understanding of social determinants of the family food environment, a search of the qualitative literature was undertaken. The aim was to see whether and how researchers had attempted to provide over-arching explanations for the obesogenic aspects of low SES family environments.

Of interest, a review of a similar nature by Pocock et al. (2010) has recently been published. That review considered qualitative research focussing on parental perceptions of healthy behaviours for preventing child overweight/obesity. Broadly the themes identified in that review were: child factors (eating and exercise preferences), family dynamics (modelling, conflict avoidance, use of food to influence behaviour), parenting (knowledge, practices, lack of time, lack of control, motivation, guilt), extra-familial influences (impact of marketing, peers, society, schools and day-care) and resources and environment (affordability and accessibility of food, opportunities for physical activities). Many of the themes identified in the review of Pocock et al. (2010) are similar to those reported here. The review in this chapter goes beyond the themes documented by Pocock et al. (2010) to focus on theories as to why, for example, parents persist in parenting practices they acknowledge are likely contribute to childhood obesity.

At the end of 2007, an extensive literature search was undertaken to identify qualitative studies which addressed the family food environment, in a broad sense, and focussed on low SES groups. Articles were sought from the large literature databases Google Scholar, PubMed, Scopus and Academic Search Premier. Search terms included food, eating, meals, family, parenting, home, low income, qualitative, theory, and variants.

In light of the social context of the Australian families that were to be the focus of the ensuing research project, studies were considered if they were conducted in Australia, the UK or the US, and included original data from parents. Studies were excluded if they: were undertaken outside of the above countries;

primarily included non-white participants; concerned only infants; focussed on eating disorders in parents or children, or health disorders likely to influence child weight/diet.

The purpose of the review was to find publications that had attempted to theorise in some depth (supported by narrative data) about what was happening in low SES family environments around food. A considerable number of qualitative studies were located that merely reported on discussions with parents, often with classification of discussion topics into themes. However, publications that did not go beyond identification of themes in an attempt to offer a higher-order explanation that united themes were set aside. The decision about whether the depth of theorising was sufficient for the research to be considered further was usually taken in consultation with one of the supervisors of this thesis, to try to achieve consistency with a criterion that was hard to define precisely.

Seven relevant studies were thus identified for review (with details presented in Appendix C). The arguments put forward in each of the studies are summarised below (and mapped in Appendix D).

Dobson et al. (1994) identified several food-related practices likely to contribute to childhood obesity and offered over-arching explanations for the occurrence of these practices. In the low income families interviewed, food choices were primarily motivated by a desire to minimise the food budget while maintaining a diet of foods that were filling, unlikely to spoil, and acceptable to husbands and children. While mothers valued nutrition, healthy foods were perceived to be expensive and disliked by family members. A second motivation for food choices was the desire of mothers to minimise the time and energy that must be devoted to providing the family with food. Women - largely responsible for meal preparation and child care - used tasty, convenience meals to minimise both cooking time and effort, and the risk of conflict with children over meals. A third motivation was the sense of social acceptance that could be derived from eating popular foods. For families unable to afford other treats, the purchase of popular snack foods was a means of gratification and re-enforcing a social identity as an active consumer. Socially desirable foods were also seen as an instrument for compensating children for the family's state of poverty. Thus a complex set of motivations stemming from the scarcity of money and time converged to create an obesogenic food environment.

Grieshaber (1997) suggested that parents used meal times as an opportunity to regulate child conduct in accordance with culturally appropriate social behaviours, while children used mealtimes as an opportunity to resist and contest the rule of adults. Mothers, guided by contemporary mothering ideologies and traditional beliefs about gender roles, aimed to teach children 'correct' mealtime behaviours while ensuring reasonable nutrition and preserving a harmonious family environment. In line with intensive mothering ideologies (see Section 2.2.3), mothers granted their children a degree of 'food autonomy'. In doing so, mothers created opportunities for episodes of conflict which were often resolved by submitting to child

food preferences. The gendered division of parenting roles exacerbated parent/child conflict as mothers were often solely responsible and struggled to engage in effective negotiation with children or to enforce mealtime rules. The non-participation of fathers implicitly permitted children (sons in particular) to use conflict to exert influence over their mothers and the family food environment.

According to Hitchman et al. (1994) the main factors underlying food choices in families were economic and time pressures, the gendered nature of domestic tasks and the perceived social unacceptability of some foods/diets. Food purchasing and eating patterns of low income families were principally shaped by a need to keep food costs low while maintaining a diet that was both filling and acceptable to partners and children. While the family food budget was protected as much as possible, meagre incomes meant foods purchased by low SES families were almost entirely inexpensive, value-for-money foods, unlikely to be wasted. Minimising the time and effort that must be devoted to the arduous task of tightly budgeted food purchases and food preparation was a factor in food choices, especially given that mothers were primarily responsible for all aspects of family food provision and childcare. Lastly, the purchase of some foods (such as home brand soft drinks and snacks) was considered by parents and children as a 'badge of poverty'. Some low SES parents sought to prevent a stigma of poverty by purchasing branded foods for children when they were eating meals with peers.

The study by Pugh (2002) did not relate specifically to food choices, but did suggest several explanations as to why parents make the consumption choices they do, which can be extrapolated to explain food choice. Pugh (2002) found that parents purchased goods and services to 'outsource' domestic responsibilities, to define the barrier between family and non-family, to compensate children for perceived deficiencies in the children's lives and to make their children happy. Three theories were offered to unite and explain these behaviours. Firstly, parents may make consumption choices to maintain status via emulation of reference groups. Secondly, parents may demonstrate their caring and capacity as parents via consumption. Thirdly, parents wish to prove their ability to be a good parent via recognition of child individuality and dedication to providing exactly what children want. Contemporary parenting ideologies seem to endorse the belief that 'good' parenting means meeting all of a child's desires, making it difficult to set limits. Refusing to meet the 'needs' of their children or doing things that make their children unhappy could be perceived as evidence of lack of parental care.

The underlying motivation for food choices discussed in the paper by Dixon and Banwell (2007) was parents' desire to consider the food preferences of their children. Parents in this study willingly obliged children's food requests, even at the expense of good nutrition, in order to avoid meal rejection or family conflict. Dixon and Banwell (2007) argue that in contemporary families, children's food preferences are given equal value to those of their parents. This situation is suggested to be a result of interpretations of contemporary ideologies about children's rights combined with ideologies of appropriate mothering,

creating environments in which children can freely select their own diets. Other factors thought to influence family diets included parental time pressure and food cost. Parents, usually mothers, sought to minimise the time spent purchasing and preparing meals and to simplify the challenging task of balancing the food preferences of the family.

Within a much broader study of the cultural meanings attached to food in contemporary Western society, Coveney (2006) analysed interviews with Australian families about food practices. Coveney argues that the interviews show how parents seek to regulate both themselves and their children according to social norms. Coveney draws on the work of Foucault to explain how 'nutrition' can be seen as a discourse, or a tool, that is used by parents to construct their sense of self identity. In this way, parents frame themselves as 'good' or 'bad' parents and 'good' or 'bad' eaters. Parents construct themselves as trying to be ethical, responsible parents at the same time as guiding their children to be ethical, autonomous, 'healthy' citizens. Relevant to SES, Coveney argues that what is seen to be ethical and nutritious is culturally and historically specific. In addition, women approached food provisioning not just through their capacity as mothers, but also through multiple other identities, including that of wife, consumer, worker. Despite women being primarily responsible for food provisioning, they did not control family food choices. Mothers felt pressured to balance their obligation to ensure good child nutrition with parenting ideologies which advocate child food autonomy.

Parents in the two studies reported by Nobel et al. (2007) described several factors that influenced food choices in their families. Mothers in the UK indicated that child food preferences, time pressures, the cost of food, and the desire to avoid mealtime confrontations with children led some to serve their children less than nutritious diets. Parents were disinclined to waste money and effort preparing meals children would not eat, or to spend time arguing with children over food. In the Australian component of the study, mothers described being motivated by a sense of duty and love to ensure their children ate nutritiously but also said that time pressures, feelings of guilt and a desire to avoid conflict with children may contribute to unhealthy food choices. Specifically, Australian mothers spoke of providing children with unhealthy snack foods in order to ensure good behaviour in public, to assuage their guilt about not spending time with children, and to indulge children. For mothers in both countries, a paradox in food provision was apparent, as although ensuring that children eat healthy foods was considered to be an aspect of good parenting, the provision of tasty (but unhealthy) foods as treats or rewards, and not forcing children to eat healthy foods they disliked, were also considered part of good parenting.

In the studies summarised above, a number of inter-related organising themes recur: financial pressures, time pressures, parenting practices, competing priorities, gender roles, compensation, and consumerism and food marketing. The relevance of these pathways for the family food environment in low SES households was considered.

In order to focus the research undertaken for this thesis, three areas were selected for detailed research. They were chosen based on personal interest in the topics, because they appeared to have received relatively little attention, and because they represented a mix of individual-level and structural-level issues as befits a public health perspective. The three areas are food-related parenting beliefs and practices, parental work patterns (as a major source of time pressure) and gender roles; these will be elaborated on in Sections 2.2 to 2.4.

## **2.2 Food-related parenting beliefs and practices and child overweight/obesity**

The qualitative literature suggested that the dominant parenting ideology (or its interpretation and common practice) undermines parents' ability to ensure their children eat healthy foods. A mesh of aspects of this parenting ideology may contribute to child overweight/obesity, especially in low SES households. Parents prioritise child happiness and family harmony above other matters, including child nutrition. Moreover, parents use unhealthy food as a means of preserving family harmony and to reward, indulge or compensate children. Through the provision of foods desired by children, parents demonstrate family ties, love for their children, and willingness to sacrifice for their children. Food is also used as a tool to protect children's self-esteem and to help them fit in socially. In addition, parents want to give their children choices in many aspects of their lives, including food, but often seem to lack the skills, time and energy to steer children towards healthier choices. Allowing children to 'have a say' in their own diets opens avenues for conflict with children, often resolved by parents submitting to children's food preferences. Broadly, these issues coalesce around the dynamics between parents and children, food as currency in those dynamics, and (somewhat separately) parents' difficulties in shaping behaviour around healthy food.

In the subsequent sections (2.2.1 to 2.2.4) the development of the dominant contemporary parenting ideology and practices are described. The ways in which food-related parenting beliefs and practices may contribute to child overweight/obesity in low SES families are explored.

### *2.2.1 Historical ideologies of parenting and the perceived role of children*

Eagleton (1991: 1) describes ideology as a "*production of meanings, signs and values in social life*" and as "*a body of ideas characteristic of a particular social group or class*" through which individuals make sense of the world. Johnston and Swanson (2003) more simply describe ideologies as subjective realities, constructed from a pool of beliefs, ideas, opinions and values, used to create meaning and define what is acceptable and normal. Ideologies can be used to sanction particular roles and behaviours and to marginalise individuals who transgress the boundaries of social expectations legitimised by ideologies.

Thus, through ideologies, dominant cultural groups preserve social uniformity by upholding their own values, beliefs and practices (Johnston and Swanson, 2003).

Parenting ideologies in Western countries have been changing for at least the last 400 years, with some of the most dramatic changes occurring since the 1950s. A range of views about the roles of parents and children have circulated, often co-existing despite conflict between them. A general timeline of understandings of children and childhood follows, while recognizing that ideologies often overlapped in time and co-existed within social strata.

In the Middle Ages there appears to have been no concept of childhood; instead children were regarded as small adults. Not until the 16<sup>th</sup> century were children considered as distinct from adults (Holloway and Valentine, 2005). Until the 18<sup>th</sup> century children were believed to be inherently bad and parents were encouraged to maintain emotional distance from their offspring (Hays, 1996). Beating children to “defeat the devil within” was encouraged (Holloway and Valentine, 2005: 30). In this era children were perceived to hold little value until such point as they became productive family members. Thus while parents cared for their children, the children were little valued before around seven years of age after which they were considered likely to survive (Aries, 1976; Wilson, 1980) and able to contribute to the family economically (Aries, 1976; Zelizer, 2001). The style of parenting then prevalent would now be recognized as ‘authoritarian’, a form a parenting defined by a high level of parental control, high expectations for behaviour of children, strict and consistent discipline with an emphasis on obedience, combined with low parental responsiveness and low child autonomy (Baumrind, 1966, 1997).

Between the 18<sup>th</sup> and mid 19<sup>th</sup> centuries, in Western countries, the nature of views about children changed. Children were re-imagined to be physically fragile, innately innocent (Holloway and Valentine, 2005) and “emotionally priceless” (Zelizer, 2001: 3), partly as a result of 18<sup>th</sup> century philosophers, such as Jean-Jacques Rousseau and John Locke, who advocated for child-orientated childrearing to uncover children’s natural goodness and talents (Koops, 2008; Holloway and Valentine, 2005). These beliefs signal the introduction of ‘modern childhood’ for middle-class families.

Middle-class parents in the 19<sup>th</sup> century could afford to extend the period of child dependence and provide children with education and recreation opportunities (Synnott, 2006). At around this time, living in a ‘nuclear’ family became more common (Kremer-Sadlik and Paugh, 2007). For poorer families who remained reliant on child labour for the household’s income, the economic exploitation of children continued until the late 19<sup>th</sup> century when child labour and compulsory education laws were introduced. By the early 20<sup>th</sup> century, even for working-class families, children had been essentially ‘reconstructed’ to be economically worthless and child labour was shunned (Zelizer, 2001).

From the early 20<sup>th</sup> century, advice from scientific and medical 'childrearing experts' was widely disseminated. Early experts originally promoted a form of highly regimented childrearing designed to address the perceived problem of indulgent parenting (Prusank, 2007; Collins, 2009). Some experts questioned mothers' "instinctive suitability" for the task of parenting, given mothers' tendencies towards over protectiveness and smothering love (Stearns, 2003: 4).

The childrearing methods recommended by experts were time consuming and mothers who could afford to do so were expected to remain in the home and devote their time to parenting (Hays, 1996; Kleinberg, 1999). Middle-class mothers arguably became 'experts' in fulltime mothering to justify their non-economic position in the family (Zelizer, 2001) while working-class mothers struggled to balance employment (for example, taking in washing) and parenting responsibilities (Boris and Lewis, 2006).

After World War II, childrearing experts generally rejected stringent, regimented parenting techniques, instead endorsing 'authoritative' parenting practices. This style of parenting is characterised by warm and attentive interaction between parents and children, with parents providing reasonable, consistent control while granting children age-appropriate autonomy (Berk, 2005).

Spock, Brazel and Leach are experts who each recommended a form of child-centred childrearing which emphasised the power of mothers to shape children's development while at the same time cautioning mothers of the dangers of too much interference (Hays, 1996). Practices previously deemed 'permissive' (e.g. feeding on demand, undivided attention) were adopted by middle-class mothers. Between the 1950s and the 1990s, the child-centred parenting methods recommended by childrearing experts were solidified as best practice (Allan, 1994; Kleinberg, 1999).

### *2.2.2 The changing rights of the child*

Since the Geneva Declaration of the Rights of the Child (developed by the International Save the Children Union) was endorsed by the General Assembly of the League of Nations in 1924, child rights have been progressively advanced by international policies and legislation. In 1924, children were recognised as having the right to healthy physical and spiritual development, adequate food and shelter, protection from exploitation and relief in times of emergency, irrespective of race, nationality or religious beliefs (Robinson, 2002).

The rights of children were further expanded in the 1959 Declaration of the Rights of the Child (DRC) which recognised children's rights as surpassing those of adults. At that time children were granted additional rights to a legally recognised name, adequate education, medical services and opportunities for recreation; a secure, loving and understanding environment free from discrimination; and access to their

biological parents. Children were also protected from engaging in any labour that may be detrimental to their health.

The first binding treaty to protect the rights of children, the United Nation Convention on the Rights of the Child (CRC), was developed in 1989 and ratified by Australia in 1990. Additional rights enshrined in the CRC included the right to legal protection before birth, protection from military recruitment, and the right to special protections in instances of mental or physical disability. Adopted and refugee children were also granted the right to know and access their birth parents, birth country and cultural identity.

An important extension of the rights of children under the CRC was the right of children to express their own views and opinions and have their opinions given “due weight” (reflecting the age and maturity level of the child) in all matters concerning the child (Robinson, 2002: 314). Children were granted freedom of expression, thought and religion, provided this did not present a danger to others. While the rights and responsibilities of parents to guide their children’s choices were recognized, children’s rights to express opinions and views were restricted only by national law, not the preferences of parents. Children’s rights in these regards were elevated to the extent that they were potentially equal to those of adults (Hafen and Hafen, 1996) and surpassed those of parents (Robinson, 2002).

Although the intention of the child rights movement was to address social problems, some saw increasing child rights as contributing to social ills. Prior to the development of the CRC, Hafen, (1977) and Mnookin (1978) expressed fears that liberating children from their parents’ caring regulation could damage the nature of family relationships. Schoeman (1980) argued that supporting child liberation was short sighted and unrealistic considering the biological and economic dependence of children on their parents. By reducing the parent/child relationship to an obligation by parents to meet children’s rights, the tie between parents and their children arguably becomes less intimate and “quasi-contractual” (Schoeman, 1980: 9). Thus, after the ratification of the CRC, the expansion of child rights was contentious as although children were granted special protections in light of their greater vulnerability and dependency, the new rights gave children independence and autonomy equal to that of adults (Woodhouse, 1994). This was problematic for some, because children were thought to lack the knowledge and rational decision-making skills needed to make informed decisions in their own best interests (Hafen and Hafen, 1996).

In response to changing ideals about the role of children (Section 2.2.1) and increasing child rights, the rights of parents to physically discipline their own child have been limited in some countries. While the corporal punishment of children is legal in Australia, it is discouraged (Naylor and Saunders, 2009). Internationally, social acceptance for spanking and even scolding children has decreased since the 1950s (Stearns, 2003).

### 2.2.3 *Authoritative and intensive parenting practices*

As mentioned, a focus on child emotional and psychological well-being developed around the middle of the 20<sup>th</sup> century, along with a parenting style often termed 'authoritative' (Quirke, 2006; Stapleton and Keenan, 2009). This attention to the child's social and intellectual development accelerated in the 1990s, partly due to new knowledge about child brain and social development (Quirke, 2006; Wall, 2010).

Around this time, Hays (1996) described a form of mothering she called 'intensive'. Intensive mothering is a "*child-centred, expert-guided, emotionally absorbing, labour intensive, financially expensive ideology in which mothers are primarily responsible for the nurture and development of the sacred child and in which children's needs take precedence over the individual needs of their mothers*" (Hays, 1996: 8). Thus, this form of parenting is highly child-centred and self-sacrificing (Arendell, 2000). Intensive parents (almost always mothers) are highly responsive, allowing children to guide the process of development with decision-making powers at least as great as those of parents (Dixon and Banwell, 2004). In contrast, authoritative parents are both demanding and responsive, combining high control and parental involvement with age-appropriate freedoms (Baumrind, 1997; Gray and Steinburg, 1999).

It should be noted that mothers are widely believed to be inherently better carers of children than fathers (see Section 2.4). Mothers are therefore expected to take primary responsibility for childrearing (Merskin 2008) and motherhood remains a 'primary identity' for adult women (Arendell, 2000: p1192). As indicated above, the term 'parenting' is often used when 'mothering' is intended (McCant, 1987; Hays, 1996). The 'intensive' mothering described by Hays (1996) is often understood by mothers and childrearing experts to be innate and 'natural' for women (Hays, 1996).

Not all mothers can (or wish to) practice 'intensive' mothering. A more common ideology of 'good' mothering is probably somewhere between authoritative and intensive, and could be termed 'child-centred'. Women who do not practice child-centred parenting are marginalised, even though elements of this form of parenting are widely recognised as unrealistic (Johnson and Swanson, 2006).

As an aside, two variants of intensive mothering have received recent attention. 'New momism' is characterised by three important beliefs: motherhood completes a woman, mothers are naturally children's best caretakers, and children require complete physical, intellectual, emotional and psychological devotion from their mothers to develop into happy, well-adjusted adults (Sutherland, 2010). The 'natural parenting' ideology further extends the responsibilities of mothers, requiring them to be supremely sensitive to their child's emotional and physical needs. Aspects of natural parenting include extended periods of breastfeeding (2-4 years), feeding on demand and extensive carrying and co-sleeping, well into childhood (Schön, 2007).

Although the broad requirements of child-centred mothering appear to be fairly clearly defined, it is also recognized that mothers retain some flexibility, and tend to adopt practices they believe are important while rejecting those deemed unimportant or unachievable. In a study of UK mothers, working mothers were able to rationalise their decision to work while maintaining an intensive mothering identity (Vincent, Ball and Pietikainen, 2004), as did working mothers in US studies (Hays, 1996; Johnston and Swanson, 2006; Sutherland, 2010). Additionally, US working-class mothers, who lacked the material and personal resources required to undertake intensive mothering modified their understanding of children's needs to accommodate their individual situations (Fox, 2001). This flexibility may help to explain why parents who aspire to intensive parenting ideologies do not always use child-centred strategies to manage children's behaviour.

Underlying parenting ideologies should determine the strategies parents use to regulate child behaviours (Dix, Ruble and Zambarano, 1989). However, as will be seen below, the recommended strategies within child-centred parenting require time and patience, which parents do not always possess.

Spock rejected overt discipline techniques (physical punishment) as a means to regulate child behaviour, arguing that if parents developed loving, respectful bonds with their children, the children would want to co-operate with their parents' gentle and friendly instructions (Spock, 1969). Thus, regulation of child behaviour was recommended through negotiation, consistent direction (Hays, 1996) and withdrawal of parental love (Stearns, 2003).

In relation to discipline, more contemporary childrearing experts such as Leach (1994) and Brazelton (1984) support methods of regulating child behaviour that cultivate awareness and self-discipline (such as reasoning with children and reinforcing acceptable behaviours) and reject physical punishment. Echoing Spock, the experts Brazelton and Greenspan (2000: 146) argue that good behaviour in children is best motivated by children's internal desire to please their parents and behaviour modification is best achieved via *"a great deal of empathy and nurturing care"*. Nicholson (2008: 15) states that *"...very few people with any expertise in the area of child development even advocate a gentle smack as an effective method of discipline of children of any age and none appear to espouse more serious physical chastisement"*.

According to Baumrind (1997), children will always require some behavioural regulation, but if properly managed, disciplinary encounters can teach children negotiation skills while ensuring behavioural compliance. However, for discipline methods to be effective, parents need to devote a great deal of care and attention to balance parental demands with children's need to maintain some autonomy.

Recent practical parenting guides, such as that developed by the editors of Parents Magazine (Parents Magazine, 2000), encourage parents to avoid needing to discipline children altogether, by clearly communicating to children what is expected of them, reinforcing positive behaviours and avoiding situations where children are likely to misbehave. When discipline is required, calmly ignoring misbehaviour or 'time-out' are recommended strategies, while bribes and smacking are not (Parents Magazine, 2000).

Greabner (1980) provided an early commentary on how child-centred parenting was undermining discipline, referring to the new approaches as 'laissez-faire'. This theme was later taken up by Valentine (1997a: 45) who suggested that some parents were "relinquishing natural authority" to children in order to preserve happy parent-child relationships.

Parents report responding to difficult child behaviours in a variety of ways, but the use of 'reasoning' appears to have become more common. For example, in a study undertaken in New Zealand, two thirds of parents in the 1990s reporting using reasoning, higher than the prevalence in the 1970s (Richie, 2002). A study of UK mothers, also undertaken in the 1990s, found reasoning was used by 42% of mothers to deal with misbehaviour while 37% of mothers used physical discipline (Thompson et al., 2002).

The use of physical discipline appears to have continued, however. This has been reported in surveys of young parents in New Zealand (Woodward et al., 2007) and parents in Ireland (Bunting, Webb and Healy, 2010). In the Australian context, smacking as a form of discipline was considered appropriate by the majority of individuals who responded to a recent newspaper survey (Nicholson, 2008). Child health nurses from the Western Australian Child Health Service noted that frustrated parents often resorted to smacking when pressured (Larson, 1999).

Time requirement is an implicit feature in the above descriptions of acceptable ways to manage child behaviour. An early commentator (Allan, 1994) noted that the discipline approaches recommended by experts may be difficult to implement in everyday life. Hays (1996) recognized that engaging in negotiation and compromise with children is time consuming and emotionally draining, requiring a great deal more effort than using physical punishment.

Few authors or experts consider what parents should do if they are short of time or patience. The assumption appears to be that good parents have time and endless patience. When parents reject physical punishment, how are they to achieve appropriate child behaviour quickly? Parents left with limited discipline options may be reduced to relying on 'conditional rewards' to regulate child behaviour (Purdy, 1992). According to Stearns (2003), parents can get around the time involved in gaining child co-

operation by lowering expectations of how they want the child to behave; however, the less co-operative children are, the more likely it is that negotiation will be reduced to capitulation on the part of the parents.

Parenting models have been shifting from authoritarian towards liberal permissiveness for much of the 20<sup>th</sup> century. Reaching an ideal balance between these extremes appears to be difficult, particularly in regard to discipline, as parents and childrearing experts are unclear how best to maintain the authority of the parents while fostering a sense of independence and individualism in children (Baumrind, 1997). In relation to healthy eating, this is likely to present particular difficulties for parents. Parents will want to consider children's preferences (which tend to be unhealthy, due to the palatability of energy dense foods) but should balance these preferences with nutritional considerations and, at least sometimes, be able to ignore the demands of children. In addition, parents should be persuading children to eat foods that are healthy, but disliked or unfamiliar. This needs to be achieved while maintaining a harmonious atmosphere, befitting that in which parents guide rather than coerce behaviour. This would seem to require persistence on the part of parents, and the ability to negotiate around disliked or novel foods.

#### *2.2.4 Persistent differences in parenting ideologies and practices across socio-economic groups*

Changes in parenting practices have occurred disparately across classes. Parenting techniques in middle-class families appear to have changed quite systematically between the 1930s and 1960s, from authoritarian to authoritative. Similar changes occurred in working-class families, though less systematic and lagging some years behind the middle-class (Kohn, 1963). Mid 20<sup>th</sup> century middle-class parents sought out and quickly adopted advice from childrearing 'experts', doctors and teachers who emphasised control over parenting quality and child outcomes. In contrast, disempowered working-class parents were more likely to hold onto the regimented parenting practices of the early 20<sup>th</sup> century which better corresponded to their circumstances (Kohn, 1959, 1963, 1989).

The authoritative parenting practices readily adopted by the middle-class permeated into working-class families by various means, including parenting guides and government funded parenting programs. Welfare recipients in particular have been targeted by government parenting programs in an attempt to promote appropriate (child-centred) parenting practices in low SES families in the UK (Gewirtz, 2001) and US (Chase-Lansdale and Pittman, 2002). In Australia, child-centred parenting practices have been promoted via formal parent education programmes (Allan, 1994). Parenting programs provided by the Australian government in the 1960s and 70s endorsed authoritative parenting practices and were designed to guide disadvantaged mothers to engage in child-centred, verbal interaction with children and develop respectful parent-child relationships. Within these programs mothers were encouraged to avoid scolding, begging, or bribing children to behave, but instead, to earn their child's respect and make time together fun, even at the expense of discipline (Karnes, 1970).

From the 1960s to the 1980s, differences between middle- and working-class parenting practices narrowed but remained (Laybourn, 1986). By the 1980s, many working-class parents attempted to adopt child-centred parenting strategies but appeared to struggle with the degree of involvement required, often slipping into permissive parenting practices. Despite this, working-class parenting was generally assumed to be authoritarian and subject to criticism by childrearing experts (Laybourn, 1986).

By the early 1990s, there was evidence that parenting practices were largely similar across social classes in Australia, although mothers of lower educational attainment were still found to be more inclined to use authoritarian parenting strategies (Najman et al., 1994). Recent research by Zervides and Knowles (2007) produced similar findings; low education in Australian parents was associated with authoritarian parenting styles (although that does not mean this was the dominant style). Zervides and Knowles argue that their results are supported by several international studies which have demonstrated a link between low parental education levels and greater use of authoritarian parenting practices.

Internationally, there is inconsistent evidence of class differences in parenting styles in contemporary families. For example, in the US, there is evidence that working-class parents are more authoritarian compared to middle-class parents and working-class parents emphasise child obedience/conformity while middle-class parents emphasise self-direction and skill development (Evans 2004; Lareau, 2002; 2003; Gillies, 2005). In contrast, several studies conducted in the UK (Chan and Koo, 2010) and Canada (Chao and Willms, 2000) found no significant disparity in parenting practices that could be attributed to class differences. Chan and Koo (2010) instead argue that family structure has a greater impact on parenting style, finding single parent families are more permissive and authoritarian and two parent families are more authoritative.

While the association between SES and parenting practices is not clear cut, it is likely that parents across social classes hold differing values motivating their parenting decisions. Gillies (2005) and Lareau (2002; 2003) argue that middle-class parents believe they can mould their children and actively attempt to cultivate children's potential via learning opportunities and child-centred parenting practices. In comparison, working-class parents tend to focus on 'natural' child development, believing that if children are given adequate love, food, and safety, they will flourish without great intervention on the part of the parents.

It is therefore likely that there are still differences in parenting beliefs and practices across SES groups. Authoritarian parenting could persist (as an endorsed ideology) in some low SES families, and remnants of authoritarian practices in others. Even where low SES parents endorse an authoritative ideology, they may not be as adept in practice as other parents, since they are less likely to have experienced this style

of parenting themselves and there is evidence that parents tend to emulate their own parents' childrearing practices (Chase-Lansdale and Pittman, 2002). In the UK, most working-class parents in the mid 1980s raised their children using methods only slightly less strict than those of their parents (Laybourn, 1986). Thus, changes in parenting tend to unfold over generations (although there are exceptions, with a small minority of those who had been harshly parented adopting practices at the other extreme).

There is some evidence of differing parenting beliefs and practices across classes in studies that investigated how parents regulate the behaviour of children in relation to diets. In addition to lower parental control of child diets and snacking, bribing with food treats may be most prevalent among lower income and lower educated parents (Saxton et al., 2009).

### **2.3 Parents' work and child overweight and obesity**

The literature review suggested that time pressure experienced by parents contributes to children being overweight or obese. Broadly, two sources of parental time pressure are conspicuous in the literature. First, time pressure for parents appears, to some extent, to derive from ascribing to a model of parenting that is time intensive. Secondly, in contemporary society it is common for both parents to work, sometimes by choice, but often simply to achieve a reasonable standard of living. Work hours and the demands of work have increased over recent decades, contributing to time pressure for parents.

It should be acknowledged that some researchers have suggested that increased time pressure is an illusion (e.g. Bittman, 2004) and that 'busyness' is the 21<sup>st</sup> century's "badge of honour", a signifier of elevated social status (Gershuny, 2005). This argument rests on analyses of how time is apportioned now, compared to in the past. Thus, for example, it can be demonstrated that leisure time for most adults has probably increased since the 1960s (notwithstanding arguments about a lack of ability to distinguish leisure time from involuntary under-employment or imposed early retirement; Bittman, 2004). Other researchers, such as Goodin et al. (2005) argue that time pressure exists but that it is self-inflicted: adults devote more time to paid and unpaid labour than is strictly necessary to maintain a socially acceptable standard of living.

However, there is considerable evidence that time pressure, especially that stemming from employment, is not an illusion, at least for Australian workers. In 2010, the average Australian fulltime employee worked 40 hours a week (ABS, 2010). However, as Australia has no common statutory limits on work hours, in some industries employees commonly work over 45 hours a week (van Wanrooy and Wilson, 2006). Recent data from the Australian Bureau of Statistics shows that 58% of Australian workers could not alter their start and finish times (ABS, 2009). Even Goodin et al. (2005) acknowledge that work hours are often beyond the control of individual workers.

### *2.3.1 Time pressure arising from sources other than work*

Parents are arguably feeling time pressured as a result of participation in the paid workforce and also because of expectations about parenting and domestic tasks. This section briefly considers pressure arising from sources other than work.

Domestic tasks (excluding parenting) were supposed to become less demanding with the invention of time and labour saving technologies. However, there is limited evidence that these technologies have reduced the time spent on basic household tasks (e.g. washing). At least in Australia, rising standards of housekeeping, pride in the house, and the creation of new household responsibilities (e.g. garden and home maintenance) means that even those in advantaged households continue to spend similar amounts of time on domestic chores as in previous generations (Bittman, Rice and Wajcman, 2004).

Employment commitments mean many families find they have less time available to manage domestic tasks than in the past, when women typically undertook most domestic tasks (Southerton, 2003; de Ruijter and Van der Lippe, 2007). Multi-tasking is one method for compressing time spent on chores but, by intensifying attention and labour, individuals may also increase their feelings of stress and time pressure (Floro and Miles, 2003). Recurrent domestic tasks that lack time flexibility – tasks that simply must be done at particular times, such as preparing and serving meals – can be a particular source of time pressure (de Ruijter and Van der Lippe, 2007).

Rearing children is an enormously time consuming endeavour, equating to as much as 6.5 extra hours a day of unpaid labour in households with children compared to those without (Craig, 2007). Some of this time requirement reflects changes in parenting ideology, with accompanying changes in both the amount and nature of time devoted to children (Kremer-Sadlik and Paugh, 2007).

In the US, and probably Australia, children have become increasingly busy in the past two decades (Anderson and Doherty, 2005). Parents enrol children into extra-curricular activities for a range of reasons, sometimes because there is no supervision available at home (Wyness, 1994; Valentine, 1997), but often for the many positive benefits seen to come from involvement in structured, formal educational and recreational activities (Arendell, 2000; Darrah et al., 2007). However, engaging in such activities takes considerable time and organisation on the part of parents (Daly, 2004). Some parents have indicated that time pressure prevents them from enrolling children in extra-curricular activities (Kirk et al., 1997) and others acknowledge that extra-curricular activities for children can infringe on other family routines and interactions (Crouter and McHale, 2005). Surprisingly, even in families living in disadvantaged areas, child participation in extracurricular activities in Australia is high. An investigation of

the association between extracurricular activities and adolescent self-esteem found that although the proportion of adolescents participating in extracurricular activities was lowest in disadvantaged areas, almost 85% of students surveyed in low SES schools reported that they were involved in at least one structured extracurricular activity (Blomfield and Barber, 2011).

Engagement in extra-curricular activities is just one expectation of an intensive model of parenting. As discussed in Section 2.2.3, many other aspects of contemporary parenting require a lot of time. Parents, especially mothers, remain strongly committed to model of parenting approaching Hay's 'intensive' style, despite the incompatibility with other demands of contemporary life (Hays, 1996). In practice, however, many parents do try to regain some time efficiency. This can take the form of multi-tasking to complete domestic tasks while supervising children (Jacobs and Gerson, 2004; Darrah, 2007; Hilbrecht et al., 2008). Additionally, as discussed previously (Section 2.2.3), some parents resort to bribes in order to gain co-operation by children quickly.

### *2.3.2 Time pressure arising from work and recent changes in work patterns*

Prior to the 1980s, work hours in Australia had been declining and in 1982 most fulltime employees worked a 38 hour week (Strazdins and Loughrey, 2007). By 2010, however, the average number of hours worked by fulltime employees had increased to 40 hours per week, with some occupations averaging work hours of up to 50 hours per week (ABS, 2010).

In Australia, longer work hours have been spurred by an unstable labour market as employees work paid and unpaid overtime and intensify their workloads to remain employed during a time of perceived precarious employment (Allan, O'Donnell and Peetz, 1999). Long and intense hours of work can be a source of considerable time pressure and stress for employees, eroding time for leisure and relationships (Humbert and Lewis, 2008). Overtime hours are even more stressful if "irregular, unpredictable, poorly timed... [or] ...imposed" (Campbell, 2002: 92).

'Task-orientated' jobs, in which production consists of tasks that must be completed within a specified timeframe, are becoming increasingly common in Australia (Williams, Pocock and Skinner, 2008). In comparison to 'time-orientated' jobs, in which employee production is limited to a pre-determined time frame (e.g. 9am – 5pm), task-orientated work schedules can result in individual time pressure as employees are expected to commit the time required to complete the overall objectives, even if this exceeds paid work hours (Peetz et al., 2003; Campbell, 2005; Wanrooy and Wilson, 2006). The pace of work also contributes to a sense of employee 'busyness' and tension. There is evidence that over the last 20 years employees have been required to work harder and faster even in time-orientated jobs (Strazdins and Loughrey, 2007).

Since the 1980s, some employers seeking to minimise expenses have used economic and labour regulation reforms to create smaller and more flexible workforces, often to the detriment of employees (Burgess and Connell, 2005). The introduction of “Work Choices” in 2006 by the Howard government removed many of the employee protections for low skilled workers in relation to wages, work hours, workplace autonomy and job security (Pocock, 2008). The election of the Australian Labor Party in 2007 has resulted in some of the most regressive elements of “Work Choices” being overturned but low skilled, low paid workers remain vulnerable to poor work hours and conditions (Baird, Cooper and Ellem, 2009).

Thus, hours of work have become increasing ‘unsociable’ in some sectors, even if they are not excessive. In this context, the term unsociable means work hours that fall outside the traditional 9am to 5pm weekday hours (Strazdins et al., 2006). Alternative work hours are considered unsocial as they impinge on time that people would generally spend with family or friends (Strazdins et al., 2004). In Australia, as of 2002, 64% of employees frequently worked unsociable work hours (Craig and Powell, 2011). For the under-employed and the ‘working poor’, low rates of pay also contribute to unsocial work hours, as they must work overtime or hold more than one job in order to meet financial needs (Falk, 2001).

Socio-economically, the nature of employment in Australia has become more polarised, but stress is widespread. On one side, educated professionals with high earning potential are expected to work long hours (Goward, 2005) and experience ‘job strain’ due to heavy workloads and, sometimes, job insecurity (D’Souza et al., 2005; D’Souza et al., 2003). On the other side, low paid, low status workers are forced to accept whatever working hours and schedules are offered to them, managing with casual or part-time contracts that lack security (Goward, 2005) and jobs with adverse work conditions (D’Souza et al., 2005). Drago, Tseng and Wooden (2004) call this phenomenon the ‘time divide’, where individuals in some high income groups work longer hours than they would prefer, while many in low income groups work fewer hours than they would prefer.

In addition to longer hours, the requirement to work harder and faster, and unsociable work schedules, there has been an erosion of boundaries between work and private life. This is thought to be in a large part due to the proliferation of technologies such as mobile telephones, home computers and electronic mail (Wajcman, 2008). These technologies have probably improved productivity at work, but also enable work-related tasks to be undertaken from other sites, including the home. The social interactions facilitated by such technologies are also likely to contribute to this blurring of boundaries. Wajcman (2008) refers to employees who are in ‘perpetual contact’ with their work places, while Williams, Pocock and Skinner (2008) refer to this constant accessibility to work as ‘work-life spillover’.

Changes to the nature of work described above also encroach on private life by reducing the quality of non-work time (Boswell and Olson-Buchanan, 2007). Workers bring negative feelings (tiredness, stress, frustration) home with them, which can impact on relationships with family members (Pocock, 2003). The feeling of being constantly connected to work has also been found to reduce the perceived quality of leisure time (Wajcman, 2008).

### 2.3.3 *Working parents*

The majority of parents are employed in paid labour, even in low SES groups. Recent Australian Bureau of Statistics data shows that two thirds of two parent families are dual-income, while 60% of single parents are employed outside the home. Half of mothers of children aged less than five years are engaged in some paid labour (Strazdins et al., 2010).

Contemporary Australian families require two incomes in order to maintain an acceptable standard of living (Bryson and Mackinnon, 2000). Given the current Federal adult minimum wage is less than \$600 per week, a family with dependent children relying on a sole earner drawing minimum wage would end up living well below the Henderson poverty line (Employment Law Centre, 2011). Additionally, in an environment of increased job insecurity, a second income provides protection against financial crises (McDonald, 2001). Government reductions in access to welfare benefits also mean that households need the security of two incomes, particularly when responsible for children (Summers, 2003).

Parents who work are particularly susceptible to time pressure as they must meet parenting responsibilities and paid labour commitments (Bittman, 2004; Broom and Strazdins, 2007, Bianchi and Mattingly, 2004; Jacobs and Gerson, 2004). This can be difficult to achieve, resulting in what has been called 'work-life conflict' (Williams, Pocock and Skinner, 2008).

The model of the 'ideal worker' continues to underpin the culture of work in Australia (Drago, Black and Wooden, 2004). This worker is work oriented, unencumbered, with full access to unpaid family labour (for matters such as meals and housework), able to work overtime, unsocial and inconsistent hours, and able to spontaneously relocate and travel for the purposes of employment (Hook, 2010). This model disadvantages workers with caring responsibilities, in terms of job prospects and career trajectories (Charlesworth and Baird, 2007) and arguably contributes to family time pressure for working parents.

Mothers, in particular, fare badly under expectations of the ideal worker model, which does not accommodate competing commitments, especially any as demanding as childrearing (Gorman and Fritzsche, 2002; Gatrell, 2005; Ridgeway and Correll, 2004; Hays, 1996). This culture persists, even after decades of change in the proportion of women in the workforce and the increasing need for both parents

to work (Pocock 2003). A common solution to the conflicting demands of mothering and employment is for mothers to do part-time or shift work. In Australia, tax offsets for single income families, reductions in family assistance payments and the high costs of child care have also meant that it often makes economic sense for mothers to work part-time (Goward, 2005).

Part-time work is sometimes portrayed to offer the 'best of both worlds', allowing mothers to undertake paid labour and fulfil the mothering role (Walsh, 2007; Webber and Williams, 2008). However, for mothers in high status jobs, working part-time sometimes means falling onto the 'mummy track' where promotion and career development opportunities are limited (Gatrell, 2007), while for mothers in low skilled jobs, part-time work is often unreliable, with unpredictable work schedules (Henly, Shaefer and Waxman, 2006). For the majority of women, part-time work tends to be low-paid and insecure (Goward, 2005). Part-time work (especially if casual) can sometimes mean that work schedules are irregular with limited predictability (Walsh, 2007).

Shift work (especially overnight) is sometimes considered by mothers to be a viable solution to reconciling work and parenting, as mothers can theoretically work while children are asleep. For some, shift work allows mothers to spend time with their children and avoid the costs and inconveniences of child care (Cobb-Clark, Liu and Mitchell, 1999). A strategy utilised by some two parent families is the dual-earner split shift arrangement wherein one parent works during the day, while the other works at night. This practice may allow parents to spend more time with their children, but can be detrimental to family functioning and have negative impacts on the relationship between parents if parents have limited control over their work schedules (Tuttle and Garr, 2012). Low control over shift work schedules is likely to be more common amongst low income workers (Tuttle and Garr, 2012).

#### *2.3.4 The contribution of time pressure to an obesogenic family food environment*

A range of strategies are used by families to save time. These include 'outsourcing' domestic tasks, such as child care, cleaning and laundry (Bittman, Matherson and Meagher, 1999), as well as multi-tasking to manage domestic tasks simultaneously (Southerton, 2007; Wajcman, 2008).

In 1996-97, approximately 20% of Australian couples regularly outsourced domestic tasks (Baxter, Hewitt and Western, 2009). However, the cost involved means this is not an option available to all families (D'Souza et al., 2005). Thus, especially in families where money is tight, time pressure can be difficult to relieve (Broom and Strazdins, 2007). Food is one of the few areas in which time can be saved, from reducing the frequency of shopping, through to limiting time spent on meal preparation and on coaxing children to eat.

Of the many ways in which time can be recovered in the realm of family food, the one that has received most attention is decreased engagement in meal preparation. Alternatives include purchasing partly prepared meals (i.e. some steps have been completed) or basing a meal on convenience foods (e.g. fish fingers, oven chips, pasta sauce from a jar), purchasing fully prepared meals (e.g. at supermarkets or as take-away food), eating at 'fast food' outlets or in low cost restaurants. Bittman (1999) reported that over 90% of Australian households purchased fully prepared meals at least once a fortnight (either take-away or dining out).

There has been a proliferation of alternatives to home cooking in Australia and elsewhere (Bittman, Matheson and Meagher, 1999; Dixon, Hinde and Banwell, 2006). There are concerns about the nutritional quality of food items and meals that are not fully prepared 'from scratch'. Such food items and meals are often energy dense, deceptively high in fats, sugars and salt, and served in excessive portions (Guthrie, Lin and Frazao, 2002; Dixon, Hinde and Banwell, 2006; Banwell, Shipley and Strazdins, 2007).

It has been noted that, in addition to reducing the nutritional quality of the diet, convenience foods can undermine traditional set meal times and facilitate eating 'on the move' and 'around the clock' (Dixon, Hinde and Banwell, 2006). It is also likely that children miss out on opportunities to observe parents modelling healthy food purchasing, preparing and eating behaviours when families rely on pre-prepared foods (Savage, Fisher and Birch, 2007; Campbell et al., 2002).

While use of convenience foods (in many forms and settings) is one of the most easily identifiable ways in which families attempt to relieve time pressure, there are likely to be a myriad of less obvious ways in which the family food environment is compromised to save time. As mentioned in the previous section, parents are widely reported to find mealtimes with children to be a particularly challenging aspect of parenting (Sherry et al., 2004; Dixon and Banwell, 2004; Devine et al., 2006; Noble et al., 2007). Thus, some parents aim to avoid arguments and drawn out meals by providing food that is most likely to appeal to children. Alternatively, co-operation from children may be secured through offering food treats and rewards (Devine et al., 2006; Noble et al., 2007; Brown, Scragg and Quigley, 2008).

### *2.3.5 Evidence that work patterns contribute to an obesogenic family food environment*

In the international literature, there has been some interest in the connection between parental work and aspects of child health and well-being. Historically, the focus was on whether mothers should or should not undertake paid work (e.g. Josselyn and Goldman, 1949). More recently, the focus has shifted toward the nature of mother's employment including the duration and structure of work hours (Moen, 2011), with some recent attention to associations between father's employment and child health and development (Kuhlthau and Perrin, 2001; Ruhm, 2004).

Strazdins et al. (2004) notes that discussions of parental employment and child health still occasionally slip back into discussions of whether mothers should work, rather than focussing on the nature and context of maternal employment. Working fathers and any implications for child health are almost never questioned.

At the commencement of this thesis, there had been relatively limited research investigating parents' work hours or schedules and possible impacts on child health (Vander Ven et al., 2001) and most studies focused on maternal employment only (Varuhas, Fursman and Jacobson, 2003). Studies with significant results had generally found that mothers' long work hours or unsocial work schedules were associated with poorer emotional and behavioural outcomes (Strazdin et al., 2004) and cognitive outcomes (Brooks-Gunn, Han and Waldfogel, 2002; Hill et al., 2005; Rhum, 2004) for children. Mothers' work hours and work schedules had also been shown to impact on the well-being of children by limiting time available for family interaction (Crouter and McHale, 2005), contributing to family conflict and poor parent-child relationships (Davis, Crouter and McHale, 2006).

A few studies had considered child overweight/obesity as an outcome (Johnson et al., 1992; Takahashi et al., 1999; Anderson, Butcher and Levine, 2003; Classen and Hokayem, 2005). The study by Anderson, Butcher and Levine (2003), the only of these studies to consider school aged children with significant results, found evidence of a positive association with long maternal work hours, moderated by SES, so that effects were more pronounced in the most advantaged families.

More recently, several studies have investigated potential associations between parental work hours and child overweight/obesity. Maternal work hours, in particular, have been a focus, and there is further evidence of a positive association between work hours and the risk of child overweight/obesity (Phipps, Lethbridge and Burton, 2006; Zhu, 2007; Miller and Han, 2008; Hawkins, Cole and Law, 2008; Chia, 2008; Ruhm, 2008; Fertig, Glomm and Tchernis, 2009; Courtemanche, 2009). In contrast, there appears to be little or no association between either paternal hours of paid work (Courtemanche, 2007; Hawkins, Cole and Law, 2008; Courtemanche, 2009) or combined parental work hours (Phipp, Lethbridge and Burton, 2006) and child overweight/obesity.

There has been limited investigation of the relationship between unsociable work schedules and overweight/obesity in children. One study of adolescents reported a positive association between maternal non-standard work schedules and overweight in adolescents (Miller and Han, 2008).

## **2.4 *Biologically defined roles versus socially constructed roles for men and women***

The idea that men and women have innate, unalterable, sex-specific characteristics that reflect underlying biological differences is known as 'biological essentialism'. From this perspective, it is 'natural' and inevitable that men and women will fulfil prescribed roles in relationships, family and society (Gelman and Taylor, 2000). In general, women are viewed as emotional and caring, naturally suited to home-making and nurturing children, whereas men are viewed as ambitious and assertive, and thus naturally suited to the competitive environment of the paid workforce (Kite, Deaux and Haines, 2008).

In contrast to biological essentialism, it has been argued that the roles allocated to men and women are socially constructed, and that the distinct attributes that men and women supposedly have are also socially produced. These arguments were made in various ways by second-wave feminists in the 1970s and advanced through the then new discipline of gender studies (Nicholson, 1994; Harrison, 2006). The term 'gender' is intended to encapsulate the idea that roles for (and relations between) men and women are not fixed, but are socially created and subject to change (West and Zimmerman, 1987).

Thus, while there is no doubt that there are biological differences between men and women, the existence of distinct traits possessed by men and women has been challenged (e.g. Lips, 1997; Crompton and Lyonette, 2005). This assumption has been termed 'gender stereotyping' (Kite, Deaux and Haines, 2008). For example, women are typically stereotyped as nurturing, communal (Eagly and Steffen, 1984), sacrificial, patient, kind and sensitive (LeMaster, 2004). This perspective has served to justify women being limited to the domestic realm, with responsibility for providing care to children and others (LeMaster, 2004; Kite, Deaux and Haines, 2008).

Until recently, biological essentialism and gender stereotyping has pervaded economic and employment policies in Western countries (Gelman and Taylore, 2000). For example, until at least the 1950s, many women were expected to leave the workforce after marriage or childbearing (Barnett, 2004). As a consequence, only 10% of Australian married women were employed in 1950 (Evans and Keeley, 2008). It was also common for employed women to be paid less than men in similar jobs (Carlson, 1996; Pocock, 1999; Pateman, 2000), supported by the concept of the 'family wage' which focused on the pay a man needed to support a family (Sayer et al., 2009).

The dominant view that women's place was in the home has receded greatly since the 1970s. In particular, women in Western countries have gained more education and have accessed jobs that have traditionally been almost exclusively held by men. However, the presence of women attending university and in the workforce does not automatically mean that gender stereotypes have been abolished. This will be explored in the next section.

#### 2.4.1 Gender stereotyping of women persists

Despite women now occupying a wider range of roles in society, gender stereotyping persists. In the workforce, this means, for example, that women who are assertive are judged harshly, as unfeminine (Martin, 2008). The 'glass ceiling' which refers to women reaching invisible and inexplicable limits to their careers, while male peers go on to greater successes, in part reflects gender stereotypes about women's (lack of) ability to perform in very powerful roles (Hoobler, Wayne and Lemmon, 2009; Vinkenburg et al., 2011).

For women who are mothers, employment has become more socially acceptable (Neuhaus, 2001). However, a 2001 survey found that half of Australians believed that preschool aged children would be adversely affected by maternal employment, while two thirds believed that mothers with young children should ideally not work. In particular, maternal employment was thought to impair a mother's ability to teach children values, develop emotional ties and *"erodes the level of energy needed for good discipline"* (Evans and Kelley, 2002: 42).

Childrearing experts perpetuate the view that mothers should be the primary caregiver for children (Hays, 1997) even though their language and thinking has shifted to give a greater role to fathers, reflected in widespread use of the terms 'parents' and 'parenting' (Craig, 2006; Sunderland, 2006). This position appears to represent a compromise, in which biological essentialism is relaxed, but only to a degree. The freedom granted to contemporary mothers is limited: while they are encouraged to seek work outside the home, this is only acceptable if their maternal responsibilities are still met (Blair-Loy, 2003). Craig (2007b: 4) argues that the contemporary 'glorification' of the role of motherhood promotes female oppression and supports the ongoing power disparity between the sexes, bluntly stating that *"to achieve gender equality, women should not have children."*

It has been claimed that some Australian women feel that feminism has deceived them into believing they need careers, as well as babies, in order to be happy - when in reality most women would be more satisfied if they maintained traditional gender roles (Campo 2009, 2009a). These arguments align with those of Hakim (1995), who gave the label the 'feminism myth' to the idea that all mothers want to work. Hakim has argued that more than half of all mothers (in the UK) desire fulltime mothering and appreciate low status, low paid jobs that allow them to focus on their mothering role. Furthermore, according to Hakim's (2003a) survey research, the majority of mothers would prefer to have limited or no work obligations, if they could afford to and if they would not be judged negatively for this choice.

It is important to note that many Australian government policies continue to support a male breadwinner model of family (Broomhill and Shart, 2007). Welfare and tax incentives introduced under the Howard government arguably “*blatantly favoured mothers who stay at home with their children*” (Bloodworth, 2004: 1) while families that adopt a more egalitarian division of paid and unpaid labour are penalised (Drago, Tseng and Wooden, 2004). For example, Summers (2003) estimated that a single wage family with a household income of \$70,000 per annum could expect to receive \$2,400 more in government benefits and tax offsets than a dual wage family with the same income. Mendes (2009) and Cooke (2010) recently noted that economic incentives for families, such as the “Baby Bonus” and “Family Tax Benefits”, are most generous for single earner families, irrespective of total family income. The reduction of financial benefits for dual income families and the provision of extra benefits for single earner families have been justified on the grounds that such policies give mothers the freedom to leave fulltime employment if they wish (Campo, 2009a).

Beyond government policies, other macro-structures in society continue to reinforce gender stereotypes. For example, the high cost and limited availability of quality childcare in Australia inhibits the ability of mothers to maintain employment (Kalb, 2009). Many religious organizations strongly adhere to traditional gender stereotypes (Morgan and Scanzoni, 1987; Peek, Lowe and Williams, 1990) and this often resonates with the popular societal belief that children need maternal care to thrive, so mothers should stay home with children at least until they reach school age (Craig, 2007). Additionally, gender segregation of occupations persists in Australia, as in many Western societies. Traditionally masculine occupations such as construction, mining, and engineering are still considered more suitable for men than for women (Andrew, 2009; Lucas and Steimel, 2009; Jassen and Backes-Gellner, 2011). Jobs traditionally considered suitable for women are those in which women continue to be widely employed (e.g. nursing, childcare, cleaning). These jobs tend to be located at the lower end of the occupational hierarchy (Pateman, 2000; Wallace, 2000) and are often lower paid than equivalently skilled professions dominated by men (Pocock, 1999; Wallace, 2000; Bloodworth, 2004).

In Australia, women’s labour market participation has been steadily climbing since the 1950s (Evans and Kelley, 2008). In 2006, 52% of mothers with a child younger than 4 years and 71% of mothers with their youngest child aged between 5-9 years were employed (ABS, 2008). Women’s involvement in the paid labour force invites the view that men need to undertake more of the domestic load (Hertz, 2004). However, as detailed in the next section, women’s increased labour market participation has not resulted in a corresponding increase in men’s domestic responsibilities. In fact, in families where both parents worked a similar number of paid hours, women retain greater responsibility for domestic labour, on average an hour more each day than their partners, even without considering additional time spent supervising children (ABS, 1999).

#### 2.4.2 *Masculinity, fatherhood and socio-economic status*

A biological essentialist view of men focuses on their 'intrinsic' qualities of ambition, competitiveness, self-confidence and independence, and how this makes men best suited to paid employment rather than participating in domestic tasks or parenting (Kite, Deaux and Haines, 2008). Australia has a particularly strong history of upholding myths about men who are physically strong, unemotional, participating in a world of 'mates' and not involved with things that women do (Pease, 2001; Coad, 2002; Butera, 2008; Coles, 2008).

Relatively recently, socially acceptable forms of masculinity have broadened somewhat. For example, it is now more acceptable for men to care about their personal appearance (Hall and Gough, 2011), to contribute in domestic and parenting realms (White, 1994; Adams and Coltrane, 2005) or to be homosexual (Anderson, 2011). However, 'metro-sexual' men are predominantly middle-class, with this wider range of masculinities tied to high status, white collar jobs and economic success. It has been argued that this is an active attempt by these men to differentiate themselves from working-class men (Lupton et al., 1997; Barber, 2008).

Working-class men are thought to experience more pressure to conform to traditional stereotypes of masculinity than other men, and to have fewer opportunities to express other forms of masculinity. Thus, working-class men demonstrate (or 'perform') masculinity through exhibiting physical strength, dexterity at manual skills, maintaining mateship and articulating superiority over women (Coles, 2008; Connell 2005).

Fatherhood is a particular role that is profoundly shaped by understandings of how men should behave. In the Australian context, McMahon (1998) described increasing support for the 'new father', a father who engages with children and participates in domestic labour equally with the mother. However, McMahon maintained that this form of fatherhood rarely occurred in practice. Other early commentators on the acceptability and promotion of the idea of fathers having more involvement in parenting suggested that this was self-serving rhetoric to ensure women's subjugation, with little change in men's actual behaviours (Hertz 1986, Messner 1993).

In Australia at the start of the 21<sup>st</sup> century, changing ideologies of fatherhood had not translated to more fathers having equal (or greater) responsibility for parenting; equal contributions appeared to be limited to 1-2% of families (Russel et al., 1999). Whitehead and Barrett (2001) argue that many men are caught up in restricted gender roles and lack socially acceptable opportunities to be more involved and supportive fathers, although these authors acknowledge that many men choose to remain 'locked' into advantageous expressions of traditional masculinity. In a survey of time use within families, fathers were generally spending more time with children than historically (Craig, 2006). Compared to mothers, however, the time

fathers devoted to childcare was more likely to be spent playing, talking or participating in recreational activities with children, and less likely to be spent feeding, cleaning or supervising children. Fathers also retained the power to pick and choose the tasks they wish to take on, and even when they would be involved. The responsibility for planning and organizing task division remained the role of mothers.

Men behaving in ways that represent a departure from traditional expressions of masculinity may be an option for middle-class men, but this is far less likely to be possible for men from low SES backgrounds (Connell, 2000, 2005; Walker, 1997). Few studies have focused directly on variations in fathering across social classes, and the studies that have examined this topic have inconsistent findings (Braun, Vincent and Ball, 2011). It is possible that inconsistencies arise because middle-class fathers support an active fathering role more often than they practice it (Henwood and Procter, 2003; Plantin, 2007; Braun, Vincent and Ball, 2011).

'New fatherhood' is thought to be a middle-class phenomenon (Lupton and Barclay, 1997; D'Enbeau, Buzzanell and Duckworth, 2010). A study of Swedish fathers found evidence of greater involvement with children amongst middle-class fathers than amongst working-class (Plantin, 2007). A time use study of US fathers also showed that men with higher levels of education spent more time with their children (Yeung et al., 2001). In comparison, low income and working-class fathers are thought to be ill-positioned to practise involved fathering (D'Enbeau, Buzzanell and Duckworth, 2010) as, while many fathers define good fathering by their ability to provide financially for their family, economic provisioning has particular salience for working-class fathers (Christiansen and Palkovitz, 2001). A UK study reported that working-class men maintain a more traditional fathering role and feel ill-equipped to be involved with children's learning and cognitive development, but due to economic factors, unemployed working-class men might be forced to care for children while mothers worked (Gillies, 2009). Thus, more time spent by some fathers with children does not necessarily represent a choice by men to be more involved fathers or a change in their gender role beliefs (Deutsch and Saxon, 1998; Hart and Kelley, 2006).

Connell (2005) argues that it is especially important for low SES men to hold on to traditional forms of masculinity (including limited interest in parenting). As men from disadvantaged backgrounds are now less able to derive a sense of masculinity from their occupations, as a result of insecure employment or undesirable (unskilled, powerless) jobs, overt domination of wives and maintenance of traditional gender roles is one way for men to preserve a sense of masculine privilege. In emphasising their status in the home, low SES men are often supported by class solidarity and widespread support for traditional gender roles in low SES communities (Pyke, 1996; Connell, 2005). Additionally, Allen and Hawkins (1999) have argued that some women highly value their mothering identity, and are thus hesitant to surrender responsibility for caring to partners, irrespective of competing commitments. Working-class women may be particularly reluctant to share control over a role they feel is rightly theirs and which validates their

motherhood status (Duncan, 2005; Meteryer and Perry-Jenkins, 2010) or if they perceive their partner to be a less skilled parent (Fagan and Barnett, 2003).

It is likely that feminist values, or simply a more relaxed approach to gender stereotyping that is not designated feminist, may have permeated Western societies unevenly, across class and other lines. Second-wave feminism (in its most highly recognised form) was a middle-class phenomenon (Whelehan, 1995; Mann and Huffman, 2005) so it is likely that more middle-class families have a history of practising relaxed gender stereotypes (in relation to parenting and other life domains) compared to low SES families.

In the 1970s, middle-class feminists wanted equality in legal matters, education and career opportunities, greater employee rights (Williams, 1997; Baxandall and Gordon, 2002) and equality in relationships (Moran, 2004). Women from disadvantaged backgrounds were far less visible in feminist activism or endorsing feminist agendas. Recently, Luxton (2001) and Campso (2009a), focussing on Canada and Australia, respectively, have argued that working-class feminism nevertheless occurred, at a similar time to middle-class feminism. However, the concerns were different, with working-class feminists focussing on achieving employment equality and improving working conditions.

Working-class women arguably have remained more traditional and conservative compared to middle-class women (Thompson and Walker, 1989, Deutsch and Saxon, 1998; Braun, Vincent and Ball, 2008) and place greater importance on their mothering role than their worker role (Braun, Vincent and Ball, 2008). In a study by Archer, Halsall and Hollingworth (2007), disadvantaged young women in London were found to aspire to the position of wife, mother and low status labour, partly because they perceived few alternative life opportunities. In Australia, there appears to be no direct evidence of differential gender stereotyping across socio-economic groups. However, Holton, Fisher and Rowe (2009) found that unemployed women and women with only high school education held more traditional attitudes towards women's roles and motherhood compared with employed or tertiary educated women. This finding complements research undertaken in 1996 (McDonald, 1997) and 2001 (De Vaus, 2002) which showed that women without tertiary education and lower income families had more children than tertiary educated women and higher income families.

#### *2.4.3 Traditional gender stereotypes and obesogenic family food environments*

As previously noted, the feminist movement and the increased prevalence of women in the workforce have not necessarily resulted in more egalitarian gender role beliefs and practices in families. Although it is apparent that fathers have gradually increased participation in managing housework and parenting tasks, most contemporary mothers have retained primary responsibility for this labour, irrespective of their employment status (Pilcher, 2000).

Men's willingness to share, and actual participation, in domestic labour and childcare is likely to be greater in middle-class families (Warren, 2003; Duncan, 2005). In working-class families, mothers may be more likely to persevere with the unequal division of domestic labour and caring for several reasons. Mothers may lack the authority to compel partners to take on equal responsibility for domestic and caring tasks (Geist, 2005) or may avoid asking partners for help managing domestic responsibilities to preserve relationship harmony (Kluwer, Heesink, Van De Vliert, 1997). Alternatively, they may have lower expectations for partners' participation in domestic tasks (Perry-Jenkins and Folk, 1994) or hold traditional gender role values that mean they would prefer to maintain control over the domestic sphere (Braun, Vincent and Ball, 2008; Meteryer and Perry-Jenkins, 2010). As a result, in low SES families, mothers are least likely to be supported by partners in managing the family food environment, from shopping, to meal preparation, to coaxing children to eat foods they dislike.

The gender divide in roles and responsibilities within families is inter-related with the two domains considered previously, parenting and work schedules. Fox (2001) argues that parenthood increases gender inequalities in families and this is exacerbated by time intensive parenting ideologies which emphasise the relative importance of mothering over fathering. Low income mothers may be driven to simplify their parenting strategies because they lack supportive partners (Fox, 2001; Hagelskampa et al., 2011), potentially by using unhealthy foods to encourage good child behaviour (Nobel et al., 2007) and maintain harmonious family interaction (Dobson et al., 1994; Burrige and Barker, 2009). Additionally, Ashley et al. (2004) and Green et al. (2009) have suggested the provision of family meals is a means through which mothers can validate their caring role and reaffirm domestic and intimate relationships between family members. Low income mothers may be particularly vulnerable to using food to express care and to comfort children as they lack the economic means to express their love in other ways (Gillies, 2006).

Work schedules can also compound problems arising from gender role stereotypes. The expectation that mothers should be primarily responsible for the care of children, solely on the basis of their gender, is problematic given that many mothers are employed outside the home. This may be a particular issue for low income mothers who are frequently employed in jobs characterised by low employee power and family unfriendly work schedules. For low income families, inequalities in the division of domestic labour and childcare responsibilities and family unfriendly work schedules may lead to mothers using unhealthy foods to make parenting tasks less time intensive. For example, serving children only foods they enjoy makes parenting tasks more expedient (and more harmonious) but requires compromising ideal nutrition (Coveney, 2006; Nobel et al., 2007).

## **2.5 Hypotheses addressed in this thesis**

A relatively small body of literature provides theoretical insights as to what might be occurring in low SES families that makes child overweight/obesity most common in such families. From the recurrent organising explanations, three were selected for investigation in this thesis: food-related parenting beliefs and practices; parental work patterns; and gender roles within families.

For each of these foci, detailed consideration was given in this chapter to historical changes in Western society, the likelihood of current socio-economic differentials, and possible pathways to child overweight and obesity. There appeared to be reasonable grounds for proposing that each of these aspects of family life could contribute to a higher prevalence of overweight/obesity in children in low SES families, compared to other families.

The next step is to see whether or not empirical evidence supports these propositions. In particular, to see whether the following (alternative) hypotheses are supported in a community-based sample of families:

- (1) Food-related parenting beliefs and practices are associated with child overweight and obesity. Specifically, in relation to food, where mothers oblige their children, are less able to influence their children, and are not firm, children will be more likely to be overweight/obese.
- (2) Food-related parenting beliefs and practices differ across SES groups and this partly explains SES differentials in child overweight/obesity.
- (3) Parental work patterns are associated with child overweight and obesity. Specifically, where parents work family-unfriendly schedules and where mothers have poor work-life balance, children will be more likely to be overweight/obese.
- (4) Parental work patterns differ across SES groups and this partly explains SES differentials in child overweight/obesity.
- (5) Gender roles, as reflected in the sharing of family responsibilities between parents and mother's attitudes, are associated with child overweight and obesity. Specifically, where traditional gender role stereotypes are adhered to, children will be more likely to be overweight/obese.
- (6) Gender roles within families differ across SES groups and this partly explains SES differentials in child overweight/obesity.

## Chapter 3: Methods

An existing cohort of mothers and children was interviewed to collect data for the analyses presented in this thesis. This chapter details methods for original recruitment of the Generation 1 cohort and the nature of the 9<sup>th</sup> wave of follow up which was the source of the present data, including a description of the data collection protocols and instruments, derivation of variables, approach to analyses and specific analysis plans, including statistical methods. Note that the results presented in this thesis are based on the first 300 interviews, so that data entry, cleaning and analysis could occur within a time frame compatible with duration of PhD candidature.

### **3.1 *The Generation 1 study***

Between 1998 and 2000, pregnant women were recruited from one public hospital (Lyell McEwin) and three private obstetric practices located in Adelaide to take part in a longitudinal study of child health. The study was originally designed to investigate early life influences on growth and development in children. Additionally, the study sample was recruited with the intention of making comparisons between families from differing socio-economic circumstances, so families were deliberately sourced from contrasting sites for receiving antenatal care, to ensure the spectrum of SES was encompassed.

To be eligible for recruitment into the Generation 1 study, women were required to be Caucasian, aged at least 18 years, and free from pre-existing medical conditions known to seriously affect fetal growth, such as Type 1 diabetes mellitus. Of the eligible women approached to participate in the study, approximately 65% agreed to participate and, of these, 557 women (96%) completed the antenatal questionnaires and measurements and gave birth to a baby that survived the neonatal period (Moore et al., 2004).

In the years that the cohort was recruited, 92-95% of births in South Australia were to Caucasian women, and less than 5% of those births were to women under 18 years (Moore et al., 2004). The sample of mothers and children recruited for the Generation 1 study was similar to the general population of women giving birth in South Australia in 2000 in terms of their age, employment status, education level, household income, and relationship status. The distribution of birth weights for children born in the Generation 1 study was also similar to the distribution of birth weights for the overall population of infants born in South Australia between 1998 and 2000 (Moore et al., 2004).

Since recruitment and baseline interview, mothers (usually) and their children have been followed up on 9

occasions: a second time during pregnancy (with additional information obtained through hospitals at the child's birth), and when the child was aged 3, 6, 9 and 12 months, and at 2, 3½, 5 and 9-10 years of age.

### **3.2 Study design, data collection protocols and instruments**

This thesis concerns a set of cross-sectional analyses of data collected at the 9-10 year wave of follow up in the Generation 1 study. As in previous waves, the biological mother was usually interviewed. However, where the biological mother was no longer caring for the study child, an alternative carer was interviewed. Carers such as stepmothers (no biological relation) and grandmothers of the study child were considered acceptable alternatives to the biological mother provided they took an active role in the care of the study child. As the focus of this thesis is social factors contributing to child overweight and obesity, primary caregiver status surmounted biological relationship. For the purposes of this thesis, all carers will be referred to as the mother.

Mothers who agreed to participate were invited to complete a structured personal interview, as well as several self-complete questionnaires. Interviews were primarily conducted at home for participant convenience, but mothers were also given the option of holding the interview at the Lyell McEwin Hospital or at a University of Adelaide office building. The research assistant completed the maternal interviews and child anthropomorphic measurements within a single appointment.

At the start of the interview, mothers renewed written consent for their participation and that of the child in the study. In recognition of the growing maturity of the children participating in the study, each child in the study was also asked to sign a consent form. Children were invited to have their body size and fat pattern assessed.

#### *3.2.1 Structured interview schedule and self-complete questionnaires*

A structured interview was administered to mothers by a research assistant, referred to as the "9-10 Years Questionnaire". The research assistant asked the mother questions from questionnaire and recorded responses, seeking clarification as required. The questionnaire covered demographic information, health history of the mother and study child, and other information (not used in this thesis) such as housing and childcare arrangements. For this thesis, key information from the 9-10 Years Questionnaire comprised maternal education, relationship status, family type, employment status and work schedules of mothers and partners (as relevant).

Maternal educational attainment had been obtained previously, but could have changed if mothers had completed further study. Thus mothers were again asked about the amount of high school completed and

also whether they had completed Technical and Further Education (TAFE) study or a university degree. Relationship status included response options of married, de facto, separated, divorced, and single; mothers were considered to be partnered if they reported being in a married or de facto relationship (but not if they had an intimate relationship with a person with whom they did not live). Family type concerned the nature of the relationship of parents to children (biological or from new/former relationships). Questions relating to employment are detailed in a separate section below.

Most mothers responded to all questionnaire items. Most mothers also finished the self-complete components while their child was being weighed and measured. However, in some instances the mother retained some self-complete components and was asked to post them to the research team. If these components were not returned, up to three reminders were made. The matter was not pursued further to avoid alienating participants.

#### *Food-related parenting beliefs and practices*

An aim of this study was to investigate the role of specific parenting beliefs and practices in childhood overweight/obesity. These beliefs and practices were expressions of the degree to which mothers believed they could or should shape children's preferences, the extent to which autonomy was granted to children around food and the extent to which certain competing priorities took precedence over ensuring children ate healthily. Although various questionnaires about parent's child-feeding practices and beliefs were available at the time of the study onset, none reflected the specific food-related beliefs and practices thought to be particularly problematic. Therefore, a set of items were designed for inclusion in a self-complete questionnaire.

First an extended set of possible items was created for consideration and modification by an expert panel familiar with the cohort. A decision was made to construct all items as statements to which responses were Likert-scaled with five levels of agreement (anchor points of "strongly agree" and "strongly disagree") or of frequency (anchor points of "almost always" and "never"). The modified set of items was piloted with four low income mothers of school-aged children, chosen because it was important that such mothers could easily understand and respond to the items. These mothers gave feedback on items and identified those that were difficult to understand or poorly worded. The mothers reported that completing two items on the same topic, one negatively and one positively worded, was onerous. Negatively worded items that required disagreement (double negative) were especially confusing. Revisions to the set of items were made to take this feedback into account. Finally, two researchers external to the Generation 1 study but familiar with questionnaire development rated each retained item for transparency and validity and a short list was identified (see below).

**Table 3.1: Ten items to characterise food-related parenting beliefs and practices**

- Keeping my child happy is more important than getting him/her to eat healthy foods.
- Even if I don't think I should, when my child asks for a certain food I give it to him/her.

*Response options: almost always, often, sometimes, rarely and never*

- It is important for parents to keep trying to get children to eat foods they have previously rejected.
- It won't do children any harm to miss a meal if they refuse to eat what I serve.
- Children have their own food likes and dislikes which I cannot change.
- If my child doesn't like what is being served, I make him/her something else.
- I negotiate with my child to get him/her to eat foods he/she dislikes.
- I have methods for getting my child to eat foods he/she doesn't like.
- I am guided by my child's preferences when I am shopping for food.
- When my child demands a particular food I can ignore him/her.

*Response options: strongly agree, agree, neutral, disagree, strongly disagree*

#### *Work patterns of parents and work-life balance of mothers*

As part of the 9-10 Years Questionnaire, mothers were asked about their paid employment and that of their partner (if relevant). The amount of time that mothers and their partners engaged in paid labour during hours traditionally devoted to family time was also captured (see below).

**Table 3.2: 9-10 Years Questionnaire items regarding parents' work patterns**

- Which of the following best describes your current employment status?
- If you have a partner, could you tell us about his current employment status?

*Response options: working full-time, working part-time, unemployed, home duties, student, permanently unable to work / ill, other (please specify)*

- Does your job involve shift work?
- Does this job involve you working after 6pm or overnight?
- Does this job involve you working on weekends?
- Does your partner's job involve shift work?
- Does he work after 6pm or overnight?
- Does his job involve working on weekends?

*Response options: always, often, sometimes, rarely, never*

In addition, mothers who were in paid employment self-completed the Work-life Interference sub-index of the Australian Work And Life Index (AWALI; Pocock, Skinner and Williams, 2008; Skinner and Pocock, 2008). This comprises five items (see Table 3.3) and is designed to assess satisfaction with work-life balance. The five Work-life Interference items are "averaged and standardized" to the sample mean to

produce a score ranging from 0 to 100, where 100 represents the highest level of interference and poorest work-life balance (Skinner and Pisaniello, 2010). This format shows acceptable internal consistency (Cronbach's alpha = 0.82; Skinner and Pisaniello, 2010).

**Table 3.3: Work-life Interference items from the Australian Work And Life Index**

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*Gender roles and partner contributions in domestic setting*

The fairness of the division of domestic and caring labour between parents within two parent families was gauged using the first two items listed in Table 3.4, adopted from the Negotiating the Life course: Gender, Mobility and Career Trajectories study (Baxter, 2002). Two other items concerning the role of partners in shaping child behaviour around food were developed during the process of developing the 10 items on food-related parenting beliefs and practices (described above).

**Table 3.4: Mother's reports of partner contributions in domestic setting**

- Do you feel your partner does his fair share of the domestic tasks?
  - Do you feel your partner does his fair share of childrearing tasks (physical and emotional)?
- Response options: he does much less than his fair share, he does less than his fair share, he does his fair share, he does more than his fair share, he does much more than his fair share*
- My partner takes a role in encouraging children to eat foods they don't like.
  - My partner takes a role in disciplining children at the table.
- Response options: almost always, often, sometimes, rarely, never*

Mothers were also asked to complete the Social Roles Questionnaire (SRQ; Baber and Tucker, 2006). The SRQ uses 13 items to capture individual attitudes towards social roles (see below). The items form two complementary scales, the gender-link scale (8 items) and the gender-transcendence scale (5 items). The gender-link scale measures belief in inherent links between social roles or skills and gender. The gender-transcendence scale measures the extent of belief that social roles transcend gender.

**Table 3.5: The Social Roles Questionnaire items**

<p>Gender-link items</p> <ul style="list-style-type: none"> <li>▪ A father's major responsibility is to provide financially for his children.</li> <li>▪ Men are more sexual than women.</li> <li>▪ Some types of work are just not appropriate for women.</li> <li>▪ Mothers should make most decisions about how children are brought up.</li> <li>▪ Mothers should work only if necessary.</li> <li>▪ Girls should be protected and watched over more than boys.</li> <li>▪ Only some types of work are appropriate for both men and women.</li> <li>▪ For many important jobs, it is better to choose men instead of women.</li> </ul> <p>Gender-transcendence items</p> <ul style="list-style-type: none"> <li>▪ People can be both aggressive and nurturing regardless of sex.</li> <li>▪ People should be treated the same regardless of their sex.</li> <li>▪ The freedom that children are given should be determined by their age and maturity level and not by their sex.</li> <li>▪ Tasks around the house should not be assigned by sex.</li> <li>▪ We should stop thinking about whether people are male or female and focus on other characteristics.</li> </ul> <p><i>Response options: 10 point scale ranging from strongly disagree (1) to strongly agree (10)</i></p>
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### 3.2.2 Physical measurements of children

Each child's barefoot standing height was measured to the nearest millimetre using a portable stadiometer (Invicta Plastics Ltd. Model no. 0955) according to protocols recommended by the WHO (1995). The child was positioned with his or her heels, buttock, back and head against a vertical measure, standing as straight as possible. Two height measurements were recorded for each child. The average of these measurements was used in analyses.

Child's barefoot weight in kilograms was measured with electronic scales (Tanita Body Composition Analyser TBF-300). For children wearing jeans, 1.0 kg of clothing weight was subtracted. Otherwise, 0.5 kg was subtracted to account for light clothing.

### 3.2.3 Sample size

Statistical analyses for this thesis were restricted to the first 300 mother/child pairs interviewed, to facilitate timely completion of this thesis. In order to detect as statistically significant a modest effect size of 0.2 in a contingency table with 4 degrees of freedom (corresponding to a tabulation of two categories of child weight status by four categories of SES), a sample size of 299 would be required (assuming  $\alpha = 0.05$ , power = 0.80, and a Chi-square test of association). For a contingency table with 3 degrees of freedom and other parameters unchanged, the requisite sample size would be 273. A sample of 300 was also adequately powered (i.e., at 0.80) to detect large interaction effects as statistically significant in a logistic regression model. For example, if the probability of overweight/obesity was 0.2, the probability of lower SES was 0.5, and the probability of family-unfriendly work hours was 0.3, then an interaction term with an associated Odds Ratio of 8.5 would be detected as statistically significant (assuming  $\alpha = 0.05$  and power = 0.80; Demidenko 2007, 2008). Thus the analysis data set with 300 mother/child pairs appears to be sufficiently large to investigate the aims of this thesis.

### **3.3 Data entry and management**

Databases for all the questionnaires (administered and self-complete) used in the Generation 1 study were developed using Microsoft Access 2007 by the candidate. They were evaluated for accuracy by a statistician and research nurse.

Data entry was undertaken by the candidate, a data entry clerk and a research nurse. Several approaches to checking the accuracy of data entry were used, as follows.

Overall data cleaning was conducted by a statistician who followed the structured cleaning framework advocated by Van den Broeck et al. (2005). To determine if data entry was accurate the statistician examined the entered data for missing, extreme or contradictory values.

In addition, the data entry of child anthropometric measurements was also checked for accuracy by comparing each child's weight and height measurements at 9-10 years to their weight and height measures at 2 and 3½ years of age. Although some children were found to be smaller or larger at 9-10 years than was expected based on previous data, all values were judged to be acceptable.

To verify the data entry accuracy for the 10 items on food-related parenting beliefs and practices, two researchers familiar with Access 2007 were trained to enter data into the databases and given a random selection (10%) of the completed questionnaires to enter. The concordance of the data entered by the two researchers and the corresponding entry by the data entry personnel was measured using Goodman-Kruskal Gamma (Sheskin, 2007). Perfect concordance was found between data entry by the data entry personnel and the researchers.

### **3.4 Methods of analysis**

#### *3.4.1 Identification of children who were overweight or obese*

BMI was calculated for each study child based on measurements of child weight and height. From these measurements, individual standardised z-scores for each child in the study were calculated using child sex and age (in days) at study interview (derived from date of birth and date of the interview). The 'zanthro' macro in Stata (Vidmar et al., 2004) was used to derive the age- and sex-standardised BMI z-scores. Children were categorised as being normal weight or overweight or obese based on their BMI z-scores using the IOTF method (Cole et al., 2000).

Cole et al. (2007) have more recently suggested that children with a z-BMI of  $-2$  (i.e. at least two standard deviations below the sex- and age-specific mean) could be considered to be thin. This criteria was applied but underweight children were few and were therefore combined with normal weight children in all analyses.

The overweight and obese categories were combined for all analyses. This is common practice in obesity research, although overweight children do not have the same health risk profile as obese children. It reflects the understanding that there is an underlying continuum in fatness and that moderately elevated BMI in childhood is associated with an increased risk of becoming obese in adulthood, with accompanying health problems (e.g. Krebs et al., 2007).

#### *3.4.2 Maternal educational attainment as the indicator of family socio-economic status*

As discussed in Chapter 1 (Section 1.6), a variety of indicators of SES are used in health research. For the analyses presented in this thesis, maternal educational attainment at the time of the 9-10 year interview was selected as the indicator of SES. The review presented in Chapter 1 suggested that this indicator would be more relevant than other indicators for families with relatively young children. In addition, in the systematic review of the association between SES and childhood obesity undertaken by Shrewsbury and Wardle (2008), parental education was the most commonly used indicator of SES and associations were more consistent for parental education, particularly maternal education, than for other indicators of SES.

Maternal educational attainment was categorised as: incomplete high school; high school completed; TAFE completed; university completed. Where mothers had not completed high school but had completed TAFE qualifications, they were included in the "TAFE completed" category.

### 3.4.3 Approach to analyses

The over-arching question addressed in this thesis concerns reasons for social patterning of obesity in children. This question is investigated in three areas of family life: food-related parenting beliefs and practices; parental work patterns and mother's work-life balance; sharing of parental responsibilities and gender roles within families.

For the three research areas, the general approach was as follows.

- (a) First associations between the set of exposure variables capturing the construct of interest and the outcome of child overweight/obesity were examined.
- (b) If an association for a specific exposure variable was observed in (a), then this exposure could be driving social patterns of child overweight/obesity if it was differentially distributed across socio-economic strata. Therefore, associations between the exposure variables and SES (indicated by maternal educational attainment) were examined to see if this was the case.
- (c) Alternatively, an association might be present in certain socio-economic strata but not others, reflecting a pathway to child overweight/obesity that applies to only a subset of families. Therefore, stratified analyses were undertaken. Where possible, logistic regression was also performed to examine interactions between the exposure of interest and SES in relation to child overweight/obesity.

While it is likely that the three areas of family life measured in this project are inter-related, each area was investigated independently. The inter-relationships between these aspects of family life were not investigated in this thesis, due to the sample size and resultant power to detect effects.

Analyses were performed with Stata 10.0 (StataCorp. 2007. Stata Statistical Software: Release 10. College Station, TX: StataCorp LP). Throughout this thesis, alpha was set at 0.05.

### 3.4.4 Comparisons between families interviewed and remainder of cohort

As mentioned, statistical analyses for this thesis were restricted to the first 300 mother/child pairs. Therefore analyses were conducted to identify any differences between the first 300 families interviewed and those who were not included either because they had withdrawn (n=26) or because they were still awaiting tracing and interview while analyses were proceeding (n=231).

Baseline family characteristics used in these comparisons were the mother's age at birth of study child, mother's educational attainment and household income when pregnant, the child's birth order and sex. For continuous, normally distributed variables, Student's independent samples t-tests were used. For

categorical variables, the Chi-square test was used if all expected cell sizes were at least 5; where this condition was not met; Fisher's exact test was used.

#### *3.4.5 Characteristics of interviewed families and child weight status*

Distributions of characteristics of the 300 families interviewed when children reached 9-10 years were examined. Since all variables were categorical, associations between family characteristics and child weight status were examined using the Chi-square test or Fisher's exact test, as appropriate.

#### *3.4.6 Food-related parenting beliefs and practices and child weight status*

Analyses relating food-related parenting beliefs and practices to child overweight/obesity were based on the 10 items presented in Table 3.1. Where responses to any items were missing, the data from both the mother and child dyad was excluded from analyses. Complete responses were obtained from 280 of 300 families.

Responses to each of the 10 items were first graphed so the spread of responses could be inspected. Next the association between each item and child overweight/obesity was assessed using the Chi-square test or Fisher's exact test, as appropriate. Due to the small number of mothers selecting some response options, the response categories at the extremes were combined (i.e. the following were concatenated: strongly agree and agree; strongly disagree and disagree; almost always and often; rarely and never).

This initial analysis does not make full use of the data, partly because of the need to collapse categories, but more importantly because it does not recognize the inter-related nature of the 10 items. Therefore a factor analysis was carried out. In brief, factor analysis identifies sets of closely correlated variables, pointing to latent (underlying) factors (Fabrigar et al., 1999). An exploratory, rather than a confirmatory, factor analysis was undertaken because there was no existing model for grouping the 10 items.

A factor analysis based on the matrix of pairwise Pearson product-moment correlation coefficients between the 10 items was conducted (Costello & Osborne 2005). Factors were extracted by the principal factors method (Fabrigar et al.1999). The scree plot (Cattell 1966) and Kaiser criterion (Kaiser 1960) were used to determine the optimal number of factors. A varimax rotation (Kaiser, 1958) was then performed to derive factors that were uncorrelated in the final solution (i.e. orthogonal). Each factor in the final solution was used to define a corresponding subscale, incorporating only those items with factor loadings greater than 0.5 in the rotated factor solution (Tabachnik & Fidell, 2007). Subscale scores for individual mothers were created by summing responses to retained items.

The distributions of subscale scores for mothers were plotted so that normality could be assessed. The assumption of normality for a given variable's distribution was examined through D'Agostino's K<sup>2</sup> test (D'Agostino, Belanger and D'Agostino, 1990). The K<sup>2</sup> test provides a goodness-of-fit measure of departure from normality based on a variable's skewness and kurtosis. Student's independent samples t-tests were then used to compare subscale scores for mothers of overweight/obese children and normal weight children. Subscale scores for each SES group were compared using one-way analyses of variance or Kruskal-Wallis tests, as appropriate, to see whether scores systematically differed according to SES. Finally, associations between subscale scores and child overweight/obesity were examined within each SES group to address the possibility that an association was present in some groups but not others.

#### *3.4.7 Parents' work patterns, mother's work-life balance, and child weight status*

As mentioned, data regarding mothers' and partners' employment were drawn from the 9-10 Years questionnaire. Any missing responses to these items resulted in exclusion (n=3).

Mothers were permitted to report more than one employment category (see Table 3.2) at interview, such as working part-time and student, but few did so (n=13, 4%). For analysis, mutually exclusive employment categories were created, with women reporting more than one category reclassified according to the circumstance likely to account for the most time away from the family. In addition, the categories of unemployed, home duties, student, and permanently unable to work/ill were combined as "not employed". The same approach was used to create mutually exclusive employment categories for partners.

The frequency with which parents worked family-unfriendly schedules was assessed using six questions (see Table 3.2). There is no fixed definition of non-standard (or family-unfriendly) work hours in the Australian literature. However, non-standard work hours are customarily considered to occur outside of weekday, daylight hours (Ulker, 2006; Craig and Powell, 2011). In this thesis, "family-unfriendly work schedules" refers to hours worked at night, after 6pm weekdays and on weekends. Specifically, mothers or partners who frequently (often/always) worked shifts (days/hours of work change according to a schedule), or after 6pm or overnight, or on weekends were considered to be working family-unfriendly schedules.

Associations between maternal and partner work patterns (employment status and work schedules) and child overweight/obesity were examined. Next associations between this set of exposures and SES (indicated by maternal education) were examined. Finally, associations between this set of exposures and child overweight and obesity were examined within SES groups. Chi-square tests or Fisher's exact tests

were used, as appropriate. This was first undertaken for two parent families and, separately, for lone parent families.

In total, 232 employed mothers (97%) responded to all of the Work-life Interference items. One other mother responded to all but one item in the scale, and the mean of her responses to the other four items was used to impute a value for the missing item. Of six non-responding women, one was on maternity leave, one worked from home, and four worked less than 20 hours a week.

Each mother's Work-life Interference score was calculated by first reversing the first three items, recoding the responses from a 1 to 5 point scale to a 0 to 4 point scale, then summing maternal responses to all five items to create a score ranging between 0 and 20 for each mother. This score was then multiplied by 5 to give a range of 0 to 100 (Pocock, Skinner & Williams, 2007). A histogram was created to check if maternal responses to the Work-life Interference items were normally distributed. Tests of the assumption of normality were based on the skewness and kurtosis of the distribution (D'Agostino, Belanger and D'Agostino, 1990).

Independent samples t-tests were used to compare maternal Work-life Interference scores for child BMI categories. Mother's Work-life Interference scores were then compared across SES groups (indicated by maternal education) using one-way analysis of variance. Finally comparisons between maternal Work-life Interference scores for families with normal weight and those with overweight or obese children were made when stratified by SES. Again, this was first undertaken for two parent families and, separately, for lone parent families.

#### *3.4.8 Sharing of family responsibilities, gender roles and child weight status*

In the 300 families, 262 women (87%) were partnered. However one of these women did not self-complete the two items concerning partner contributions in the domestic setting (Table 3.4), 16 did not complete the "My partner takes a role in encouraging children to eat foods they don't like" item and 15 did not complete the "My partner takes a role in disciplining children at the table" item. (The women who did not complete the discipline item were the same women as those who did not complete the encouragement item.) All available data were used in these analyses.

Responses to the two items on the fairness of sharing of tasks in the domestic setting were collapsed so that partners were classified as doing "at least their fair share", doing "less than their fair share" or doing "much less than their fair share". Responses to the items concerning the role taken by partners in shaping child behaviour around food were collapsed so that partners were classified as "strongly encouraging", "encouraging" or "low or no encouragement" and "strongly disciplining", "disciplining" or "low or no

discipline”, respectively. Associations with child overweight/obesity, with SES, and with child overweight/obesity within SES groups were examined using Chi-square tests or Fisher’s exact tests, as appropriate.

The SRQ was completed by 259 mothers who were partnered. (Of these, 5 partnered mothers responded to all but one item in the SRQ. For each of these mothers, missing responses were replaced with the mean maternal response to other items from the relevant subscale.)

The authors of the SRQ offered little advice as to the best method of analysing data derived from this questionnaire. At the time of conducting analyses, no other researchers had as yet published studies using this tool.

Each mother’s score on the gender-link subscale was calculated by summing the responses to the individual scale items, giving a score between 8 and 80. Scores on the gender-transcendence scale were calculated in the same way, giving each mother a score between 5 and 50 for this scale. As the distributions of the SRQ subscales were not normally distributed, associations with child weight status were examined using Mann-Whitney tests. Differences between SES groups were investigated using a Kruskal-Wallis test. Associations between each subscale and child weight status within SES groups were investigated in stratified analyses and in logistic regressions with interaction terms.

## Chapter 4: Characteristics of the study sample

As described in Chapter 3, this thesis concerns the first 300 families interviewed in the 9-10 year wave of follow up. At the time of analysis, 26 families had withdrawn from the cohort and a further 30 families had declined to participate in the 9-10 year interview but agreed to remain in the cohort. (Thus 201 were still awaiting tracing and interview while these analyses were proceeding.)

Withdrawals, non-participation and limiting analysis to a subset may reduce sample representativeness. Therefore a comparison of the baseline characteristics of the 300 families included in the analyses in this thesis and the 257 not included is provided in Section 4.1. A description of the characteristics of the 300 families included in the analysis, reflecting their circumstances when the study child was age 9-10 years, is presented in Section 4.2. Child overweight and obesity in the sample is described in Section 4.3 and an exploration of relationships between the family characteristics presented in Section 4.2 and child overweight/obesity is also undertaken.

### ***4.1 Comparison between interviewed families and remainder of the cohort***

At the time of the initial recruitment of pregnant women in 1998-2000, the Generation 1 Study sample of mothers was found to be representative of women who gave birth in South Australia during that period in terms of age, education and income (Moore et al., 2004). Data collected during pregnancy and at the birth of the study child were compared to ascertain any differences in key characteristics of the 300 families interviewed at 9-10 years and the remainder of the cohort. The baseline characteristics considered were maternal age, relationship status, educational attainment, weekly gross household income around the time of the study child's birth, study child's sex and birth order.

As shown in Table 4.1, mothers interviewed when children were 9-10 years were, at the time of pregnancy, on average, slightly older and more likely to be wealthy than mothers not interviewed, differences which were statistically significant. There were marginally significant differences in maternal educational attainment and birth order of study child, such that interviewed mothers tended to have achieved a higher level of education than those not interviewed and mothers of children with two or more older siblings were less likely to be in the first 300 interviewed families. There was no statistically significant difference between interviewed and non-interviewed families in terms of child's sex.

**Table 4.1: Summary of key baseline characteristics of families interviewed and not interviewed**

Baseline characteristic	Interviewed when child was 9-10 years (n=300)	Withdrew, declined or not yet interviewed (n=257)	<i>P</i>
	mean (SD)	mean (SD)	
Mean maternal age at study child's birth (years)	30.4 (4.9)	29.2 (5.1)	<0.01 <sup>1</sup>
	n (%)	n (%)	
Mother's level of education (when pregnant)			
High school incomplete	93 (31.0)	95 (37.0)	
High school completed	47 (15.7)	51 (19.8)	
TAFE completed	96 (32.0)	73 (28.4)	
University completed	64 (21.3)	38 (14.8)	0.08 <sup>2</sup>
Household income, gross per week			
\$0-\$399	33 (11.0)	40 (15.7)	
\$400-\$599	50 (16.7)	57 (22.4)	
\$600-\$799	44 (14.7)	48 (18.8)	
\$800-\$999	40 (13.4)	35 (13.7)	
>\$1,000	130 (43.5)	70 (27.5)	
Unknown	2 (0.7)	5 (1.9)	<0.01 <sup>2</sup>
Birth order of study child			
First	111 (37.0)	76 (29.6)	
Second	126 (42.0)	104 (40.5)	
Third	44 (14.7)	50 (19.5)	
Fourth or later	19 (6.3)	27 (10.5)	0.07 <sup>2</sup>
Sex of the study child			
Male	141 (47.0)	133 (51.8)	
Female	159 (53.0)	124 (48.2)	0.26 <sup>2</sup>

1: P-value based on Student's t-test

2: P-value based on Chi-square test

## 4.2 Characteristics of interviewed families

Table 4.2 presents characteristics at the 9-10 year follow up for the 300 families included in this thesis. Interviewed women were categorised by highest level of education achieved by the 9-10 year interview in all subsequent analyses. Over one quarter of the interviewed mothers had not completed high school. More than half of the mothers had completed some form of tertiary education qualification. Of note, 8 women who reported that they had not completed high school in the interview undertaken when they were pregnant with the study child (see Table 4.1) had completed a TAFE qualification by the time the study child was 9-10 years old, a point relevant to subsequent findings.

**Table 4.2: Characteristics of the first 300 interviewed families at the 9-10 year follow up**

At 9-10 year interview	300 interviewed families	
	n	(%)
Mother's educational attainment		
High school not completed	85	(28.3)
High school completed	44	(14.7)
TAFE completed	102	(34.0)
University completed	69	(23.0)
Relationship status		
Married	226	(75.3)
De-facto	36	(12.0)
Separated	16	(5.3)
Divorced	7	(2.3)
Single (never married)	15	(5.0)
Family composition		
Two parents, biological child/ren	223	(74.3)
Two parents, own and/or stepchildren	39	(13.0)
Sole parent, child/ren	38	(12.7)
Number of children in the household		
1	22	(7.3)
2	168	(56.0)
3	76	(25.3)
4 or more	34	(11.3)
Mother's employment status		
Full-time	66	(22.0)
Part-time	173	(57.7)
Student	5	(1.7)
Unemployed	1	(0.3)
Permanently unable to work / ill	3	(1.0)
Home duties	52	(17.3)
Partner's employment status (n=262)		
Full-time	226	(86.9)
Part-time	11	(4.2)
Student	1	(0.4)
Unemployed	5	(1.9)
Permanently unable to work / ill	9	(3.5)
Home duties	8	(3.1)
Not provided	2	(0.8)

Mothers were asked to report their relationship status. The majority lived in a marital or de facto relationship and were considered partnered for the purposes of subsequent analyses. (No distinction was

made between women who had changed partners since baseline and women who remained married to the same partner for the entire period of the study.)

Most families comprised two parents and their biological children. The remaining families were two parent blended families (13%) or sole parent families (13%). Additionally, while almost all study children were cared for by their biological mother, this was not the case in three families. Thus, two of the interviewed women were stepmothers (no biological relation) and one was the maternal grandmother of the study child.

The number of children under the age of 18 living in the family household ranged from zero to 12. Over half of families had two children, while a quarter had three. In the case of the family with no child technically living in the household, the study child legally resided with her biological father but lived next door to her biological mother and the care of the study child was largely shared. For the purposes of all analyses this child is considered to be in a sole parent household with one child.

Thirteen women who endorsed more than one category of maternal employment were reclassified as reported in Section 3.4.6. Almost 80% of mothers were employed outside the home (part-time for three quarters of these women) and a few were students (n=5). Seventeen percent of mothers reported home duties as their primary occupation. As mentioned in 3.4.6, the categories of “student”, “unemployed”, “permanently unable to work or ill” and “home duties” and were combined as “not employed” for subsequent analyses and collectively these accounted for 19% of mothers.

Employment details were obtained for 260 of 262 partners. Over 90% of partners were employed, the great majority full-time. Although 9% of partners were not currently employed, few mothers (n=7, 2%) considered that their partners were performing home duties.

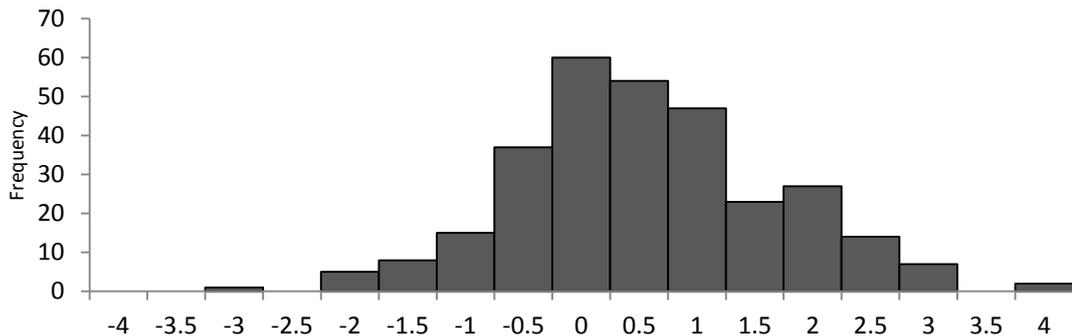
At the time of the interview, the average age of children participating in the study was 9.6 years. The average age of mothers who participated was 41.0 years.

### **4.3 Child weight status**

Cole et al. (2000; for the IOTF) constructed an internationally recognised method for standardising child BMI for children based on an established scale for adults. This method allows researchers to categorise children as normal weight, overweight or obese, adjusting for age in a way that permits comparison of findings across different age groups. The distribution of child BMI z-scores in the study sample is shown in Figure 4.1.

In the sample, 49 children (16.3%) were overweight, and a further 11 children (3.7%) were obese according to the IOTF definition. The child overweight and obese categories were combined for subsequent analyses (n=60, 20%). Using the criteria that children with a z-BMI of less than -2 could be classified as thin (Cole et al., 2007), 7 children (2.3%) children in the study sample were thin. These children were included in the category “normal” for all analyses because of the small number and because BMI is a problematic measure of fat mass in thin children (Cole et al., 2007).

**Figure 4.1: Distribution of child BMI z-scores**



Associations between the family characteristics presented in Table 4.2 (with categories for some variables collapsed to facilitate analyses) and child overweight/obesity are presented in Table 4.3.

Maternal education was associated with child weight status ( $P=0.01$ ). Mothers who had achieved a TAFE qualification were the most likely to have an overweight or obese child: the prevalence of overweight/obesity amongst children of TAFE educated mothers was almost 30%, and half of overweight/obese children had a TAFE educated mother.

There was no statistically significant difference in the prevalence of overweight/obesity among children of partnered and un-partnered mothers. Family composition and number of children in the household were not associated with child weight status. An association between maternal employment status and child overweight/obesity approached statistical significance, with the data suggesting that child overweight/obesity was most common in children whose mothers worked full-time.

**Table 4.3: Child weight status by family characteristics at 9-10 year follow up**

At 9-10 year interview	Normal weight child n (%)	Overweight or Obese child n (%)	<i>P</i>
<b>Mother's educational attainment</b>			
High school not completed	76 (89.4)	9 (10.6)	0.01 <sup>1</sup>
High school completed	34 (77.3)	10 (22.7)	
TAFE completed	72 (70.6)	30 (29.4)	
University completed	58 (84.1)	11 (15.9)	
<b>Relationship status</b>			
Partnered	211 (80.5)	51 (19.5)	0.54 <sup>1</sup>
Un-partnered	29 (76.3)	9 (23.7)	
<b>Family composition</b>			
Two parents, child/ren	181 (81.2)	42 (18.8)	0.69 <sup>1</sup>
Two parents, own and/or stepchildren	30 (76.9)	9 (23.1)	
Sole parent, child/ren	29 (76.3)	9 (23.7)	
<b>Number of children in the household</b>			
1	17 (77.3)	5 (22.7)	0.67 <sup>2</sup>
2	132 (78.6)	36 (21.4)	
3 or more	91 (82.7)	19 (17.3)	
<b>Mother's employment status</b>			
Full-time	47 (71.2)	19 (28.8)	0.11 <sup>1</sup>
Part-time	141 (81.5)	32 (18.5)	
Not employed	52 (85.3)	9 (14.8)	
<b>Partner's employment status (n=260)</b>			
Full-time	180 (79.7)	46 (20.4)	0.36 <sup>2</sup>
Part-time	8 (72.7)	3 (27.3)	
Not employed	21 (91.3)	2 (8.7)	

1: P-value based on Chi-square test

2: P-value based on Fisher's exact

#### 4.4 Summary

This chapter aimed to describe the sample of 300 families used in analyses and to consider sample representativeness. In addition, it provided a description of child BMI and explored differences in the prevalence of child overweight/obesity according to family characteristics.

While the sample available for analyses included families from across the spectrum of socio-economic status (indicated by maternal education at two time points and by household income when the mother was pregnant with the study child), the distributions of these characteristics were not fully aligned with those of the original cohort (and thus of the wider population). This is most important when considering the

prevalence estimates presented in this thesis, which may differ from that of the wider population. It does not necessarily introduce bias into analyses pertaining to each of the three research areas, a point taken up in the Discussion (Chapter 8).

Twenty percent of children in the sample were overweight or obese at 9-10 years. Maternal educational attainment at this time point was the only family characteristic clearly associated with child overweight/obesity. However, there was not a strict gradient in this relationship. Instead, child overweight/obesity was most prevalent in families in which the mother had gained a TAFE qualification. This pattern arguably relates to the nature of TAFE qualifications, another point taken up in the Discussion.

## **Chapter 5: Food-related parenting beliefs and practices and child overweight and obesity**

In this chapter, relationships between food-related parenting beliefs and practices and the outcome of child overweight/obesity are investigated. Briefly, based on the literature review it was argued that contemporary parenting beliefs and practices may lead parents to oblige children's food requests, even when not in the child's nutritional interests. Furthermore, parents may lack the ability to negotiate with children around food or to be firm when denying requests for unhealthy food. The aim of the analyses in the chapter was to determine if endorsement of particular food-related beliefs and practices was associated with child overweight/obesity and whether this helped to explain SES patterns in child overweight/obesity.

### ***5.1 Profiles of food-related parenting beliefs and practices***

As detailed in Section 3.2.1, a set of 10 items to characterise food-related parenting beliefs and practices was developed. The overall purpose of ascertaining mothers' responses to these items was to gauge the degree to which mothers were inclined to allow their child the freedom to make decisions regarding foods eaten, valued child food preferences above nutritional considerations, and felt they were able to successfully negotiate with their child around food.

The 10 items are presented in Table 5.1, grouped according to whether they reflected beliefs or practices. A total of 280 mothers completed all items and this subset formed the basis of subsequent analyses.

**Table 5.1: Ten items to characterise food-related parenting beliefs and practices**

---

Food-related beliefs

1. Keeping my child happy is more important than getting him/her to eat healthy foods<sup>1</sup>
2. It is important for parents to keep trying to get children to eat foods they have previously rejected<sup>1</sup>
3. It won't do children any harm to miss a meal if they refuse to eat what I serve<sup>1</sup>
4. Children have their own food likes and dislikes which I cannot change<sup>1</sup>

Food-related practices

5. Even if I don't think I should, when my child asks for a certain food I give it to him/her<sup>2</sup>
6. If my child doesn't like what is being served, I make him/her something else<sup>1</sup>
7. I negotiate with my child to get him/her to eat foods he/she dislikes<sup>2</sup>
8. I have methods for getting my child to eat foods he/she doesn't like<sup>1</sup>
9. I am guided by my child's preferences when I am shopping for food<sup>1</sup>
10. When my child demands a particular food I can ignore him/her<sup>1</sup>

---

1: Response options: strongly disagree, disagree, neutral, agree, strongly agree

2: Response options: never, rarely, sometimes, often, almost always

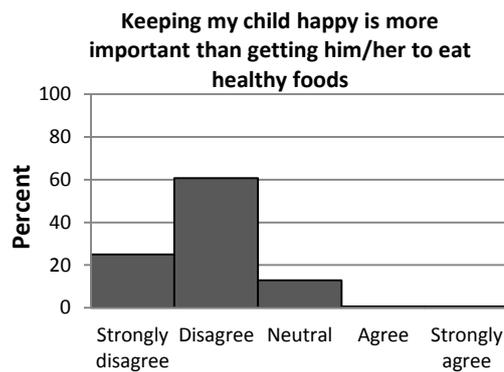
Mothers were asked to report the degree to which they believed that keeping their child happy was more important than ensuring that their child ate healthy foods. Very few mothers (less than 2%) agreed or strongly agreed. The key distinction appeared to be between those who disagreed (61%) and those who strongly disagreed (25%) (Figure 5.1 – Item 1).

The majority of mothers agreed that it is important for parents to persist in getting children to eat foods they have previously rejected. Few mothers (6%) disagreed or strongly disagreed, and the key distinction appeared to be in the strength of agreement (Figure 5.1 – Item 2).

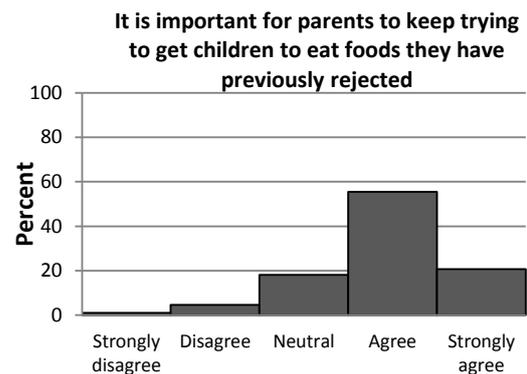
There was a wide spread in responses to the statement that “It won't do children any harm to miss a meal if they refuse to eat what I have served”, with roughly similar proportions of mothers expressing agreement and disagreement and a further 22% neutral (Figure 5.1 – Item 3). Beliefs about whether children's food preferences could be changed also spanned agreement and disagreement, although few mothers endorsed either extreme of the scale (Figure 5.1 – Item 4).

**Figure 5.1: Mother's responses to food-related parenting belief items (n=280)**

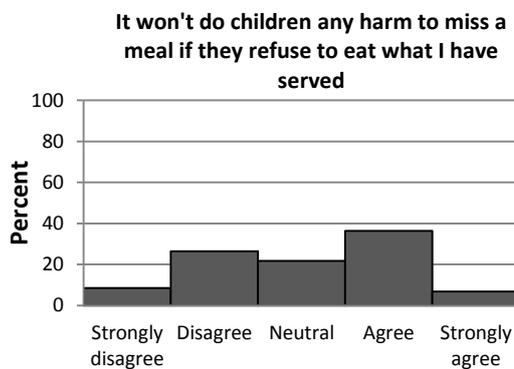
**Item 1**



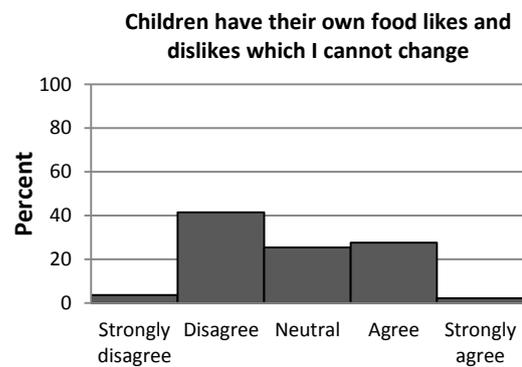
**Item 2**



**Item 3**



**Item 4**



Mothers (53%) most commonly reported that they would sometimes give their child a requested food, even when they didn't think they should, and a substantial proportion (38%) said they would rarely do so. Few mothers reported never, often or almost always doing this (Figure 5.2 – Item 5).

The majority of mothers (63%) disagreed or strongly disagreed that if their child did not like what was being served, they would make something else. A substantial minority of mothers gave a neutral response or agreed (Figure 5.2 – Item 6).

There was a wide spread of responses to the statement “I negotiate with my child to get him/her to eat foods he/she dislikes”. Mothers (37%) most frequently indicated that they sometimes did so. Similar proportions reported often or rarely negotiating around disliked food, and 13% reported that they never did so (Figure 5.2 – Item 7).

Responses to the statement “I have methods for getting my child to eat food he/she doesn't like” were largely limited to the middle of the scale. Half of mothers expressed agreement (48%) and 18% disagreement (Figure 5.2 – Item 8).

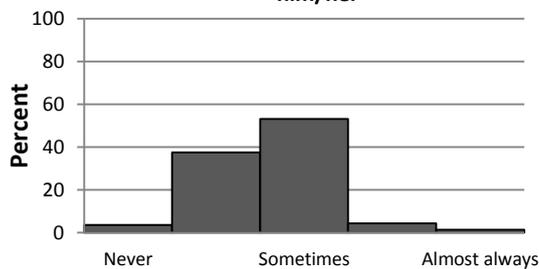
Over a third of mothers (37%) were guided by their child's food preferences when shopping for food, with a similar proportion neutral about this (36%). A substantial minority disagreed or strongly disagreed (27%; Figure 5. 2- Item 9).

The dominant response to "When my child demands a particular food I can ignore him/her" was agreement (54%). Similar proportions of mothers either strongly agreed, were neutral or disagreed. Very few mothers strongly disagreed (Figure 5.2 – Item 10).

**Figure 5.2: Mother's responses to food-related parenting practice items (n=280)**

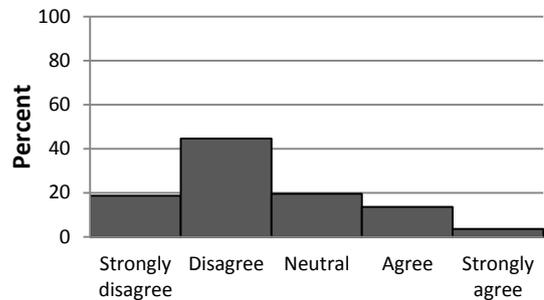
**Item 5**

**Even when I don't think I should, when my child asks for a certain food I give it to him/her**



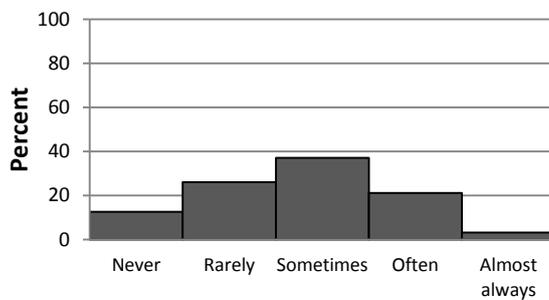
**Item 6**

**If my child doesn't like what is being served, I make him/her something else**



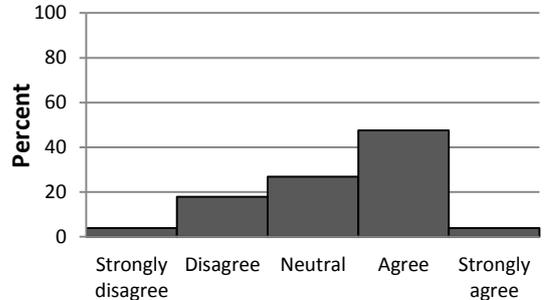
**Item 7**

**I negotiate with my child to get him/her to eat foods he/she dislikes**



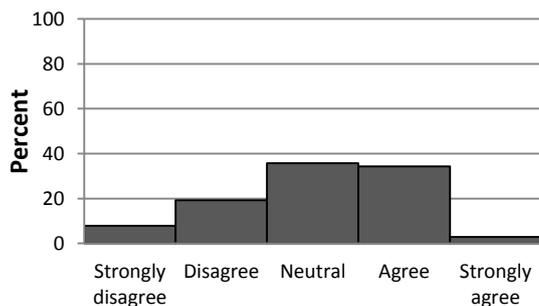
**Item 8**

**I have methods for getting my child to eat foods he/she doesn't like**



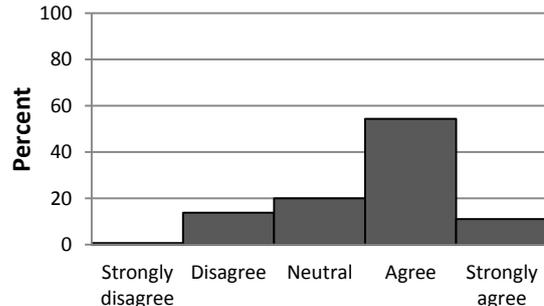
**Item 9**

**I am guided by my child's preferences when I am shopping for food**



**Item 10**

**When my child demands a particular food I can ignore him/her**



## 5.2 Food-related parenting beliefs and practices and child weight status

Associations between specific food-related parenting beliefs and practices and child weight status were examined (Table 5.2). As the number of observations in some of the response categories was small, the five point response scales were collapsed into three categories (disagree / strongly disagree, neutral, strongly agree / agree; and rarely / never, sometimes, almost always / often).

Mothers who agreed or strongly agreed that children have unalterable food preferences were less likely than other mothers to have children who were overweight or obese. There were no other statistically significant associations.

**Table 5.2: Child weight status by food-related parenting beliefs (n=280)**

	Disagree / Strongly disagree n (%)	Neutral n (%)	Strongly agree / Agree n (%)	P
Keeping my child happy is more important than getting him/her to eat healthy foods				
Normal BMI	187 (83.9)	32 (14.4)	4 (1.8)	0.19 <sup>2</sup>
Overweight / Obese	53 (93.0)	4 (7.0)	0 (0.0)	
It is important for parents to keep trying to get children to eat foods they have previously rejected				
Normal BMI	12 (5.4)	43 (19.3)	168 (75.3)	0.61 <sup>2</sup>
Overweight / Obese	4 (7.0)	8 (14.0)	45 (79.0)	
It won't do children any harm to miss a meal if they refuse to eat what I have served				
Normal BMI	77 (34.5)	50 (22.4)	96 (43.1)	0.87 <sup>1</sup>
Overweight / Obese	21 (36.8)	11 (19.3)	25 (43.9)	
Children have their own food likes and dislikes which I cannot change				
Normal BMI	92 (41.3)	58 (26.0)	73 (32.7)	0.03 <sup>1</sup>
Overweight / Obese	34 (59.7)	13 (22.8)	10 (17.5)	
If my child doesn't like what is being served, I make him/her something else				
Normal BMI	139 (62.3)	45 (20.2)	39 (17.5)	0.83 <sup>1</sup>
Overweight / Obese	38 (66.7)	10 (17.5)	9 (15.8)	
I have methods for getting my child to eat foods he/she doesn't like				
Normal BMI	53 (23.8)	59 (26.5)	111 (49.8)	0.27 <sup>1</sup>
Overweight / Obese	8 (14.0)	16 (28.1)	33 (57.9)	
I am guided by my child's preferences when I am shopping for food				
Normal BMI	59 (26.5)	79 (35.4)	85 (38.1)	0.78 <sup>1</sup>
Overweight / Obese	17 (29.8)	21 (36.8)	19 (33.3)	
When my child demands a particular food I can ignore him/her				
Normal BMI	30 (13.5)	45 (20.2)	148 (66.4)	0.54 <sup>1</sup>
Overweight / Obese	11 (19.3)	11 (19.3)	35 (61.4)	
	Rarely / Never n (%)	Sometimes n (%)	Almost always / Often n (%)	P
Even if I don't think I should, when my child asks for a certain food I give it to him/her				
Normal BMI	95 (42.6)	114 (51.1)	14 (6.3)	0.34 <sup>2</sup>
Overweight / Obese	20 (35.1)	35 (61.4)	2 (3.5)	
I negotiate with my child to get him/her to eat foods he/she dislikes				
Normal BMI	89 (39.9)	83 (37.2)	51 (22.9)	0.49 <sup>1</sup>
Overweight / Obese	19 (33.3)	21 (36.8)	17 (29.8)	

1: P-value based on Chi-square test

2: P-value based on Fisher's exact

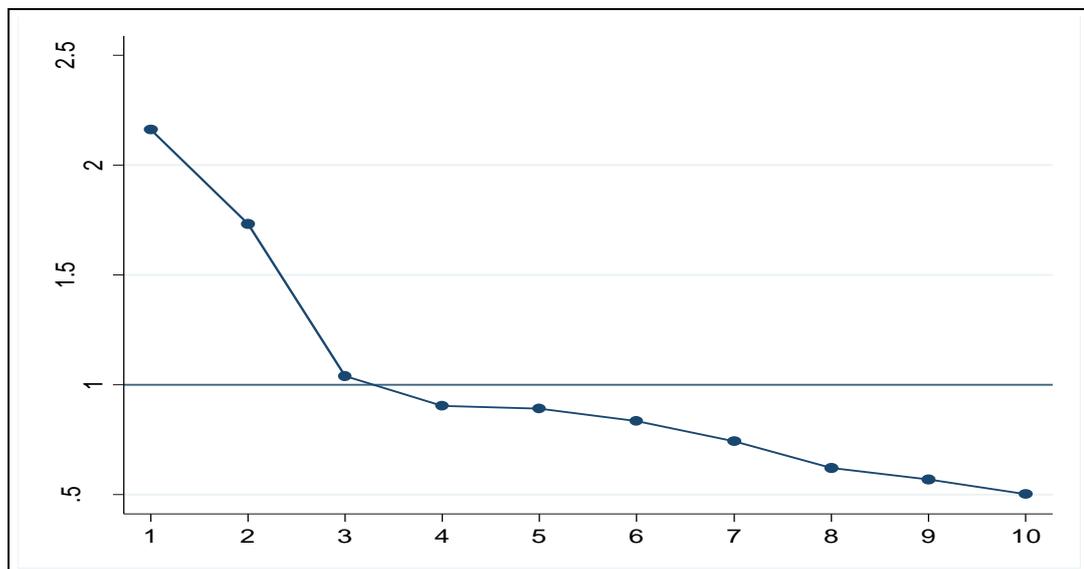
### 5.3 A factor analysis of food-related parenting beliefs and practices

It is possible that certain combinations of parenting food-related beliefs and practices may contribute to the greater prevalence of child overweight/obesity in some households. Therefore, exploratory factor analysis was conducted on the 10 items describing food-related beliefs and practices to see if there were any patterns in mothers' responses to these questions, with a view to reducing the 10 items to several factors predictive of weight status.

Pearson's correlation coefficient was calculated for each pair of items to assess the strength of the linear association between the items, shown in Table 5.3. A factor solution was constructed and factors with a corresponding eigenvalues greater than one were retained in the final solution (Kaiser, 1960).

Figure 5.3 is a scree plot of the factor solution, showing eigenvalues for each factor. Three primary factors explained 49% of the overall variation in the data. The factors retained from the rotated factor solution are detailed in Table 5.4.

**Figure 5.3: A scree plot based on the 10 food-related parenting beliefs and practices**



**Table 5.3: Matrix of the Pearson's correlation coefficient between pairs of 10 items characterising food-related parenting beliefs and practices (n=280)**

	1. Keeping my child happy is more important than getting him/her to eat healthy foods	2. It is important for parents to keep trying to get children to eat foods they have previously rejected	3. It won't do children any harm to miss a meal if they refuse to eat what I serve	4. Children have their own food likes and dislikes which I cannot change	5. Even if I don't think I should, when my child asks for a certain food I give it to him/her (frequency)	6. If my child doesn't like what is being served, I make him/her something else	7. I negotiate with my child to get him/her to eat foods he/she dislikes (frequency)	8. I have methods for getting my child to eat foods he/she doesn't like	9. I am guided by my child's preferences when I am shopping for food	10. When my child demands a particular food I can ignore him/her
Item 1	1.00									
Item 2	0.10	1.00								
Item 3	0.11	0.14	1.00							
Item 4	0.29	0.09	0.04	1.00						
Item 5	0.33	-0.02	-0.01	0.14	1.00					
Item 6	0.24	0.12	0.25	0.16	0.31	1.00				
Item 7	-0.07	0.29	0.12	-0.03	-0.22	0.00	1.00			
Item 8	0.11	0.25	0.10	0.11	0.09	0.16	0.34	1.00		
Item 9	0.21	0.00	-0.02	0.18	0.10	0.26	-0.21	-0.05	1.00	
Item 10	0.06	0.16	0.16	0.12	0.16	0.18	0.01	0.10	0.08	1.00

As Table 5.4 shows, the first factor, “Obliging”, consisted of four items concerning the degree to which mothers allowed children to determine their own diets. To assist with interpreting this factor, all items were coded so that higher scores (i.e. stronger agreement) reflected greater tendency for mothers to be obliging. The second factor, “Influence”, grouped together three items reflecting the degree to which mothers persistently negotiate with children, particularly to encourage the eating of disliked foods. The third factor, “Firmness”, included three questions relating to the degree to which mothers can consistently employ their food-related beliefs and practices. This factor solution explained 49% of the overall variation in the original set of 10 items.

**Table 5.4: Rotated factor solution**

	Factor 1	Factor 2	Factor 3
<b>Factor 1 : Obliging</b>			
Even if I don't think I should, when my child asks for a certain food I give it to him/her	0.63	-0.20	0.18
Keeping my child happy is more important than getting him/her to eat healthy foods	0.71	0.09	0.01
I am guided by my child's preferences when I am shopping for food	0.54	-0.27	0.10
Children have their own food likes and dislikes which I cannot change	0.62	0.17	-0.08
<b>Factor 2 : Influence</b>			
I negotiate with my child to get him/her to eat foods he/she dislikes	-0.23	0.78	0.03
I have methods for getting my child to eat foods he/she doesn't like	0.23	0.71	0.05
It is important for parents to keep trying to get children to eat foods they have previously rejected	0.11	0.61	0.22
<b>Factor 3 : Firmness</b>			
If my child doesn't like what is being served, I make him/her something else	-0.46	-0.03	-0.55
When my child demands a particular food I can ignore him/her	0.11	0.02	0.64
It won't do children any harm to miss a meal if they refuse to eat what I serve	-0.08	0.14	0.74

#### 5.4 Food-related parenting beliefs and practices subscales and child weight status

The factors Obliging, Influence, and Firmness were used to derive corresponding subscales. For each factor, maternal responses to the component items were summed to create a subscale score, which could range from 0 to 20 for Obliging and 0 to 15 for Influence and Firmness. Higher scores on each subscale reflect a greater degree of parenting beliefs and practices in line with the label.

Figure 5.4: Distribution of mother's Obliging subscale scores (n=280)

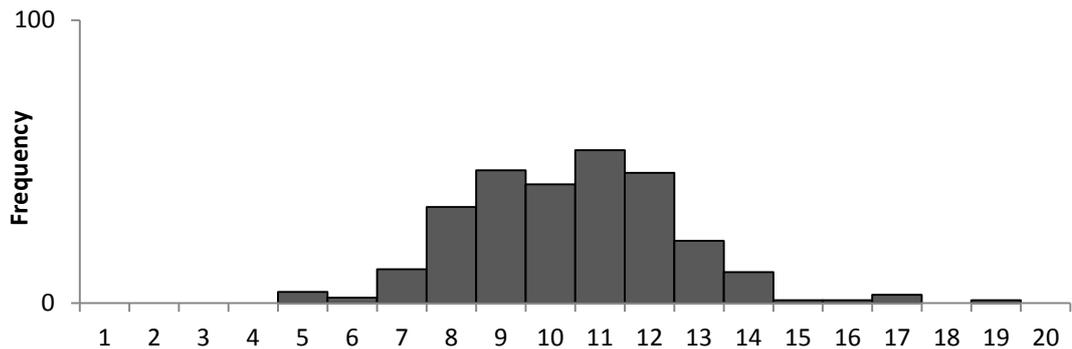


Figure 5.5: Distribution of mother's Influence subscale scores (n=280)

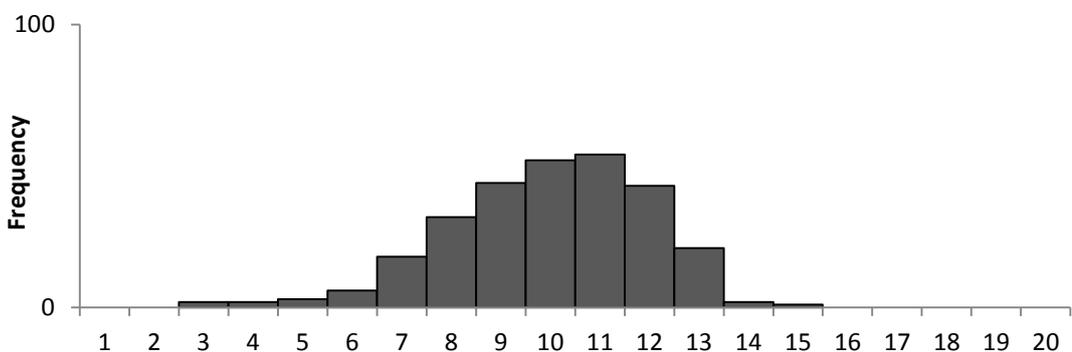
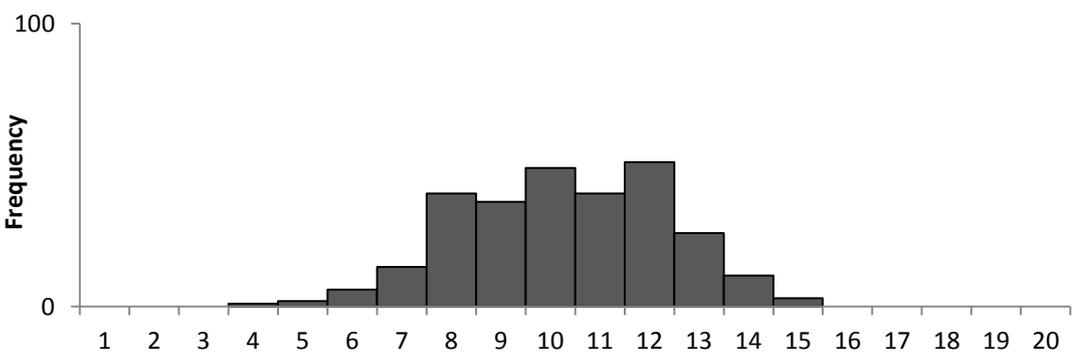


Figure 5.6: Distribution of mother's Firmness subscale scores (n=280)



The three subscales cannot wholly represent the overall food-related parenting beliefs and practices of the respondent mothers. Mothers are likely to adjust their child feeding practices frequently to accommodate day-to-day situations and may engage in practices that are not measured by the factors. It is also possible that mothers may endorse all of the child feeding beliefs/practices described in the 10 items to some degree and consequently, mothers may score highly on more than one of the subscales. For this reason, in the following analysis, each of the subscales is considered in isolation.

The distribution of the subscale scores was assessed for normality using the K<sup>2</sup> test of D’Agostino et al. (1990); scores were acceptably normal.

Mean maternal scores for the Obliging, Influence and Firmness subscales were compared for child BMI categories (Table 5.5). Mothers with overweight/obese children had significantly lower mean scores for Obliging compared to mothers of normal weight children.

**Table 5.5: Child weight status by mother’s Obliging, Influence and Firmness subscale scores (n=280)**

Subscale	Normal weight child	Overweight or Obese child	<i>P</i> <sup>1</sup>
	mean (SD)	mean (SD)	
Obliging	10.6 (2.2)	9.9 (1.9)	0.04
Influence	9.9 (2.0)	10.2 (2.2)	0.27
Firmness	7.7 (2.1)	7.8 (2.2)	0.71

1: P-value based on Student’s t-test

These results were confirmed by logistic regression which, in addition, showed there was no association between either Influence or Firmness and child weight status when all three factors were considered together in an additive model.

### **5.5 Food-related parenting beliefs and practices subscale scores, socio-economic status, and child weight status**

Mother’s scores for the Obliging, Influence and Firmness subscales were compared for SES groups (Table 5.6). There were no statistically significant differences, although there was a suggestion that mothers who had a university degree were less obliging and more firm than other mothers.

**Table 5.6: Mother's Obliging, Influence and Firmness subscale scores for each SES group (n=280)**

Subscale	Maternal educational attainment				P <sup>1</sup>
	Incomplete high school	Completed high school	Completed TAFE	Completed university	
	mean (SD)	mean (SD)	mean (SD)	mean (SD)	
Obliging	10.7 (2.5)	10.5 (2.0)	10.4 (2.0)	9.9 (1.9)	0.13
Influence	9.7 (2.3)	9.6 (1.8)	10.3 (2.0)	10.0 (1.9)	0.22
Firmness	9.9 (2.1)	10.2 (2.2)	10.4 (2.1)	10.5 (1.9)	0.29

1: P-value based on one-way analysis of variance

To investigate whether relationships between Obliging, Influence and Firmness and child weight status were present in some SES groups but not others, stratified analyses were undertaken. Results are presented in Table 5.7. Note that the relatively small sample sizes in some of the subgroups may have resulted in limited power to detect effects as statistically significant.

**Table 5.7: Child weight status by mother's Obliging, Influence and Firmness subscale scores for each SES group (n=280)**

Subscale	Maternal educational attainment	Normal weight child		Overweight or Obese child		P <sup>1</sup>
		n	mean(SD)	n	mean (SD)	
		Obliging	Incomplete high school	68	10.8 (2.6)	
	Completed high school	31	10.4 (2.1)	10	11.0 (1.6)	0.39
	Completed TAFE	70	10.8 (1.9)	29	9.8 (2.0)	0.02
	Completed university	54	10.0 (1.8)	11	9.5 (2.3)	0.51
Influence	Incomplete high school	68	9.6 (2.3)	7	10.9 (2.0)	0.16
	Completed high school	31	9.6 (2.0)	10	9.6 (1.2)	0.99
	Completed TAFE	70	10.2 (1.8)	29	10.4 (2.4)	0.53
	Completed university	54	10.1 (1.8)	11	9.8 (2.7)	0.72
Firmness	Incomplete high school	68	9.9 (2.1)	7	9.9 (2.4)	0.93
	Completed high school	31	10.3 (2.2)	10	9.9 (2.3)	0.61
	Completed TAFE	70	10.5 (1.9)	29	10.3 (2.5)	0.81
	Completed university	54	10.6 (2.0)	11	10.3 (1.3)	0.62

1: P-value based on Student's t-test

Among TAFE educated mothers, Obliging scores were, on average, lower for those with obese/overweight children than for those with normal weight children. In other SES groups, there was no statistically significant association between Obliging score and child weight status.

There were no statistically significant associations between Influence or Firmness scores and child weight status within separate SES groups. In all SES groups, the mean Influence and Firmness scores for

mothers of normal weight were similar to the mean scores of mothers with overweight or obese children. Amongst families with a university educated mother, in all three subscales, the mean scores for mothers with an overweight or obese child were lower, on average, than the scores of mothers of normal weight children.

Separate logistic regression analyses were undertaken to determine if there were interactions between each of three scores, respectively, and SES in relation to child weight status. Results were not statistically significant. An additive model considering the three scores simultaneously and SES did not converge.

## **5.6 Summary**

This chapter examined relationships between food-related parenting beliefs and practices of mothers and child overweight/obesity. When 10 food-related beliefs and practices were considered separately, only the belief that children have unalterable food preferences was associated with child weight status: mothers who held this belief were *less* likely than other mothers to have overweight/obese children. When the beliefs and practices were amalgamated to form subscales reflecting Obliging, Influence and Firmness, the Obliging score was associated with child weight status: more obliging mothers were *less* likely to have overweight/obese children. However, there was scant evidence for differences in Obliging, Influence and Firmness scores for mothers in different SES groups. Within SES groups, in general, scores were not associated with child weight status, the exception being for families where mothers had attained TAFE education. In this group of families, there was some evidence that mothers who were less obliging were more likely to have overweight/obese children.

## Chapter 6: Parental work patterns, mother’s work-life balance, and child overweight and obesity

This chapter concerns aspects of the work arrangements of parents, implications for child overweight/obesity, and possible explanations for SES differentials in child overweight/obesity. Two parent families are the focus of this chapter so that combinations of parental work arrangements can be considered.

The first aspect of work considered briefly is whether or not parents undertake paid work, work part-time or full-time. A second aspect of work is considered in more depth, the work schedules of parents, with attention directed to family-unfriendly work schedules. Finally, the work-life balance of mothers is investigated.

### 6.1 Two parent families

This section focuses on two parent families, since associations are likely to be influenced (or confounded) by relationship status, and stratification (i.e. considering two parent and lone parent families separately) is one approach to address this.

#### 6.1.1 Parental employment, socio-economic status, and child weight status

Profiles of parental employment for the entire study sample were presented in Table 4.2 and overall associations with child weight status were described in Section 4.3. A summary of the relationship between child weight status by parental employment status in two parent families is presented in Table 6.1.

**Table 6.1: Child weight status by parental employment status, for two parent families**

Parental employment	Normal weight child n (%)	Overweight or Obese child n (%)	<i>P</i>
Mother’s employment status (n=262)			
Not employed	45 (86.5)	7 (13.5)	0.12 <sup>1</sup>
Part-time	126 (81.2)	28 (18.2)	
Full-time	40 (71.4)	16 (28.6)	
Partner’s employment status (n=260)			
Not employed	21 (91.3)	2 (8.7)	0.36 <sup>2</sup>
Part-time	8 (72.7)	3 (27.3)	
Full-time	180 (79.7)	46 (20.4)	

1: P-value based on Chi-square test

2: P-value based on Fisher’s exact test

These data suggest that child overweight/obesity may be more common in families where mothers worked full-time and least common where mothers were not in the paid workforce, but this relationship was not statistically significant. Partner's employment status was not associated with child weight status.

Parental employment status was compared for SES groups. Both mother's and partner's employment status varied with SES.

**Table 6.2: Parental employment status by SES, for two parent families**

Parental employment	Maternal educational attainment				<i>P</i>
	Incomplete high school n (%)	Completed high school n (%)	Completed TAFE n (%)	Completed university n (%)	
Mother's employment status (n=262)					
Not employed	24 (35.3)	7 (18.4)	14 (15.4)	7 (10.8)	0.01 <sup>1</sup>
Working part-time	29 (42.7)	22 (57.9)	61 (67.0)	42 (64.6)	
Working full-time	15 (22.1)	9 (23.7)	16 (17.6)	16 (24.6)	
Partner's employment status (n=260)					
Not employed	11 (16.7)	2 (5.3)	8 (8.8)	2 (3.1)	0.02 <sup>2</sup>
Working part-time	1 (1.5)	0 (0.0)	3 (3.3)	7 (10.8)	
Working full-time	54 (81.8)	36 (94.7)	80 (87.9)	56 (86.2)	

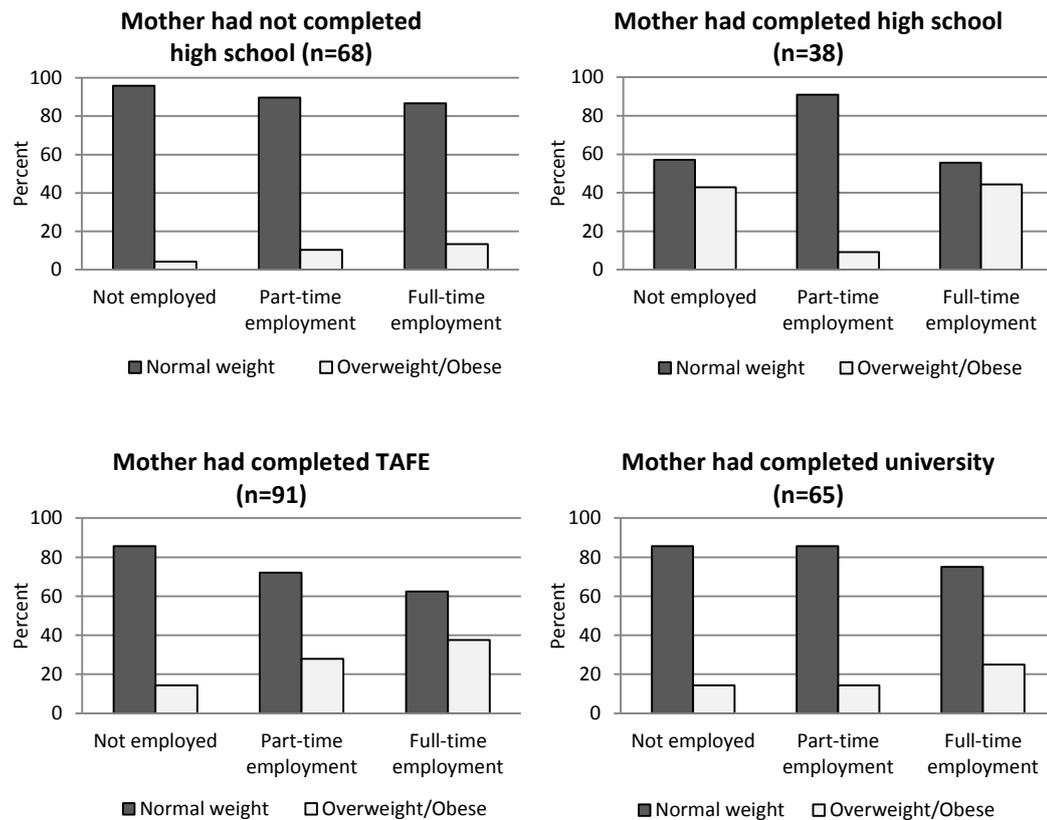
1: P-value based on Chi-square test

2: P-value based on Fisher's exact test

Almost a quarter of mothers worked full-time, except in families where maternal educational attainment was a TAFE qualification, where this proportion was lower (18%). There was a gradient in the proportion of mothers working part-time, with the proportion increasing from 43% to 65% with increasing maternal educational attainment. The opposite pattern was seen with respect to the proportion of mothers not in paid employment; this decreased from 35% to 11% with increasing maternal educational attainment.

The great majority of partners had full-time paid employment, although it is notable that this proportion was lowest (82%) in families where the mother had not completed high school. Part-time work by partners was uncommon except in families where the mother had completed university. The proportion of partners not in paid employment decreased from 17% to 3% as maternal educational attainment increased.

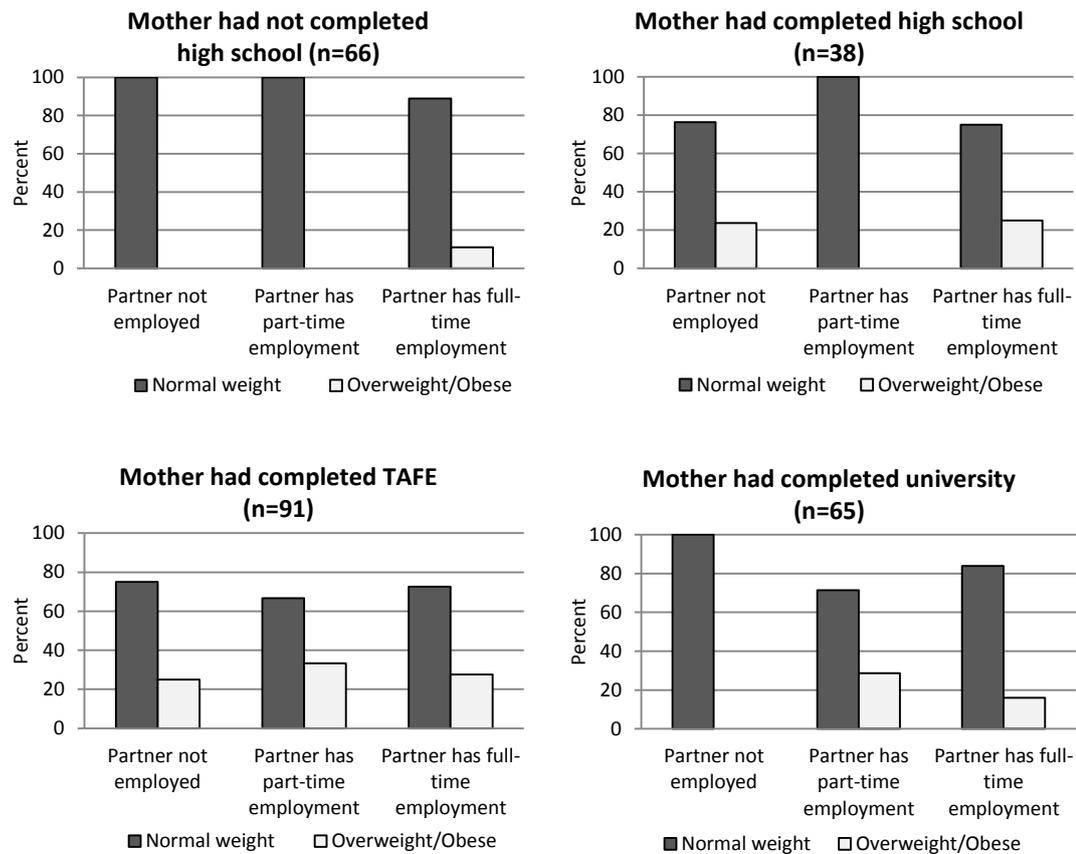
**Figure 6.1: Child weight status by mother's employment status within SES groups, for two parent families**



When stratified by SES, the association between maternal employment categories and child weight status was significant only for families where the mother had completed high school (Fisher's exact  $P=0.04$ ). Within the families where the mother had completed high school, only 9% of children were overweight or obese when mother's worked part-time, but approaching half of the children were categorised as overweight/obese when mothers worked full-time (44%) or were not employed (43%). It is interesting that in each of the other SES groups, there was a consistent tendency for child overweight/obesity to be least prevalent where mothers were not employed and most prevalent where mothers were employed full-time, although this trend was not statistically significant.

None of the associations between paternal employment and child weight status were significant when stratified by SES (Figure 6.2).

**Figure 6.2: Child weight status by partner's employment status within SES groups, for two parent families**



Since almost all fathers worked full-time there was insufficient power to consider combinations of parental employment.

A logistic regression analysis was undertaken to formally investigate whether there was an interaction between mother's employment status and SES in relation to the outcome of child overweight/obesity. There was no statistically significant interaction. The fit of a similar logistic regression model for partner's employment status did not converge.

### 6.1.2 Parental work schedules, socio-economic status, and child weight status

Work schedules are another aspect of employment. As described in Section 3.4.7, mothers and partners were classified as to whether or not they had family-unfriendly work schedules. The different components of family-unfriendly work hours are shown in Table 6.2. Mothers or partners who frequently (always or often) worked shifts, after 6pm or overnight, and/or on weekends were considered to have family-unfriendly work schedules.

**Table 6.3: Frequency with which parents worked components of family-unfriendly schedules, for two parent families**

Parent		Shift work	Work after 6pm or overnight	Work on weekends	
		n (%)	n (%)	n (%)	n (%)
Mother (n=209)	Always	19 (9.1)	21 (10.1)	17 (8.1)	
	Often	5 (2.4)	29 (13.9)	31 (14.8)	
	Sometimes	6 (2.9)	41 (19.6)	39 (18.7)	
	Rarely	8 (3.8)	23 (11.0)	21 (10.1)	
	Never	171 (81.8)	95 (45.5)	101 (48.3)	
		Family-unfriendly work schedule			
	Family-friendly work schedule				134 (64.1)
Partner (n=237)	Always	28 (11.8)	36 (15.2)	46 (19.4)	
	Often	6 (2.5)	51 (21.5)	40 (16.9)	
	Sometimes	12 (5.1)	57 (24.1)	65 (27.4)	
	Rarely	6 (2.5)	20 (8.4)	28 (11.8)	
	Never	185 (78.1)	73 (30.8)	58 (24.5)	
		Family-unfriendly work schedule			
	Family-friendly work schedule				117 (49.4)

Over a third of the 209 partnered mothers in paid employment had a family-unfriendly work schedule. This was largely due to work after 6pm, overnight or on weekends, rather than shift work. A large proportion of partnered mothers with a family-unfriendly work schedule had at least two features of their work hours that were family-unfriendly (n=29, 39%) and some had three (n=9, 12%).

Among partners in paid employment, half had a family-unfriendly work schedule. Again, this was predominantly due to working hours occurring after 6pm, overnight or on weekends, rather than shift work. Of those partners who had a family-unfriendly work schedule, 47 (39%) had two features of their work hours that were family-unfriendly and 20 (17%) had three.

**Table 6.4: Child weight status by parental work schedules, for two parent families**

Parental work schedule	Normal weight child n (%)	Overweight or Obese child n (%)	P <sup>1</sup>
Mother in workforce (n=209)			
Family-unfriendly work schedule	55 (73.3)	20 (26.7)	0.14
Family-friendly work schedule	110 (82.1)	24 (17.9)	
Partner in workforce (n=237)			
Family-unfriendly work schedule	88 (73.3)	32 (26.7)	0.02
Family-friendly work schedule	100 (85.5)	17 (14.5)	
Combined parental work schedules where both in workforce (n=195)			
Both parents have family-unfriendly work schedules	17 (54.8)	14 (45.2)	0.00
Partner has family-unfriendly work schedule, mother does not	50 (84.6)	14 (15.4)	
Mother has family-unfriendly work schedule, partner does not	33 (78.1)	6 (21.9)	
Neither parent has family-unfriendly work schedule	53 (86.9)	8 (13.1)	
Combined parental work schedules, all two parent families (n=259)			
Both parents have family-unfriendly work schedules	17 (54.8)	14 (45.2)	0.00
Partner has family-unfriendly work schedule, mother does not <sup>2</sup>	71 (79.8)	18 (20.2)	
Mother has family-unfriendly work schedule, partner does not <sup>2</sup>	38 (86.4)	6 (13.6)	
Neither parent has family-unfriendly work schedule <sup>2</sup>	82 (86.3)	13 (13.7)	

1: P-value based on Chi-square test

2: Whether or not in paid employment

Associations between parental work schedules and child weight status for two parent families are presented in Table 6.2. Among families in which the mother undertook paid employment, the association between mother's work schedule and child weight status was not statistically significant. Where partners had a family-unfriendly work schedule, children were significantly more likely to be classified as overweight or obese (27%) than if partners were working family-friendly schedules (15%).

When combined work schedules were considered, for families in which both parents undertook paid employment, child overweight/obesity was highest (45%) where both parents had family-unfriendly work schedules and lowest when neither parent worked unfriendly schedules (13%).

Among families in which the mother's partner undertook paid employment (regardless of her employment status), child overweight/obesity was also more common when the partner (only) had a family-unfriendly work schedule (20%) than when he did not (14%), and most prevalent where both parents had family-unfriendly work schedules.

**Table 6.5: Parental work schedules by SES group, for two parent families**

Parental work schedule	Maternal educational attainment				P <sup>1</sup>
	Incomplete high school n (%)	Completed high school n (%)	Completed TAFE n (%)	Completed university n (%)	
Mother in workforce (n=209)					
Family-unfriendly work schedule	15 (34.1)	6 (19.4)	26 (33.8)	28 (49.1)	0.04
Family-friendly work schedule	29 (65.9)	25 (80.7)	51 (66.2)	29 (50.9)	
Partner in workforce (n=237)					
Family-unfriendly work schedule	27 (49.1)	17 (47.2)	50 (60.2)	26 (41.3)	0.14
Family-friendly work schedule	28 (50.9)	19 (52.8)	33 (39.8)	37 (58.7)	
Combined parental work schedules where both in workforce (n=195)					
Both parents have family-unfriendly schedules	3 (7.9)	2 (6.5)	13 (18.3)	13 (23.6)	0.03
Mother has family-unfriendly schedule, not partner	9 (23.7)	4 (12.9)	11 (15.5)	15 (27.3)	
Partner has family-unfriendly schedule, not mother	14 (36.8)	13 (41.9)	29 (40.9)	8 (14.6)	
Neither parent has family-unfriendly schedule	12 (31.6)	12 (38.7)	18 (25.4)	19 (34.6)	
Combined parental work schedules, all two parent families <sup>2</sup> (n=259)					
Both parents have family-unfriendly schedules	3 (4.6)	2 (5.3)	13 (14.3)	13 (20.3)	0.03
Mother has family-unfriendly schedule, partner does not <sup>2</sup>	12 (18.2)	4 (10.5)	13 (14.3)	15 (23.4)	
Partner has family-unfriendly schedule, mother does not <sup>2</sup>	24 (36.4)	15 (39.5)	37 (40.7)	13 (20.3)	
Neither parent has family-unfriendly schedule <sup>2</sup>	27 (40.9)	17 (44.7)	28 (30.8)	23 (35.9)	

1: P-value based on Chi-square test

2: Whether or not in paid employment

Parental work schedules were compared for SES groups. There were statistically significant variations in whether or not mother's and partner's work schedules were family-unfriendly according to SES group (Table 6.5).

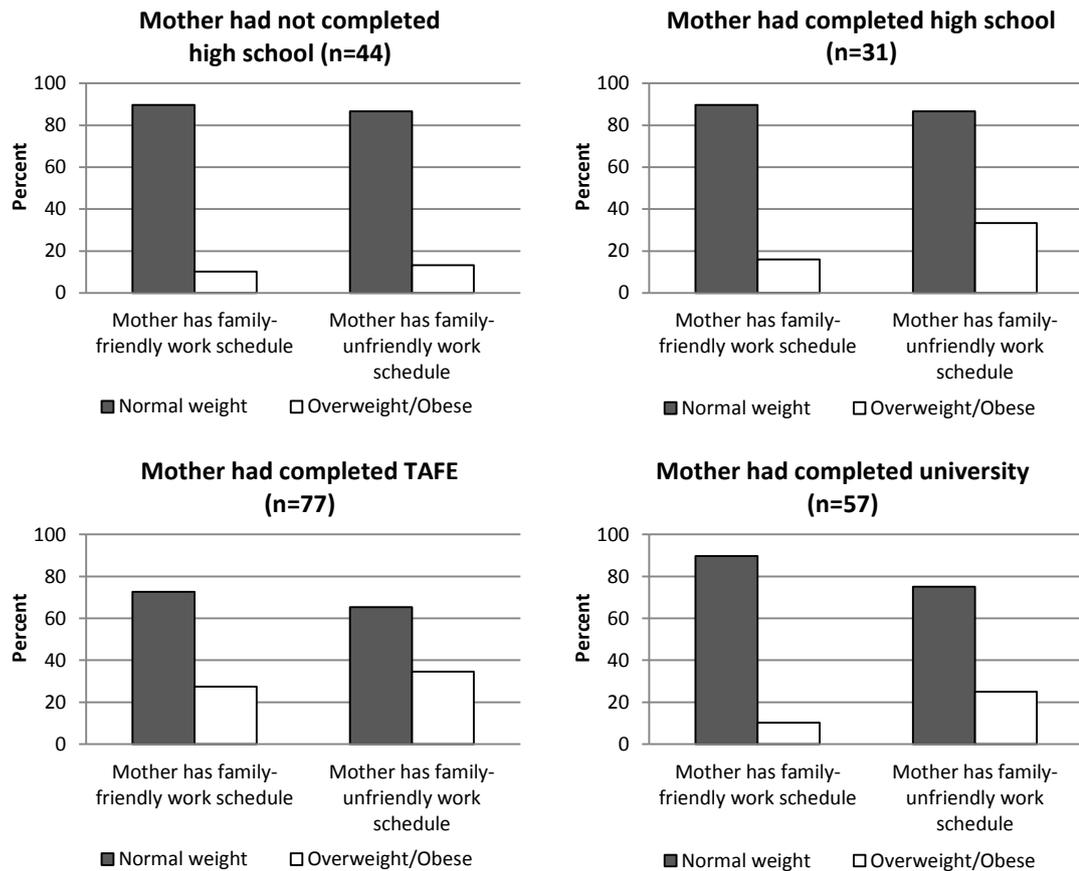
The highest proportion of mothers with family-unfriendly work schedules occurred in families where mothers had completed a university degree (49%), followed by families where mothers had not completed high school (34%). The highest proportion of partners with family-unfriendly work schedules occurred in families where mothers had a TAFE qualification (60%) and the lowest in families where mothers had a university degree (41%).

Considering combined parental work schedules where both parents undertook paid employment, families where mothers had university level qualifications had the highest proportion of both parents working unfriendly schedules (24%) followed by families with TAFE educated mothers (18%).

Considering combined parental work schedules for all two parent families, the prevalence of both parents having family-unfriendly work schedules increased with increasing educational attainment of mothers, reaching 20% in families where the mother had a university degree. For mothers, but not partners, having family-unfriendly work schedules was also highest in families where mothers had a university degree

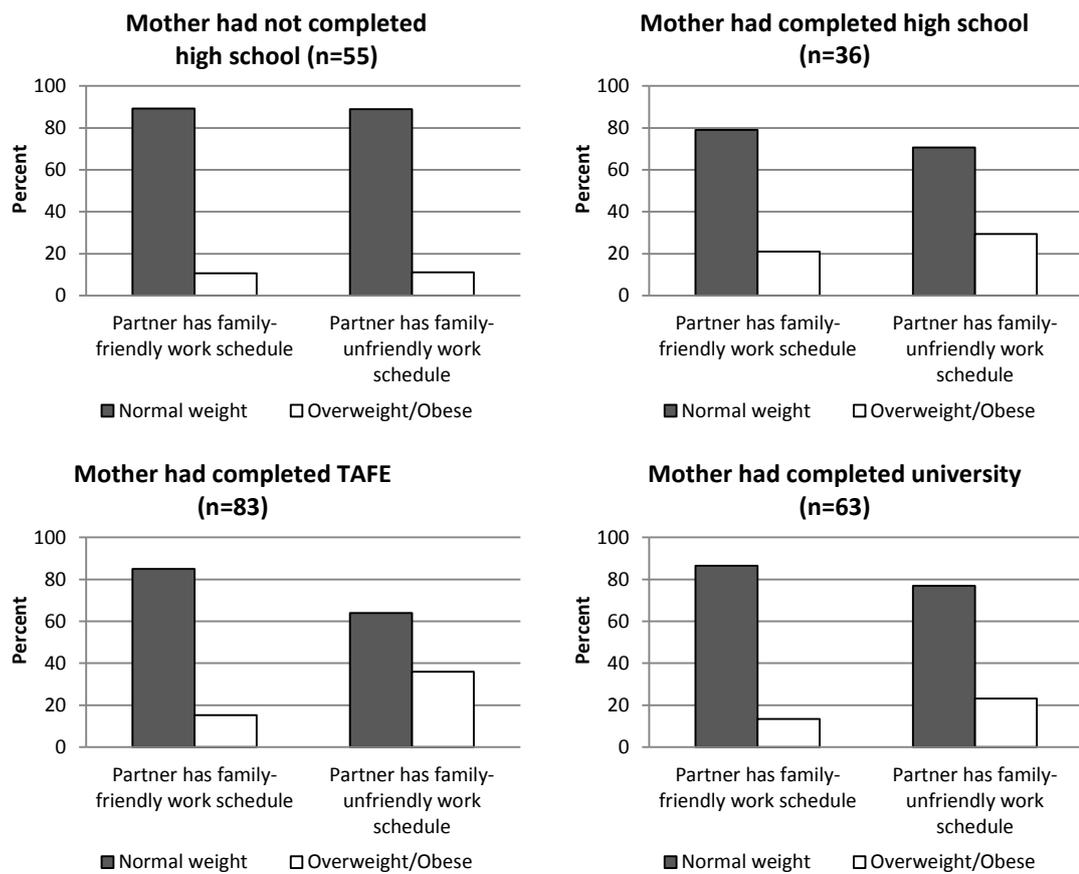
(23%), followed by families in which the mother had not completed high school (18%). Partners, but not mothers, having a family-unfriendly work schedule was the scenario for 40% of families in all SES groups except the group indicated by the mother having a university degree, where this was the case for only 20% of families. Between 36% and 45% of two parent families had neither parent with a family-unfriendly work schedule.

**Figure 6.3: Child weight status by mother's work schedule within SES groups, for two parent families**



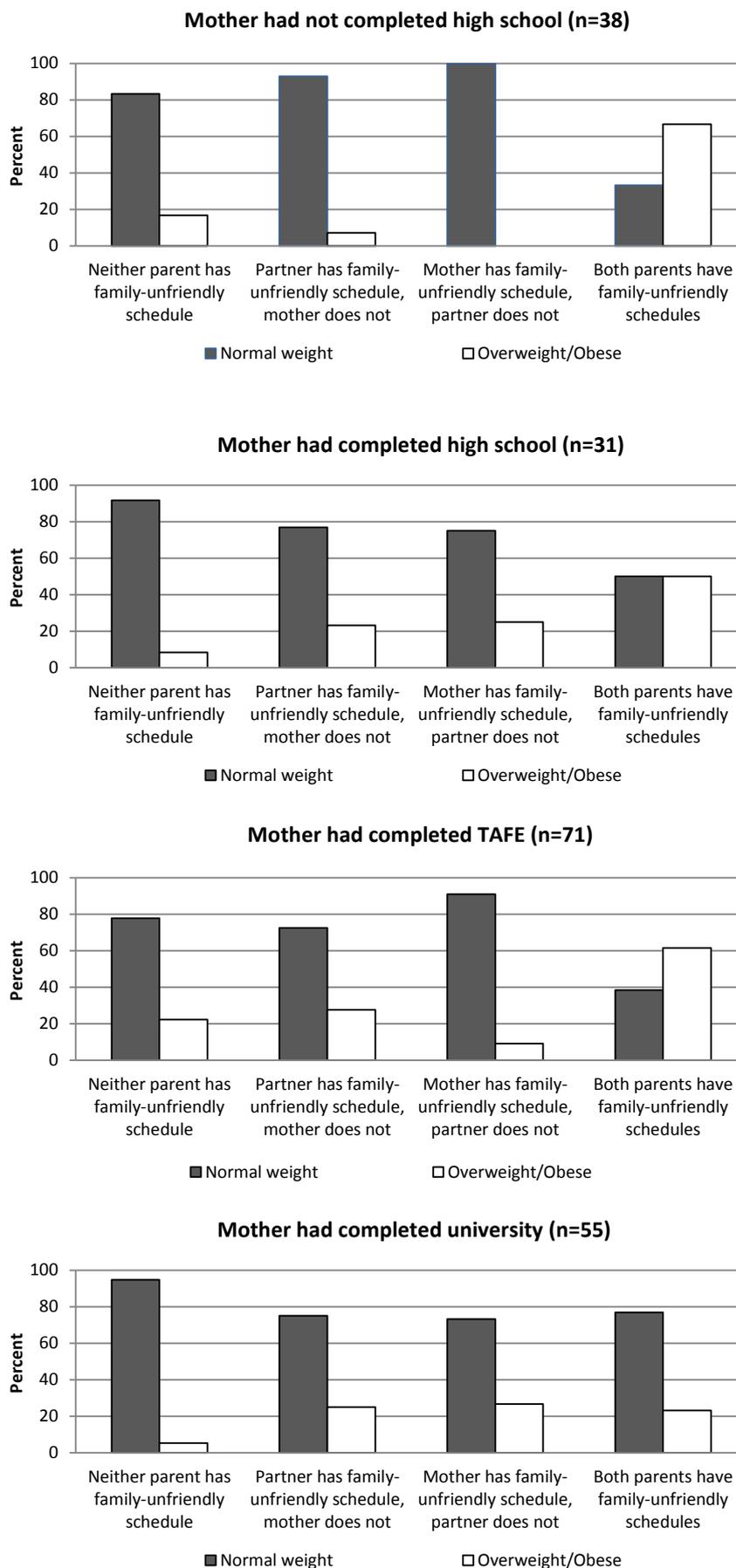
In two parent families, associations between mother's work schedule and child weight status remained non-significant within each SES group, although the data consistently suggested children were more likely to be overweight/obese where the mother had a family-unfriendly work schedule (Figure 6.3).

**Figure 6.4: Child weight status by partner's work schedule within SES groups, for two parent families**



For two parent families, when stratified by SES, the association between partner's work schedules and child weight status was statistically significant for families in which mothers held TAFE level qualifications ( $P=0.05$ ; Figure 6.4). Results for families in which mothers had completed high school or had a university degree were consistent but not statistically significant.

**Figure 6.5: Child weight status by parental work schedules within SES groups, for two parent families where both parents undertook paid employment**

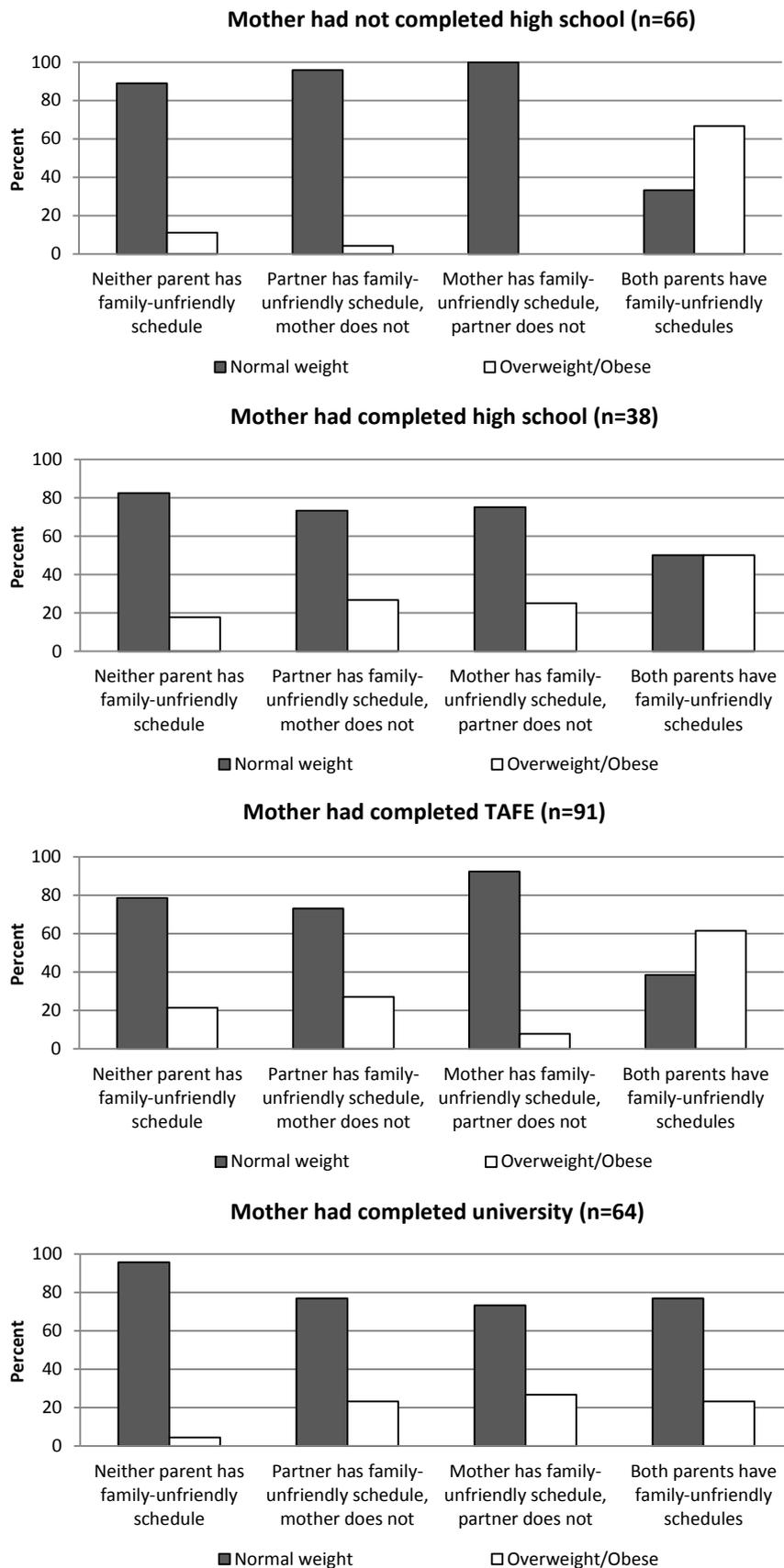


For two parent families where both parents were employed, when stratified by SES, the association between parents combined work schedules and child weight status was statistically significant for families in which mothers had not completed high school ( $P=0.04$ ; Figure 6.5) and families where mothers held TAFE level qualifications ( $P=0.04$ ; Figure 6.5). Results for families in which mothers had completed high school or had a university degree were not statistically significant.

When considering all two parent families, irrespective of employment status, when stratified by SES, the association between parents combined work schedules and child weight status was again statistically significant for families in which mothers had not completed high school ( $P=0.02$ ; Figure 6.6) and families where mothers held TAFE level qualifications ( $P=0.02$ ; Figure 6.6).

A logistic regression was performed to determine if there was an interaction between mother's work schedule and SES in relation to child weight status. Results were not statistically significant. A similar model for partner's work schedule also showed no significant interaction with SES. The fit of a model for parental combined work schedules did not converge.

**Figure 6.6: Child weight status by parental work schedules within SES groups, for all two parent families**



## 6.2 Lone parent families

The analyses reported above for two parent families were repeated for lone parent families. However, due to the small number of lone parent families (n=38), statistically significant findings were not expected.

Half of lone mothers in this sample were employed part-time while one quarter were employed full-time. Similar to two parent families, child overweight/obesity tended to be more common in lone parent families where mothers worked full-time and least common where mothers were not in the paid workforce, but this relationship was not statistically significant.

**Table 6.6: Child weight status by mother's employment, for lone parent families (n=38)**

Mother's employment	Normal weight child	Overweight or Obese child	P <sup>1</sup>
	n (%)	n (%)	
Full-time	7 (70.0)	3 (30.0)	0.88
Part-time	15 (79.0)	4 (21.1)	
Not employed	7 (77.8)	2 (22.2)	

1: P-value based Fisher's exact test

As with partnered mothers, lone mothers were most likely to be employed part-time and the proportion of mothers employed part-time increased with increasing educational attainment, from 41% to 75%.

**Table 6.7: Mother's employment by SES group, for lone parent families (n=38)**

Mother's employment	Maternal educational attainment				P <sup>1</sup>
	Incomplete high school	Completed high school	Completed TAFE	Completed university	
	n (%)	n (%)	n (%)	n (%)	
Working full-time	5 (29.4)	1 (16.7)	3 (27.3)	1 (25.0)	0.93
Working part-time	7 (41.2)	4 (66.7)	5 (45.5)	3 (75.0)	
Not employed	5 (29.4)	1 (16.7)	3 (27.3)	0 (0.0)	

1: P-value based on Fisher's exact test

The small number of lone parent families did not permit stratification by SES to further analyses of the association between maternal employment and child weight status.

Almost half of employed lone mothers worked family-unfriendly schedules (Table 6.8). In lone parent families, mother's work schedule was not significantly associated with child weight status.

**Table 6.8: Child weight status by mother's work schedule, for lone parent families**

Mother's work schedule	n (%)	Normal	Overweight or	<i>P</i> <sup>1</sup>
		weight child	Obese child	
		n (%)	n (%)	
Lone mothers in workforce (n=29)				
Family-unfriendly work schedule	13 (44.8)	10 (76.9)	3 (23.1)	1.00
Family-friendly work schedule	16 (55.2)	12 (75.0)	4 (25.0)	
All lone mothers (n=38)				
Family-unfriendly work schedule	13 (34.2)	10 (76.9)	3 (23.1)	1.00
Family-friendly work schedule	16 (42.1)	12 (75.0)	4 (25.0)	
Not employed	9 (23.7)	7(77.8)	2 (22.2)	

1: P-value based on Fisher's exact test

Amongst employed lone mothers, and among all lone mothers, there was no statistically significant association between SES and the type of work schedule.

**Table 6.9: Mother's work schedule by SES group, for lone parent families**

Mother's work schedule	Maternal educational attainment				<i>P</i> <sup>1</sup>
	Incomplete high school	Completed high school	Completed TAFE	Completed university	
	n (%)	n (%)	n (%)	n (%)	
Mother in workforce (n=29)					
Family-unfriendly work schedule	7 (58.3)	0 (0.00)	3 (37.5)	3 (75.0)	0.10
Family-friendly work schedule	5 (41.7)	5 (100.0)	5 (62.5)	1 (25.0)	
All mothers (n=38)					
Family-unfriendly work schedule	7 (41.2)	0 (0.0)	3 (27.3)	3 (75.0)	0.19
Family-friendly work schedule	5 (29.4)	5 (83.3)	5 (45.5)	1 (25.0)	
Not employed	5 (29.4)	1 (16.7)	3 (27.3)	0 (0.0)	

1: P-value based on Fisher's exact test

The small number of lone parent families did not permit stratification by SES to further analyses of the association between mother's work schedule and child weight status.

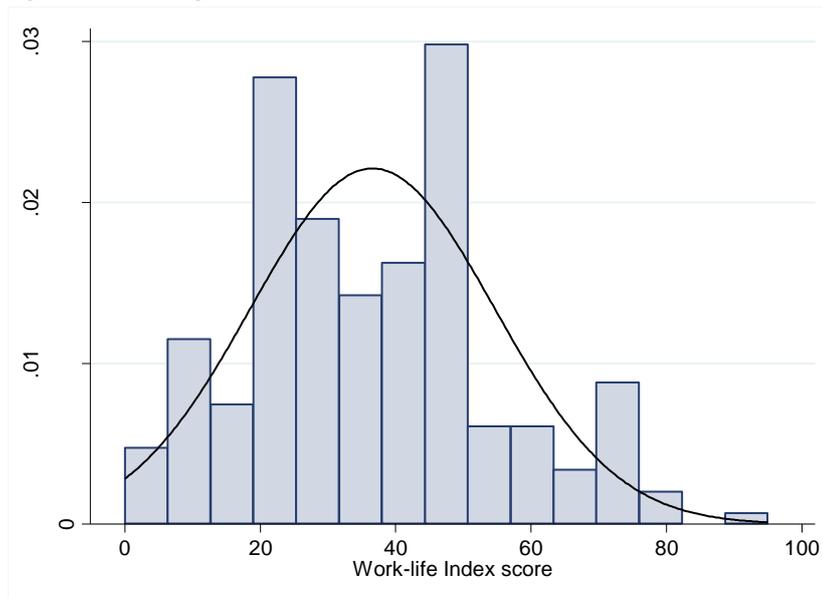
### 6.3 Mother's work-life balance, socio-economic status, and child weight status

Mothers in paid employment were asked to respond to the Work-life Interference index, a five item scale (see Section 3.2 and Table 3.3). To recap, the index measures the extent to which respondents believe their paid employment interferes with their personal and family lives, and their satisfaction with their current work-life balance. Higher scores represent poorer work-life balance.

In the study sample, mother's Work-life Interference scores ranged between 0 and 95, with a mean score of 36.6 (SD 18.0). Only two working mothers received a score of 0, indicating the best possible work-life balance. Most mothers (83%) had a score of 50 or less.

To ascertain whether the Work-life Interference scores were normally distributed a histogram was created (Figure 6.7). A test of the normality of the distribution of Work-life Interference scores showed that the assumption of normality was reasonable for these data.

**Figure 6.7: Histogram of Work-life Interference scores**



**Table 6.10: Mother's Work-life Interference score by work fraction, for partnered mothers and lone mothers**

Family type	Work-life Interference score				P <sup>1</sup>
	Full-time work		Part-time work		
	n	Mean (SD)	n	Mean (SD)	
Partnered mothers (n=205)	54	44.3 (16.3)	151	33.1 (17.7)	0.00
Mothers who are lone parents (n=28)	10	49.0 (17.4)	18	35.8 (17.4)	0.07
All mothers (n=233)	64	45.0 (16.5)	169	33.4 (17.6)	0.00

1: P-value based on Student's t-test

As shown in Table 6.10, Work-life Interference scores significantly varied with maternal work fraction. The mean Work-life Interference score for women who worked part-time was lower in comparison to that for mothers working full-time, irrespective of their partnering status.

### 6.3.1 Two parent families

In two parent families, there was no association between mother's Work-life Interference scores and child weight status when those working full-time and part-time were considered separately (Table 6.11). When full-time and part-time mothers were considered together, those with an overweight/obese child had higher Work-life Interference scores compared with mothers of normal weight children (borderline statistical significance).

**Table 6.11: Child weight status by mother's Work-life Interference score, for two parent families (n=205)**

Mother's work fraction	Work-life Interference Score				P <sup>1</sup>
	Normal weight child		Overweight or Obese child		
	n	Mean (SD)	n	Mean (SD)	
Full-time	38	43.7 (14.8)	16	45.6 (20.0)	0.69
Part-time	124	32.1 (17.3)	27	37.8 (19.0)	0.13
Either full-time or part-time	162	34.8 (17.4)	43	40.7 (19.5)	0.06

1: P-value based on Student's t-test

SES differences in Work-life Interference scores, according to whether mothers worked full-time or part-time, are presented in Table 6.12. For mothers who worked part-time, and for all working mothers, Work-life Interference scores increased as SES increased.

**Table 6.12: Mother's Work-life Interference score by SES group, for two parent families (n=205)**

Mother's work fraction	Work-life Interference Score								P <sup>1</sup>
	Incomplete high school		Completed high school		Completed TAFE		Completed university		
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	
Full-time	14	41.4 (22.4)	9	50.0 (15.4)	16	40.0 (12.1)	15	48.0 (13.6)	0.34
Part-time	28	26.8 (15.6)	22	29.3 (15.2)	60	33.5 (19.1)	41	38.9 (16.7)	0.03
Either full-time or part-time	42	31.7 (19.2)	31	35.3 (18.0)	76	34.9 (18.0)	56	41.3 (16.3)	0.05

1: P-value based on one-way analysis of variance

Within SES groups, the association between child weight status and mothers' Work-life Interference score approached statistical significance only for families where the mother was university educated (Table 6.13). However, a similar pattern was observed for two other SES groups.

**Table 6.13: Child weight status by mother's Work-life Interference score within SES groups, for two parent families (n=205)**

Maternal educational attainment	Work-life Interference Score				P <sup>1</sup>
	Normal weight child		Overweight or Obese child		
	n	Mean (SD)	n	Mean (SD)	
Incomplete high school	37	30.0 (18.1)	5	44.0 (24.8)	0.13
Completed high school	25	33.0 (18.0)	6	45.0 (14.1)	0.14
Completed TAFE	54	35.0 (17.9)	22	34.5 (18.5)	0.92
Completed University	46	39.5 (15.1)	10	50.0 (19.6)	0.06

1: P-value based on Student's t-test

Logistic regression was performed to determine if there was an interaction between mother's Work-life Interference score and SES in relation to child weight status. There was no significant interaction.

### 6.3.2 Lone parent families

One lone mother did not complete the Work-life Interference items. Lone mothers' Work-life Interference scores were not significantly associated with child weight status when full-time and part-time working mothers were considered separately. When all lone working mothers were considered together, mothers of an overweight/obese child had markedly higher Work-life interferences scores than their counterparts with normal weight children.

**Table 6.14: Child weight status by mother's Work-life Interference score, for lone parent families (n=28)**

Mother's work hours	Work-life Interference Score				P <sup>1</sup>
	Normal weight child		Overweight or Obese child		
	n	Mean (SD)	n	Mean (SD)	
Full-time	7	43.6 (17.5)	3	61.7 (10.4)	0.14
Part-time	15	33.3 (16.4)	3	48.3 (20.2)	0.18
Either full-time or part-time	22	36.6 (17.1)	6	55.0 (16.1)	0.03

1: P-value based on Student's t-test

When considering only lone mothers, there was no association between maternal work fraction and Work-life Interference scores within any SES category. However, there were limited data to investigate this relationship.

**Table 6.15: Mother's Work-life Interference score by SES group, for lone parent families (n=28)**

Mother's work hours	Work-life Interference Score								P <sup>1</sup>
	Incomplete high school		Completed high school		Completed TAFE		Completed university		
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	
Full-time	5	42.0 (18.2)	1	-	3	56.7 (7.6)	1	-	0.25
Part-time	7	35.7 (14.6)	3	35.0 (27.8)	5	44.0 (16.4)	3	23.3 (15.3)	0.48
Either full-time or part-time	12	38.3 (15.7)	4	35.0 (22.7)	8	48.8 (14.6)	4	36.3 (28.7)	0.52

1: P-value based on one-way analysis of variance

## **6.4 Summary**

This chapter examined relationships between aspects of parents' work and child overweight/obesity.

In two parent families the associations between either mother's or partner's employment status and child weight status were not significant, although there was some suggestion that where mothers worked full-time, children were most likely to be overweight/obese. There was no significant association between mother's work schedule and child weight status. When partners work family-unfriendly schedules, children were significantly more likely to be overweight/obese than when partners did not. Additionally, almost half of children in families where both parent's worked family-unfriendly work schedules were overweight or obese, although this was a minority of families.

For two parent families, there was evidence that unfriendly schedules of partners contributed to child overweight/obesity in families where mothers held a TAFE qualification. Unfriendly schedules of both parents did not explain SES differences in the prevalence of child overweight/obesity.

Overall, poorer work-life balance was experienced by mothers who worked full-time compared to those who worked part-time. In two parent families, mothers of overweight/obese children had poorer work-life balance than mothers of normal weight children (borderline statistical significance). While this did not appear to be a factor contributing to child overweight/obesity in disadvantaged families, there was evidence that this was relevant to the occurrence of overweight/obesity in children in families where the mother held a university degree (borderline statistical significance).

There were too few lone parent families to support detailed analyses and robust interpretation of results.

## **Chapter 7: Sharing of family responsibilities, gender roles and child overweight and obesity**

The aims of the analyses presented in Chapter 7 are as follows. The first aim was to ascertain the ways family responsibilities were shared between parents and to examine associations with child weight status. The second aim was to assess beliefs and expectations of mothers concerning gender roles within the family, and to determine if there was any relationship between these beliefs and expectations and child weight status. The over-arching aim was to see whether the division of responsibilities and attitudes towards gender roles within families contributed to the social patterning of overweight and obesity in children. Only women who were partnered (n=262) were considered in the analyses for this chapter.

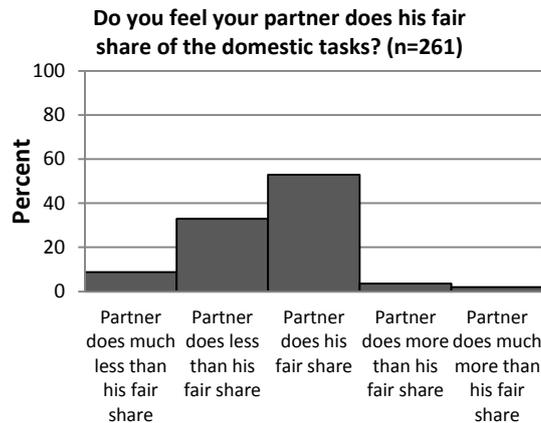
### ***7.1 Sharing of family responsibilities between parents, socio-economic status, and child weight status***

Four questions were used to ascertain the extent to which parents shared family responsibilities (as presented previously in Table 3.4). Two items specifically concerned the fairness of sharing of domestic and childrearing tasks, and a further two items concerned the degree to which the partner took a role in shaping food-related behaviours of children. A total of 261 partnered mothers responded to the first and second question, 246 to the third, and 247 to the fourth.

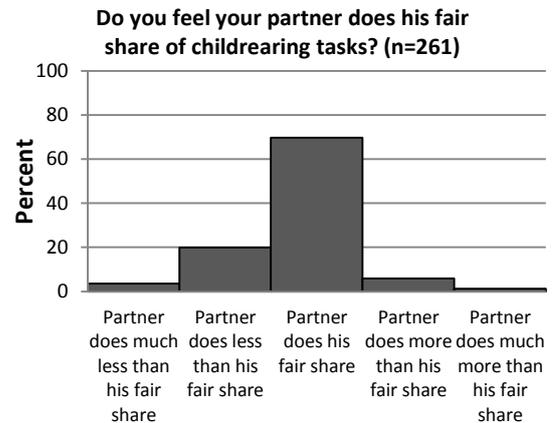
The majority of partners did at least their fair share of domestic tasks (77%) while 59% did at least their fair share of childrearing tasks. Only 4% of partners did much less than their fair share of domestic tasks but almost 10% of partners did much less than their fair share of childrearing. Likewise, most partners were reported to almost always or often encourage children to eat disliked foods (62%) or disciplined children at the table (68%). Few partners never encouraged children to eat (4%) or never disciplined children during meals (2%).

**Figure 7.1: Mother's reports of partner sharing of family responsibilities, for two parent families**

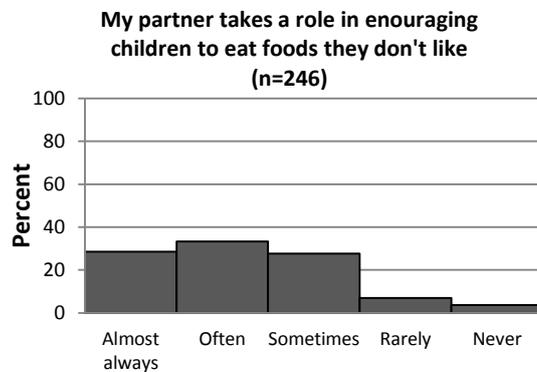
**Item 1**



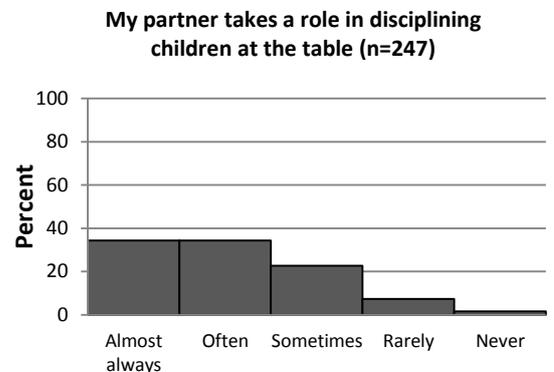
**Item 2**



**Item 3**



**Item 4**



For further analyses, the responses to these four items were compressed. For the items relating to the sharing of domestic and childrearing tasks, the five point response scale was reduced to three categories: partners who did at least their “fair share” (much more, more, or a fair share on the original response scale), partners who did “less than fair share” and partners who did “much less than fair share”. For the items relating to the degree of encouragement or discipline partners provided around food and mealtimes, the five point response scale was also reduced to three categories. Mothers who reported that their partner ‘almost always’ encouraged their children to eat disliked foods were categorised as having “strongly encouraging” partners and mothers who reported ‘often’ or ‘sometimes’ were considered to have “encouraging” partners. Mothers who responded that their partner ‘rarely’ or ‘never’ encouraged their children were categorised as having “low or no encouragement” partners. Similarly, families were categorised according to the degree of support mothers received from partners in disciplining children during meal times, with analogous categories of “strongly disciplining”, “disciplining”, or “low or no discipline” partner derived.

**Table 7.1: Child weight status by partner's sharing of family responsibilities, for two parent families**

Reported sharing by partner	Normal weight child n (%)	Overweight or obese child n (%)	P <sup>1</sup>
Partner's sharing of domestic tasks (n=261)			
At least fair share	120 (79.0)	32 (21.1)	0.01
Less than fair share	76 (88.4)	10 (11.6)	
Much less than fair share	14 (60.9)	9 (39.1)	
Partner's sharing of childrearing tasks (n=261)			
At least fair share	163 (81.5)	37 (18.5)	0.16
Less than fair share	42 (80.8)	10 (19.2)	
Much less than fair share	5 (55.6)	4 (44.4)	
Partner's role in encouraging child to eat disliked foods (n=246)			
Strongly encouraging	59 (84.3)	11 (15.7)	0.75
Encouraging	66 (80.5)	16 (19.5)	
Low or no encouragement	75 (79.8)	19 (20.2)	
Partner's role in disciplining children at the table (n=247)			
Strongly disciplining	73 (85.9)	12 (14.1)	0.36
Disciplining	66 (78.6)	18 (21.4)	
Low or no discipline	61 (78.2)	17 (21.8)	

1: P-value based on Chi-square test

For the variable measuring partner share of domestic tasks there was a significant association with child weight status. In families where the mother's partner did much less than their fair share of domestic tasks, 39% of children were overweight or obese. In families where partners did their fair share, the proportion of overweight or obese children was 21%. The association between partner's sharing of childrearing tasks and weight status was not entirely consistent with that for domestic tasks, but the proportion of overweight or obese children was highest in families where partners did much less than their fair share.

Although not significant, for the two variables measuring partner involvement with children's eating behaviours, there appeared to be a distinction between the prevalence of overweight or obesity in partners who were strongly encouraging or strongly disciplining and that for partners who had less involvement in meal time behaviour.

**Table 7.2: Partner's sharing of family responsibilities by SES group, for two parent families**

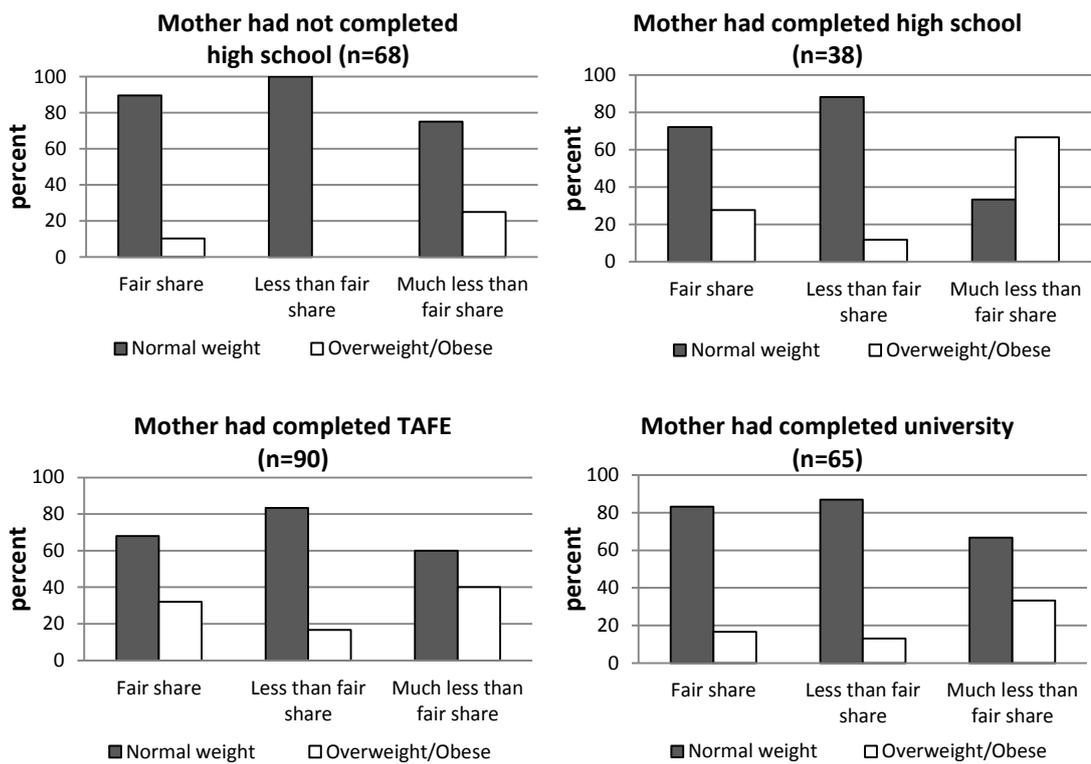
Reported sharing by partner	Maternal educational attainment				<i>P</i>
	Incomplete high school n (%)	Completed high school n (%)	Completed TAFE n (%)	Completed university n (%)	
Partner's sharing of domestic tasks (n=261)					
Fair share	48 (70.6)	18 (47.4)	50 (55.6)	36 (55.4)	0.27 <sup>1</sup>
Less than fair share	16 (23.5)	17 (44.7)	30 (33.3)	23 (35.4)	
Much less than fair share	4 (5.9)	3 (7.9)	10 (11.1)	6 (9.2)	
Partner's sharing of childrearing tasks (n=261)					
Fair share	51 (75.0)	29 (76.3)	71 (78.9)	49 (75.4)	0.98 <sup>1</sup>
Less than fair share	14 (20.6)	8 (21.1)	17 (18.9)	13 (20.0)	
Much less than fair share	3 (4.4)	1 (2.6)	2 (2.2)	3 (4.6)	
Partner's role in encouraging child to eat disliked foods (n=246)					
Strongly encouraging	15 (25.9)	9 (25.0)	32 (35.2)	14 (23.0)	0.74 <sup>2</sup>
Encouraging	21 (36.2)	12 (33.3)	28 (30.8)	21 (34.4)	
Low or no encouragement	22 (37.9)	15 (41.7)	31 (34.1)	26 (42.6)	
Partner's role in disciplining children at the table (n=247)					
Strongly disciplining	18 (31.0)	10 (27.8)	37 (40.7)	20 (32.3)	0.61 <sup>2</sup>
Disciplining	19 (32.8)	16 (44.4)	26 (28.6)	23 (37.1)	
Low or no discipline	21 (36.2)	10 (27.8)	28 (30.8)	19 (30.7)	

1: P-value based on Fisher's exact test

2: P-value based on Chi-square test

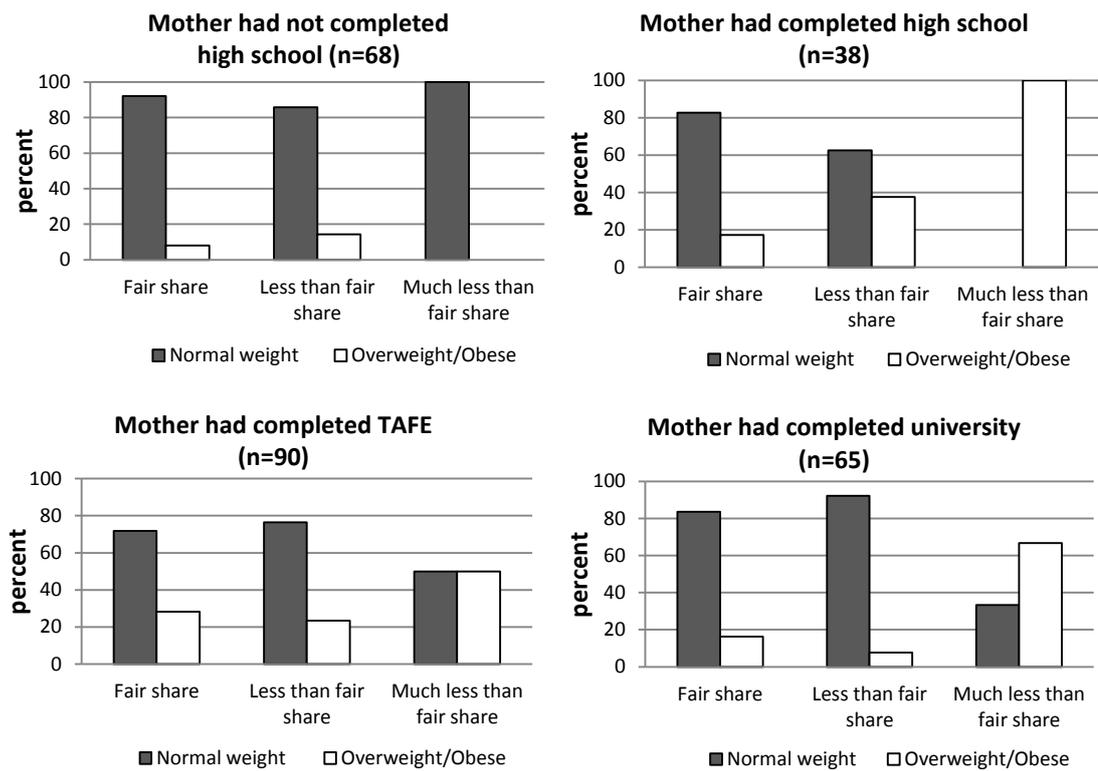
When each of the four items was stratified by SES, there was no consistent pattern of results. Partners in lowest SES category were reported to be most likely to do at least their fair share of domestic tasks (71%), compared to only half of partners in all other SES groups.

**Figure 7.2: Child weight status by partner's sharing of domestic tasks within SES groups, for two parent families**



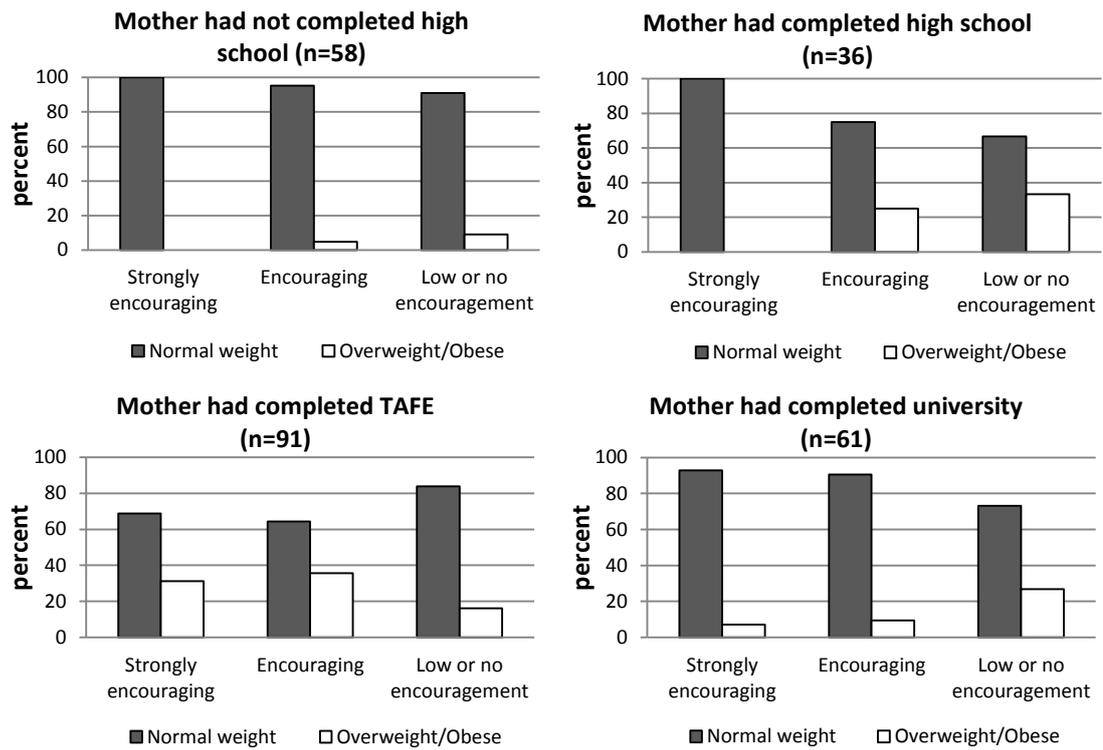
When stratified by SES, there were no significant associations between extent of sharing of domestic tasks and child weight status although the association was marginally significant (Fisher's exact  $P=0.10$ ) for families where the mother had completed high school. Consistent with the overall pattern, in all families within each SES group, child overweight/obesity was more common when the partners did much less than their fair share of domestic tasks.

**Figure 7.3: Child weight status by partner's sharing of childrearing tasks within SES groups, for two parent families**



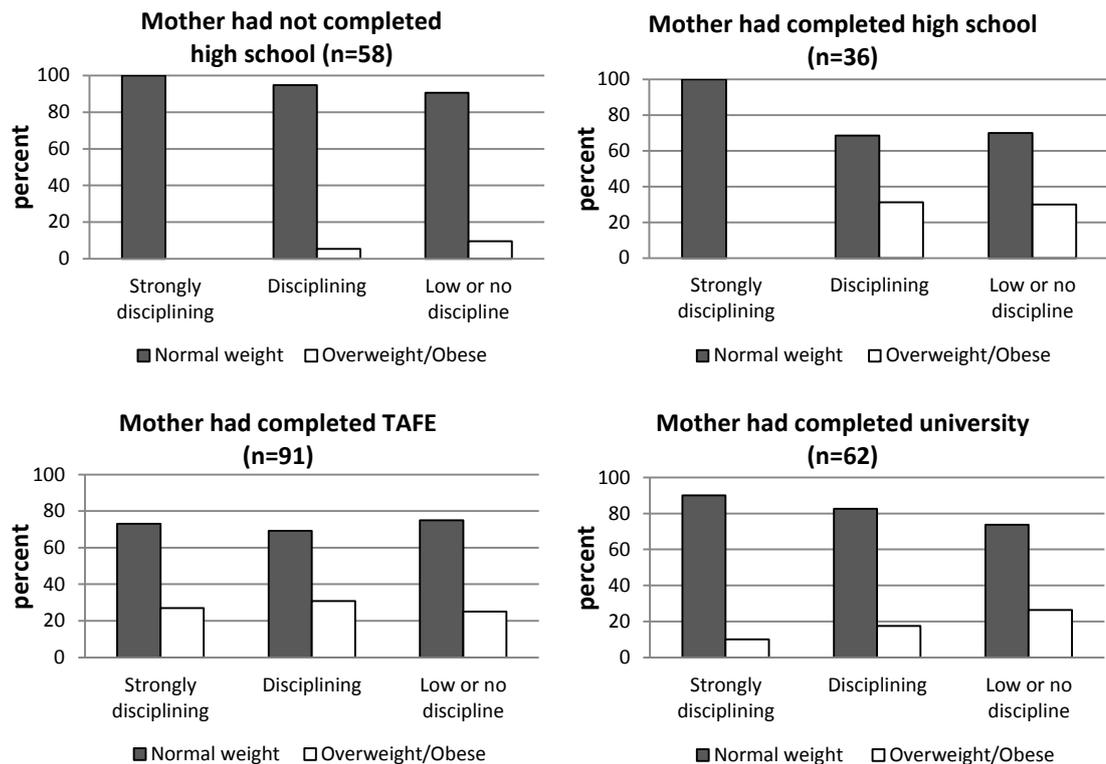
When stratified by SES, there was a marginally significant association between partner's sharing of childrearing tasks and child weight status in families where the mother had completed high school or mothers had completed university, such that children were more likely to be overweight/obese where partners did much less than their fair share. However, small cell counts mean these results must be viewed with caution.

**Figure 7.4: Child weight status by partner's role in encouraging children to eat disliked foods within SES groups, for two parent families**



When stratified by SES, there were no statistically significant associations between the degree to which partners encouraged eating of disliked foods and child weight status in families. In three of the four SES groups, child overweight or obesity was most common in household where partners were not encouraging.

**Figure 7.5: Child weight status by partner's role in disciplining children at the table within SES groups, for two parent families**



When stratified by SES, there were no significant associations between the degree to which partners took a role in disciplining children at the table and child weight status. In general, there was some suggestion that low discipline at the table by partners was linked to child weight status.

Logistic regressions corresponding to each of Figures 7.2 through 7.5 that included interaction terms between SES and the aspect of partner support under consideration each failed to converge.

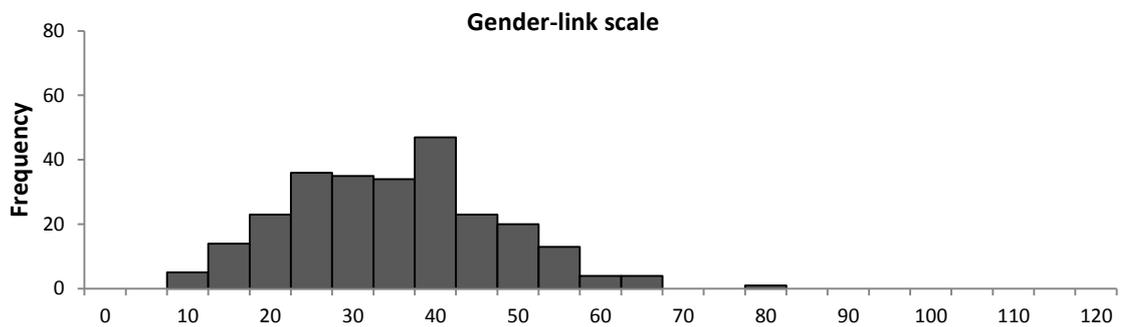
## **7.2 Gender roles, socio-economic status, and child weight status**

The SRQ was used in the interviews to assess mothers' gender-role attitudes, as described in Section 3.2. To recap, the SRQ is a 13 item questionnaire (see Table 3.5) designed to capture individuals' attitudes regarding social roles in contemporary society. The questionnaire can be used to derive two scales. The gender-link scale (8 items) assesses the degree to which a respondent supports a gendered division of social roles. The gender-transcendence scale (5 items) assesses the degree to which a respondent believes the division of social roles should be related to gender. A high gender-link scale score would suggest greater support for a traditional division of social roles by gender. A high gender-transcendence score would indicate a belief that social roles should not be closely related to gender. As the authors provided limited guidance in the use of the SRQ (Baber, 2009, personal communication), a system of scoring maternal responses to the SRQ was developed for this thesis (Section 3.4.8).

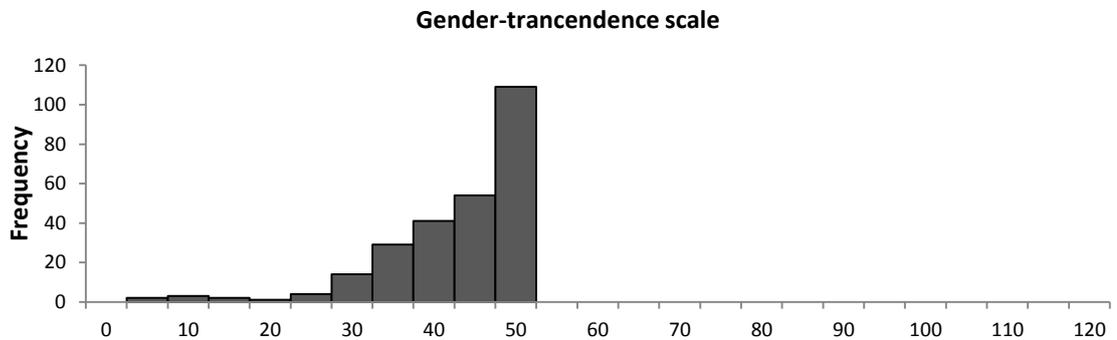
A total of 259 partnered women completed the SRQ. As shown in the histograms in Figure 7.6, the distribution of responses to the gender-link scale was approximately normal, whereas the distribution of responses to the gender-transcendence scale was markedly skewed (Figure 7.6 panes a and b). To accommodate for the skew of the gender-transcendence scale, non-parametric tests (Mann-Whitney) were used to examine associations with child weight status, with SES, and with child weight status within SES groups.

**Figure 7.6: Distribution of maternal responses on gender-link scale and gender-transcendence scale from Social Roles Questionnaire**

a)



b)



There were no statistically significant associations between mother's scores on the gender-link or gender-transcendence scales and child weight status.

**Table 7.3: Child weight status by mother's views on gender roles, for two parent families (n=259)**

	Normal weight child (n=208)	Overweight or obese child (n=51)	<i>P</i> <sup>2</sup>
	Median (IQR <sup>1</sup> )	Median (IQR)	
Gender-link score	33.0 (23.5, 40.0)	37.0 (24.0, 46.0)	0.20
Gender-transcendence score	44.5 (37.0, 49.0)	43.0 (38.0, 48.0)	0.67

1: Inter-quartile range: 25<sup>th</sup> and 75<sup>th</sup> percentiles

2: P-value based on Mann-Whitney test

**Table 7.4: Mother's views of gender roles by SES groups, for two parent families (n=259)**

	Mother's educational attainment				<i>P</i> <sup>2</sup>
	Incomplete high school (n=67) Median (IQR <sup>1</sup> )	Completed high school (n=37) Median (IQR)	Completed TAFE (n=90) Median (IQR)	Completed university (n=65) Median (IQR)	
Gender-link score	35.0 (24.0, 41.0)	37.0 (24.0, 44.0)	35.0 (26.0, 44.0)	29.0 (22.0, 36.0)	0.01
Gender-transcendence score	41.0 (34.0, 49.0)	42.0 (38.0, 47.0)	44.0 (38.0, 49.0)	45.0 (40.0, 49.0)	0.18

1: Inter-quartile range: 25<sup>th</sup> and 75<sup>th</sup> percentiles

2: P-value based on Kruskal-Wallis test

As shown in Table 7.4, there was a significant difference in the median gender-link scores across SES categories. Mothers who had completed university reported the lower median gender-link scores than mothers in the other SES categories. High school educated mothers reported the highest median gender-link scores of all SES categories. Although not significant, there was an inverse association between median gender-transcendence scores and SES categories.

**Table 7.5: Child weight status and mother's views on gender roles within SES groups, for two parent families**

	Normal weight child		Overweight or obese child		<i>P</i> <sup>2</sup>
	n	Median (IQR <sup>1</sup> )	n	Median (IQR)	
Incomplete high school					
Gender-link score	61	35.0 (24.0, 41.0)	6	33.5 (29.0, 39.0)	0.96
Gender-transcendence score	61	41.0 (34.0, 48.0)	6	43.5 (30.0, 50.0)	0.82
Completed high school					
Gender-link score	28	36.0 (23.5, 42.5)	9	37.0 (24.0, 46.0)	0.67
Gender-transcendence score	28	43.0 (38.0, 46.0)	9	40.0 (38.0, 48.0)	0.85
Completed TAFE					
Gender-link score	65	35.0 (27.0, 43.0)	25	39.0 (25.0, 47.0)	0.51
Gender-transcendence score	65	45.0 (38.0, 49.0)	25	44.0 (40.0, 47.0)	0.57
Completed university					
Gender-link score	54	28.5 (21.0, 34.0)	11	35.0 (23.0, 40.0)	0.26
Gender-transcendence score	54	45.5 (41.0, 49.0)	11	43.0 (37.0, 50.0)	0.39

1: Inter-quartile range: 25<sup>th</sup> and 75<sup>th</sup> percentiles

2: P-value based on Mann-Whitney test

When stratified by SES, there were no statistically significant associations between mother's responses on either the gender-link or the gender transcendence scale and child weight status. However, data consistently suggested that, for all but the lowest SES group, median scores on the gender-link scale were higher for mothers of overweight/obese children than for mothers of normal weight children. Similarly, for all but the lowest SES group, median scores on the gender-transcendence scale were lower for mothers of overweight/obese children than for mothers of normal weight children. This trend was most pronounced for families in the highest SES group. These results must be interpreted with caution due to small samples sizes within comparison groups.

Logistic regressions were performed to determine if there were any interactions in relation to child weight status: between gender-link score and SES; between gender-transcendence score and SES; and in a model that include both scores and SES. No significant interactions were identified in the first two models and the third failed to converge.

### **7.3 Summary**

This chapter investigated relationships between parental sharing of family responsibilities in the domestic realm and child weight status. Associations between mother's attitudes towards gender roles and child weight status were also investigated.

The sharing of domestic tasks was significantly associated with child weight status: where fathers did much less than their fair share children were most likely to be overweight/obese. There was evidence that this contributed to child overweight/obesity specifically in families where mothers held a TAFE qualification. While the pattern was similar in other SES groups, associations were not statistically significant.

A similar trend (not statistically significant) was observed for sharing of childrearing tasks. Overall, there was no association between the partner's role in encouraging children to eat disliked foods or in disciplining children at the table with child weight status. However, there was some indication that where partners were strongly encouraging or strongly disciplining, children were less likely to be overweight or obese. Sparse data in some cells limited the ability to examine SES variations.

Overall, the extent to which mothers endorsed traditional gender stereotypes or supported transcending stereotypes were not significantly associated with child overweight/obesity, although mothers of overweight/obese children appeared to have higher gender-link scores. Gender-link scores varied with SES, such that university educated mothers did not endorse traditional gender stereotypes to the same extent as other mothers. While there were no statistically significant findings within SES groups, the data suggested that mothers of overweight/obese children had higher gender-link scores than mothers of overweight children, most pronounced in the highest SES group.

## Chapter 8: Discussion

In this chapter a summary of thesis findings will be presented and possible interpretations of results contemplated with reference to the extant literature. The strengths and limitations of the study design and tools of measurement are also considered. Implications of the most robust findings are discussed as well as directions for future research.

### 8.1 Summary of findings

#### 8.1.1 Prevalence and socio-economic distribution of child overweight/obesity

Using the IOTF definitions of child overweight and obesity, the prevalence of child overweight in the study sample was 16% and a further 4% of children were categorised as obese (Chapter 4). Combined, the prevalence of child overweight/obesity was 20%. While this prevalence estimate was obtained from a modest sample of early responders to a larger survey, it nevertheless concords with recent Australian child overweight/obesity prevalence studies of much larger scale (see Table 1.1, Chapter 1).

Child overweight/obesity was significantly associated with maternal education, but for this sample the association did not follow a linear gradient: the highest prevalence was in the families where the mother had TAFE education. This outcome is in contrast with the findings presented in Chapter 1 (Section 1.6) concerning the association between SES and child overweight/obesity, where the relationship was generally inverse and graded. This unexpected pattern somewhat complicated the aim of identifying factors that explain the SES differential in child overweight/obesity.

The explanation for the highest prevalence of overweight/obesity in families where the mother had a TAFE qualification, rather than in families where the mother had not completed high school, may lie in the construction of this educational category. First, among the group of women with TAFE qualifications, around half had not completed high school. A focus on highest educational qualification obscures this difference in years of secondary education. Additionally, the qualifications that can be achieved through TAFE are diverse, ranging from base level skills (Certificate I) up to Graduate Diplomas. Details of the TAFE qualification held were not obtained from participants, thus mothers categorised as TAFE educated may have received vocational training (for example, to work as hairdressers, massage therapists, or childcare workers) or may have completed training that would allow them to work in professional occupations (for example, accountancy or nursing). Difficulties in selecting a useful indicator of SES for families with young children were outlined in Chapter 1 (Section 1.6) and this issue is an additional, unforeseen difficulty.

Another possible explanation for the prevalence of child overweight/obesity being lower for families where the mother had not completed high school than for families where the mother had a TAFE qualification may be the focus on the first 300 respondents to a larger survey. Early responders, especially in the lowest SES category, may be quite different from late responders. Families who were hard to trace, difficult to contact, or repeatedly rescheduled appointments were less likely to be included in the first 300 families (a point that will be elaborated upon in Section 8.2.3). Child overweight/obesity may be substantially more common in these families and thus the interim prevalence for families where mother had not completed high school may be an under-estimate.

It is worth noting that, in Australia, childhood obesity prevalence rates have possibly ceased to increase in higher SES groups while continuing to climb amongst children from low SES backgrounds (O'Dea and Dibley, 2010). That said, a US study released in 2010 reported a contrary phenomenon, with the prevalence of obesity rising fastest amongst children with the highest SES (Adler and Stewart, 2010). Adler and Stewart (2010) attribute their finding to an increasingly obesogenic environment, suggesting that the inverse SES gradient for obesity resulted from an early response to environmental factors amongst low SES populations.

#### *8.1.2 Food-related parenting beliefs and practices and child overweight/obesity*

In Chapter 5 associations between food-related parenting beliefs and practices and child overweight/obesity were investigated. As detailed in Chapter 2, lenient parenting and lack of negotiation or boundary setting, especially around food, have been suggested to increase the likelihood of overweight and obesity in children (Rosenkranz and Dziewaltowski, 2010; Skouteris et al., 2012).

A factor analysis generated three subscales from 10 items: Obliging, Influence and Firmness. Only Obliging was significantly associated with child weight status, with mothers who endorsed more lenient food-related beliefs and practices significantly less likely to have a child who was overweight/obese. This outcome was the reverse to the finding expected based on the majority view in the literature.

Mother's scores for the Obliging, Influence and Firmness scales were not significantly associated with SES, although it appeared that mothers who had not completed high school were more obliging and less firm than other mothers. When the association between the Obliging score and child overweight/obesity was examined within SES strata, it was statistically significant for families with TAFE educated mothers but no other SES groups.

A number of considerations are relevant when attempting to interpret these findings. First, it must be acknowledged that the 10 items underpinning the analyses may not be adequately characterising the food-related beliefs and practices of mothers. A questionnaire was specifically developed for this project

(see Section 3.2) due to the lack of existing tools that covered the issues identified in the literature review. The questionnaire was not formally tested for validity or reliability and was piloted using only a small sample of mothers. Greater investment in questionnaire development was not feasible due to resource and time constraints.

It is possible that the finding in relation to the Obliging scale is a product of social desirability bias. That is, the mothers of overweight/obese children may think they should exhibit more control over their child's diet and eating behaviour than they actually do and this may have influenced the way mothers reported their food-related beliefs and practices. The observed association between food-related beliefs and practices and child weight status among TAFE educated mothers, but not for others, may further point to social desirability bias. It is possible that the TAFE educated women have the greatest middle-class aspirations and knowledge of intensive parenting ideologies, and thus are the most sensitive to what researchers think about them.

An alternative interpretation is that these findings are accurate, but describe mothers' current practices and not necessarily their historical parenting beliefs and practices. That is, the parents of overweight/obese children may have reacted to their child's weight, and changed their beliefs and practices so as to be setting limits at the time of the interview. The inability to disentangle this issue is a limitation of cross-sectional research, which will be elaborated subsequently (Section 8.2).

It is also possible that authoritarian (i.e. not obliging) food-related beliefs and practices contribute to child overweight/obesity, although this is a minority argument in the existing literature. Birch and colleagues (Birch and Fisher, 1996; Birch and Davison, 2001; Birch 2006) are the main proponents of the theory that parenting approaches in which children are pressured to eat and not given the opportunity to learn to respond to physiological cues to satiety will lead to obesity. From this perspective, less obliging parents might be most likely to have overweight/obese children. However, while the theories of Birch and colleagues remain relevant, in recent years it has become apparent that the relationship between child feeding practices and child overweight/obesity is highly nuanced and requires careful investigation to understand the pathways between food-related parenting practices and child eating patterns with specific contexts. As described in the literature review, many more authors have argued that low parental control and increased child food autonomy is associated with obesogenic child diets and a greater likelihood of child overweight/obesity, as children tend to prioritise taste over nutrition (Dixon and Banwell, 2007; Holsten et al., 2012).

The relationship between parenting practices and child overweight/obesity was recently reviewed by Sleddens et al. (2011). While the review found that studies had inconsistent findings, the authors broadly concurred with the theory that authoritative parenting practices were associated with healthier child behaviours and lower BMIs. Sleddens et al. (2011) conclude that parenting beliefs and practices are

difficult to measure and further research is needed to reach consensus on this topic. Australian researchers, Skouteris et al., (2012) also suggest further research in this area is needed, as effective child obesity prevention strategies will rely on an understanding of how interactions between parents and children contribute to child eating patterns.

On balance, it seems most likely that the results of analyses in Chapter 5 are either a social desirability finding or a result of changes in food-related parenting beliefs and practices subsequent to children becoming overweight or obese.

### *8.1.3 Parental employment patterns and child overweight/obesity*

In Chapter 6, aspects of parents' employment were examined: employment status, work schedules, and mother's satisfaction with work-life balance. This discussion focuses on two parent families as there were limited data to examine relationships for lone parent families.

In two parent families, child overweight/obesity was not related to the employment status of either parent (full-time, part-time or unemployed). A large proportion of the mothers in this study worked part-time (58%) or not at all (22%). These figures are similar to those for all mothers with children aged 6-14 years in Australia in 2010-11 (ABS, 2012). When stratified by SES, the association between maternal employment categories and child weight status was significant only for families where maternal educational attainment was high school completion. This was anomalous with the other SES groups in which there was a consistent trend of a greater proportion of overweight/obese children where mothers worked full-time. The latter trend is in line with the existing literature (e.g. Anderson, Butcher and Levine, 2003; Phipps, Lethbridge and Burton, 2006; Brown et al., 2010) and aligns with the findings on work-life balance of mothers (below).

Among two parent families, a third of employed mothers and half of employed partners worked family-unfriendly schedules. There was no significant association between mother's work schedule and child weight status. In contrast, when partners worked family-unfriendly schedules, children were significantly more likely to be overweight/obese than when partners did not. There was evidence that this factor contributed to the higher prevalence of child overweight/obesity in families where mothers held a TAFE qualification.

For a small proportion of families, both parents frequently worked family-unfriendly schedules and in almost half of these families children were overweight/obese. However, this did not explain SES differences in the prevalence of child overweight/obesity.

Partnered mothers who worked full-time had, on average, higher Work-life Interference scores (indicating poorer work-life balance) than mothers who worked part-time (44.3 and 33.1, respectively). A similar

finding was reported for women interviewed for the 2010 Australian Work and Life Index study (Skinner and Pisaniello, 2010), where average Work-life Interference scores were 45.7 for full-time working women and 40.0 for part-time working women. In two parent families, mothers of overweight/obese children had poorer work-life balance than mothers of normal weight children (borderline statistical significance). This did not appear to be a factor contributing to overweight/obesity in the disadvantaged families. However, it appeared to contribute to the occurrence of overweight/obesity in children in families where the mother held a university degree (borderline statistical significance).

There were too few lone parent families to support detailed analyses and robust interpretation of results. However, similar to the two parent families, lone mothers of overweight/obese children had significantly higher Work-life Interference scores than mothers of normal weight children.

Both older literature and recent studies (e.g. Brown et al., 2010) suggest that mother's employment status would be associated with child overweight/obesity. A trend in line with the literature was apparent in data presented in this thesis. The lack of a significant association may reflect the fact that mothers in the study sample, who were early responders, had made adjustments in their lives that permitted them to manage both work and family commitments better than mothers in past decades or in a more representative sample of contemporary mothers.

Mother's work schedule was not associated with child weight status (except where both parents had a family-unfriendly schedule). Mother's schedule may have a minimal effect on child weight status in families where the mother has actively chosen to work non-standard hours. Results from the Household, Income and Labour Dynamics in Australia (HILDA) survey suggest 'work-to-family strain' reflects satisfaction with work hours and flexibility of work schedules (Alexander and Baxter, 2005). Some mothers choose to work non-traditional hours to allow a better balance between work and family responsibilities and to reduce childcare costs (Strazdins et al., 2004; Strazdins et al., 2006). Information is not available in the current study about whether mothers had chosen their work schedule.

The relationship between partners' employment patterns and child overweight/obesity has received limited attention in the existing literature, thus this focus is a relatively novel aspect of this thesis. While several studies have found no association between father's work schedule and child weight status (Phipps, Lethbridge and Burton, 2006; Courtemanche 2007, 2009; Hawkins, Cole and Law, 2008), a recent study by Benson and Mokhtari (2011) demonstrated that longer paternal work hours (i.e. a family-unfriendly schedule according to the definition used in this thesis) were associated with higher child BMI.

Phipps, Lethbridge and Burton (2006) and Courtemanche (2007) suggest the lack of association between paternal work hours and child health in earlier studies may reflect fathers historically having a limited role in parenting and food provisioning. Craig and Powell (2011) suggest fathers' unfriendly work schedules

may now have a considerable impact on family functioning via decreased support for mothers, in an era where mothers typically work and expect fathers to contribute to family responsibilities. Potential associations between degrees of partner support in managing family responsibilities and child weight status are discussed subsequently (Section 8.1.4). It is not clear why this may be most important for families where the mother had TAFE qualifications.

The few studies that have investigated parents' combined work schedules have reported findings largely consistent with the results presented in this thesis. A very recent review by Li et al. (2012) examined parents' non-standard work hours and child health outcomes, including obesity. The review concluded that there was evidence linking parents' non-standard work schedules to adverse child outcomes, particularly in disadvantaged families where non-standard work hours are most common.

There was some evidence that poor work-life balance of mothers contributed to child overweight/obesity, especially for families in the highest SES group. There is a lack of comparable research in the existing literature (see Li et al., 2012). Slater et al. (2012) demonstrated that poor maternal work-life balance contributes to childhood obesity because mothers rely on convenience foods to minimise the time spent on food preparation. In a US study, Bauer et al. (2012) demonstrated that parents who experienced stress as a result of their work have poor diets compared to other working parents.

Information on partner's work-life balance was not available. The overall results suggest that, at this stage of their child's life, mothers are generally putting family ahead of career; fathers do not. However, further investigation is required to demonstrate if partner's work-life balance is associated with child overweight/obesity

Finally, the finding that family-unfriendly work schedules of the partner contributed to a higher prevalence of child overweight/obesity most clearly in families where the mother held a TAFE qualification, whereas poor work-life balance of the mother was linked to child overweight/obesity in the highest SES group, potentially points to a different set of strategies being used by families in different social circumstances to compensate (or not) for the lack of work-related time pressure.

#### *8.1.4 Sharing of family responsibilities, gender roles, and child overweight and obesity*

The sharing of domestic tasks was significantly associated with child weight status: where fathers did much less than their fair share children were most likely to be overweight or obese. This finding was not confined to any particular SES group and there was no evidence that this explained SES disparities in child overweight/obesity. A similar trend overall (not statistically significant) was observed for sharing of childrearing tasks; the relatively small cell sizes for some combinations meant that SES variations could not be examined in detail.

Of note, partners in the lowest SES group were allegedly more likely to do at least their fair share of domestic task (71%) compared to other SES groups (47-57%). While this difference was not statistically significant, it does raise questions about the nature of the early responders and possible reasons for the lower than expected prevalence of child overweight/obesity in this group.

The extent to which fathers specifically encouraged children to eat disliked foods or had a role in disciplining children at the table were not significantly associated with child weight status. However, there was some suggestion that strong encouragement and strong discipline at the table by partners may contribute to a lower likelihood of overweight or obesity in children. Again, the relatively small sample size limited the power to detect associations as statistically significant.

The Social Roles Questionnaire (SRQ) was used to characterise mother's beliefs about gender roles. Overall, neither the extent to which mothers endorsed gender role stereotypes, nor the extent to which mothers supported transcending stereotypes, were significantly associated with child overweight/obesity. However, in line with the hypotheses, mothers with overweight or obese children appeared to report greater support for a traditional division of social roles by gender and less gender transcendent attitudes than the mothers of normal weight children. Gender role beliefs were related to SES groups, with university educated mothers having the lowest traditional and the highest transcendent scores. Correspondingly, the largest difference between means for mothers of normal weight and overweight/obese children was observed for this SES group. Thus there may be a link between SES and gender role beliefs operating at the upper end of the SES spectrum.

A number of considerations are relevant when attempting to interpret these findings. There would appear to be some limitations in the questions used to assess sharing of family responsibilities. The wording seems to invite a degree of social desirability bias, and this may be compounded by the limited range of options in the five-point response scale (a ten-point scale, for example, might have resulted in greater separation of responses). Consistent with this are the observations of Craig (2007a; Craig and Siminski, 2010) which suggest that mothers are generous towards their partners in reporting of fairness.

Similarly, the SRQ is likely to be subject to social desirability bias. If this was more common among women in lower SES groups, it would obscure expected results in line with the hypotheses. A recent publication has suggested that traditional gender role beliefs are 'unfashionable', so respondents are unwilling to acknowledge that they hold implicit men-agentic/women-communal beliefs (Kite, Deaux and Haines, 2008). Additionally, some of the mothers in the Generation 1 study appeared to interpret the questionnaire items inconsistently, reporting an incompatible mixture of traditional and non-traditional beliefs. This could mean that some of the SRQ items have poor face validity which may especially affect the responses of the women in the lower SES groups.

It is also important to note that mothers may not be in a position to put into practice egalitarian gender role beliefs if their partners are unsupportive or unwilling to take on more responsibility for domestic and childrearing tasks.

There is evidence that within two parent families in Australia, having children increases the gendered division of labour in families (Bianchi et al., 2012). Internationally, while men are now more committed to the ideology of involved fathering (Yoshida, 2012), there is still little evidence that this translates to increased practical responsibility as the gendered division of labour actually practised in families remains the same as it was over 15 years ago (Cotter, Hermsen and Vanneman, 2011; Craig and Powell, 2012). While a measure of partner's beliefs concerning gendered social roles might have provided additional insights - since there evidence that the gender ideologies held by male partners have most influence on what occurs in families (Davis and Greenstein, 2009) - the likely mismatch between men's rhetoric and reality may still have led to weak associations with child overweight/obesity.

An exploration of the ways that work patterns of parents intersect with sharing of parental responsibilities and gender role beliefs was beyond the scope of this thesis, but would be a worth undertaking in a larger sample. An egalitarian division of domestic and childrearing labour is difficult to achieve when women hold less economic power than their partners. As Craig and Powell (2012) note, in Australia, a substantial gender pay gap persists (elaborated upon in Section 8.3) and this structural factor may underlie the preliminary findings in both of these domains.

## **8.2 Study strengths and limitations**

This thesis is based on a cross-sectional survey, nested within a cohort study. In general, cross-sectional surveys are used to describe a population and determine the associations between variables at one point in time (Mann, 2003).

However, cross-sectional designs have some limitations. Notably, it is not possible to conclusively establish the temporal relationships between variables, or causality (Gordis, 2004; Barros et al., 2003). For example, when examining the association between mother's food-related parenting beliefs and practices and child weight status, this limitation of cross-sectional research was apparent. Farrow and Blissett (2008) have also pointed out this limitation, and recommend longitudinal studies to better understand relationships between parenting practices and child overweight/obesity.

The analyses reported in this thesis were derived from a subsample of 300 families who were members of an existing cohort. While ideally a random sample of South Australian families would have been recruited

for the purposes of this study, due to lack of funds this was not feasible. Deriving a study sample from an existing cohort of South Australian families was deemed an appropriate alternative.

Broadly, the Generation 1 cohort is concerned with child growth and development. Thus this thesis was an appropriate extension of the study and both mothers and children were comfortable and familiar with the nature of the anthropometric measurements. Children were aged 9-10 years at the time of the interview, ideal for the focus of this thesis in several respects. Almost all children would have completed adiposity rebound (generally 5-7 years) but not commenced adolescent growth (Cameron and Demerath 2002) and were unlikely to have begun pubertal transition (Patton and Viner, 2007). Children were young enough for parents to have ultimate responsibility for what they ate, while issues of child autonomy in relation to food were gaining importance.

The decision to use an existing cohort may have resulted in some limitations. At the time of initial recruitment, the Generation 1 cohort was considered to be broadly representative of the wider South Australian population of women giving birth in terms of their age, relationship status, education level and household income. Additionally, children born to mothers enrolled in the study were found to be similar in terms of birth weight to other children born in South Australia at that time (Moore et al., 2004). This is a reflection of the high quality sampling and recruitment strategies. Furthermore, response proportions for waves of follow-up in early childhood exceeded 90%, reflecting a large investment in building rapport with families. That said, it is possible the sample used in analyses presented here is not entirely representative of contemporary South Australian families, due to some attrition and the need to use a subsample comprising early responders. In particular, in the 300 families for which analyses are presented, it is possible that there were slightly more two parent families and more working mothers than for South Australia in general (see ABS, 2006, 2008, 2011). The ethnic background of the study sample was more compressed than in the wider population of South Australian children as it comprised of only Caucasian families. However, there are no directly comparable official statistics for families with children of the same age.

An additional consideration is the restriction of analyses to the first 300 families interviewed. Early responders are known to be more motivated than late responders (Stang and Jöckel, 2004) but may also be most subject to social desirability bias (Watson 2007). Also of relevance to the hypotheses in this thesis is that late responders may be most time poor (Brackertz, 2007).

These limitations must be balanced against the knowledge that there would have been considerable difficulty in achieving high participation in a representative survey of families initiated specifically for this thesis. There is an increasing apprehension in the community around participating in studies of obesity, especially on the part of parents with overweight/obesity children (Mellor, Rapoport and Maliniak, 2008).

This focus of this thesis tended to be two parent families, particularly for the second and third sets of analyses. This was partly due to the nature of the research questions, and partly due to the small number of lone parent families in the sample. Thus the research provides limited insights as to the reasons for child overweight/obesity in lone parent families.

Finally, it must be acknowledged that obesity is a complex health problem influenced by many factors other than those considered here.

### **8.3 Implications of this research**

The first set of analyses suggested that mothers who had less obliging food-related beliefs and practices were *more* likely to have an overweight or obese child. However, this result is considered most likely to be either an indication of mothers becoming stricter in response to their child's weight status or a product of social desirability bias. This interpretation is consistent with very recent literature which indicates that food-related parenting practices that incorporate negotiation with children are most effective to help children maintain a healthy weight (Sleddens et al., 2011). Therefore the main implication of this finding is to underscore a need for longitudinal research.

The strongest research finding in this thesis is that when the partner of the study mother worked unfriendly schedules, children were most likely to be overweight or obese. While this did not appear to explain the higher prevalence of overweight/obesity in the lowest SES group, it was relevant to child overweight/obesity in families where the mother held TAFE level qualifications. It is important to remember that the category of families wherein the mother held TAFE level qualifications included a mixture of quite disparate families. A second finding from this set of analyses was that mothers who reported poorer work-life balance were (marginally) more likely to have an overweight or obese child. This appeared to be most relevant to families in the highest SES group.

The data collection method used for this project was appropriate to address the study aim of identifying evidence of a broad social patterning of child weight status. The theories put forward by the extant literature help to explain the relationships apparent in the analyses, but as the findings presented in chapters 5, 6 and 7 are limited, this work may benefit from follow-up qualitative analyses within the study sample of families, to identify the specific mechanisms underlying the social patterning of child overweight/obesity. Qualitative studies investigating the home food environment have been previously undertaken in the Australian setting and this investigation was intended to be an extension of recent qualitative research.

Although identifying the explicit pathways between partner's work schedules, mother's work-life balance and child weight status was not within the scope of this thesis, the extant research suggested a number of

potential pathways (Chapter 2). In general, when partners work family-unfriendly schedules, mothers (the majority of whom work) are less supported at home in managing childrearing and domestic tasks. The most recent literature continues in this vein. For example, Miller and Han (2008) argue that the division of labour is most unequal within Australian families where the father works non-standard hours.

Unsupported mothers may resort to serving children pre-prepared meals to minimise the time they must spend preparing food (Jabs et al., 2007). Children in these households may also engage in more passive forms of leisure (e.g. TV, electronic games) due to difficulties supervising children when they play out-of-doors (Miller and Han, 2008). Mothers have also been shown to encourage passive leisure in children while they complete household tasks (Dorey et al., 2010).

Arguably, structural solutions are needed to address parents' problematic work schedules and work-life balance. There is a role for government, employers, employees and wider society in rectifying these aspects of current work environments.

Pocock and colleagues (2012) identified several areas that need improvement to promote employees' work-life balance. These include: ensuring employees are given reasonable (and predictable) work hours, with opportunities for flexible work hours that better align with employees' needs and preferences; setting realistic and achievable workloads; and providing practical support and resources for workers with caring responsibilities. Other Australian authors have made similar recommendations. Fujimoto, Azmat and Härtel (2012) indicate that the persistence of the 'ideal worker norm' - the expectation that workers will put their job commitments before their family responsibilities, as elaborated below - has reinforced the culture of excessive work hours and work intensification within Australian organisations. Additionally, the priority given by organisations to economic outcomes leads to understaffing, excessive workloads and unwillingness to effectively implement work-life balance solutions (Todd and Binns, 2011).

It is useful to recognise that the issues, and thus the remedies, may be different for different forms of employment. Charlesworth and Heron (2012) identified issues particular to casual and part-time workers. Casual and part-time work has become much more common in Australia since the 1990s, but these workers are often undervalued and left unprotected by current industry regulations.

Charlesworth and Heron (2012) recommend casual and part-time workers have access to statutory protections from unfair conditions, minimum work contracts with consistent hours, and fair penalty pay loading for unsocial hours. Bailey, Macdonald and Whitehouse (2012) also recommend strengthening the rights of the most vulnerable workers. Legislation for a reasonable minimum wage may further assist parents on low wages to avoid excessive work hours or holding multiple jobs simply in order to maintain a reasonable standard of living. Casual workers arguably need reasonable notification of changes in work schedules and the right to decline extra work hours without penalty (McCann, 2007; Bailey, Macdonald and Whitehouse, 2012; Australian Work + Family Policy Roundtable, 2012).

Contract or permanent workers, with specified hours per week and paid overtime for additional hours, have needs similar to those mentioned above. In addition, they may need greater flexibility in work schedules (Charlesworth and Campbell, 2008) and protection from excessive work hours, with the right to decline overtime hours without penalty (McCann, 2007). Current legislation permits parents the right to request flexible work hours, but falls short of ensuring organisations make a reasonable effort to accommodate requests, so Charlesworth and Campbell (2008) recommend an extension of federal regulations to ensure employees' preferences are genuinely considered.

For salaried employees who are not paid over-time, a shift towards organisations using a 'result-based' approach has meant that employees' hours are determined by the ability to fulfil allocated responsibilities, often resulting in long or inconsistent work hours. Unpaid overtime is a common problem for full-time Australian workers, with almost half reporting that unpaid overtime (required to meet excessive work demands) is "compulsory" or "expected" in their workplace (Fear and Denniss, 2009). To improve the situation for these workers, Skinner, Parvazian and Dorrian (2010) argue that employers need to recognise that it is not in their interest to compel employees to work excessive hours. Sustained long and intensive work hours represent an occupational health, safety and wellbeing hazard. A recent Australian study has shown that the expectation that employees will work excessive work hours is associated with increased absenteeism and low productivity (Holden et al., 2010). The wider consequences of poor work-life balance include a range of social costs in the form of negative outcomes for the health and wellbeing of individuals, their families and their community, with ramifications for economic productivity and societal functioning (Pocock, Skinner and Williams, 2012). Greater recognition of these adverse outcomes is required and could be pursued in the interests of public health.

As mentioned, the 'ideal worker norm' persists in Australia. The ideal worker is appropriately educated, mobile, work orientated, and willing and able to consistently work long hours, often supported by an economically dependent (female) partner who takes responsibility for all unpaid tasks (Ellem, 2005). Traditionally, men were often able to meet the criteria of an ideal worker as they were perceived to have negligible caring responsibilities (Bardoel et al., 2011) and the persistence of this norm means that long work hours are a particular issue for fathers. In contrast, women are perceived to have a lower commitment to employment (Kmec, 2011) and their caring responsibilities are taken more seriously by employers (Bardoel et al., 2011).

Fathers are disinclined to apply for flexible or shorter work hours (Bittman, Hoffman and Thompson, 2004), with three key reasons suggested for this: families rely financially on the father's wage, men are afraid that requests for flexibility will be perceived as a reduced commitment to work which may adversely affect their career trajectory, and the fathering role continues to be constructed as that of breadwinner and not as

caregiver. Kossek, Lewis and Hammer (2009) suggest both employees and employers need to challenge cultural mind-sets within organisations that support long work hours, especially for men.

Another finding within this thesis was that where mothers were largely unsupported by partners in completing domestic tasks, children were more likely to be overweight or obese. This finding did not appear to explain the socio-economic gradient of child overweight/obesity, but it is nevertheless worth reflecting on the implications.

Most families need two working parents to maintain a reasonable standard of living (Bryson and Mackinnon, 2000). However, a traditional gendered division of labour continues to be practised in most Australian two parent families (Chesters, Baxter and Western, 2009; Bardoel et al., 2011; Craig and Powell, 2011). The terms 'double-shift' and 'second-shift' have been used to describe the circumstance in which mothers undertake paid employment and also the majority of family responsibilities (Hochschild, 1989). There are a variety of pathways through which this circumstance could contribute to child overweight and obesity, similar to the pathways proposed above when mothers have poor work-life balance.

Addressing the imbalance in parents' responsibilities and roles would reduce the double-shift and its impact on child overweight/obesity. Arguably, as parenting is a joint responsibility, both mothers and fathers should have an equal opportunity to engage in parenting and paid work. Challenging the policies and structures that reinforce traditional stereotypes and gender roles for mothers and fathers is difficult, but would be necessary to achieve this on a broad scale.

Government policies continue to reward stay-at-home mothers and penalize working mothers, implicitly supporting the perception that mothers should be the primary caregiver of children. In addition, marginal tax rates that penalize secondary earners provide a considerable disincentive for mothers to work. There have been many calls for this to change (e.g. Summers, 2003; Bloodworth, 2004; Drago, Tseng and Wooden, 2004; Mendes, 2009; Cooke, 2010).

A substantial gender pay-gap persists in Australia (Gordon, 2012). The gender pay-gap is defined as the difference between the average wage of full-time male and female workers, with much of the difference attributed to factors unrelated to skills, experience, family situation or industry sector (Equal Opportunity for Women in the Workforce Agency, 2012). Several explanations have been put forward to account for this situation (see Tharenou, 2012). One explanation - at best incomplete - is that women tend to have fragmented education and employment histories due to competing roles across the life course, and as a result, are less skilled and less productive throughout their working careers. However, Cobb-Clark (2012) argue that the pay-gap between Australian high-income earners cannot be explained by disparities in skills alone. A second explanation is that in fields of employment dominated by women pay is generally lower

than for equivalently skilled jobs in fields dominated by men, because the former have not been able to negotiate better wages. Consistent with this explanation is the fact that relative wages in feminised occupations, such as aged care and child care, have declined in comparison to traditionally masculine occupations (Gordon 2012). Workers in the caring sector are thought to be especially limited in the ability to negotiate better wages as their jobs are both undervalued (Tharenou, 2012; Gordon, 2012) and priceless: the provision of care is perceived to be the natural role of women and should be done “for love instead of money” (Bardoel et al., 2011). Meanwhile, occupations dominated by men are valued and men in these fields feel more able to request higher wages (Tharenou, 2012). A third explanation is the “accumulation hypothesis” which suggests that women, throughout their careers, are incrementally discriminated against in terms of the career opportunities made available to them. Within fields occupied by both men and women, men are given more challenging jobs, more training and career development opportunities, and greater access to mentoring compared to women. Over the course of women’s careers, these factors aggregate to create a widening gender pay-gap (Tharenou, 2012).

Proposed solutions to the gender pay-gap include greater education, work experience, training and professional development opportunities for women (Tharenou, 2012) and increased wages in female dominated fields (Gordon, 2012). Additionally, Benard and Correll (2010) argue that discrimination against workers who are mothers, stemming from the assumption that mothers are less competent and less committed employees than non-mothers, needs to be identified and abolished. More generally, Tharenou (2012) argues that the gender pay-gap can only be closed when society refuses to tolerate lower wages for women and workers in feminised occupations.

Lastly, there has been an overall shift towards casualization of the Australian workforce, but the fields and occupations dominated by women have been disproportionately affected (Charlesworth and Heron, 2012). As previously noted, workers in these jobs are in a weak position to request flexible work hours or to challenge systems that penalise workers with caring responsibilities (Bardoel et al., 2011).

As well as challenging policies and other circumstances that maintain the male breadwinner model, more needs to be done to promote more equitable sharing of family responsibilities. To recap, the gendered division of labour in the domestic realm stems from an understanding that women are ‘natural’ and innate carers (Merskin 2008; Sutherland, 2010). This belief is implicit in the relatively recent style of mothering that is time consuming and intensive (Pedersen, 2012). Mothers experience considerable pressure to practice this style of mothering, irrespective of competing priorities (Hays, 2003; Sutherland, 2010). The pressure of meeting the expectations of intensive mothering beliefs has been associated with depression, feelings of guilt and stress amongst mothers (Rizzo, Schiffrin and Liss, 2012). In contrast, the same expectations are not made of fathers whose role is still construed as ‘supporting’ or ‘helping’ (Pedersen, 2012).

The intensive mothering ideology can leave working women feeling guilty for leaving their children while they earn an income (Sutherland, 2010). Society criticises mothers who are perceived to be abandoning their caring responsibilities, without offering much in the way of structural supports that would allow mothers to more comfortably combine employment with childrearing responsibilities (Johnson and Swanson, 2006). While some mothers are capable of reconciling their intensive mothering beliefs with employment (Christopher, 2012), to support mothers on a larger scale, across social groups, Milkie (2011) calls for society to recognise the detrimental impacts of the intensive mothering ideology has on mothers and families, and to develop policies that support equitable parenting. Likewise, Butler (2010) urges greater recognition of the two divergent roles women are now expected to fulfil: intensive mother and economic subject.

To increase the participation of fathers in caring for their children, fathers need to be *available*. This is inhibited by long working hours and the difficulties fathers face in requesting flexible work schedules (as previously outlined). The perception that fathers are only secondary carers has been perpetuated by government and industry policies that, while theoretically designed to support both parents in combining work with caring roles, are in practice invariably only available to mothers, such as paid parental leave (Bittman, Hoffmann and Thompson, 2004) and the right to request flexible work hours (Hegewisch, 2009). Changing the practical availability of these options is an important step.

Fathers also need to be actively *included* in the care of their children, by making parenting programs and services more inclusive of fathers. Historically, Australian fathers have felt that they lacked opportunities to be involved in their children's care and felt alienated by child health care service providers (Russell, 1999). Lack of support and recourse for fathers continues to be an issue for Australian fathers today (Fletcher and StGeorge, 2011). When fathers are encouraged to engage with children services, children have better health outcomes (Garfield and Isacco, 2012) and, as a result, some countries are currently seeking to develop more "father-friendly" policies (Sullivan et al., 2009). Australia is currently making some overtures in this direction (Bouma, 2012).

Finally, fathers need to be *expected* to be involved in the care of their children. While the 'new father' role has gained some traction amongst men in Western countries, this cultural shift has been more ideological than practical (Wall and Arnold, 2007) and fathers are sometimes lauded as 'involved' while still largely opting-out of many day-to-day childrearing responsibilities (Wall and Arnold, 2007; Gillies, 2009). Fathers are not socially penalised for their limited involvement because mothers are perceived to be superior carers and the fathering role is considered to be peripheral (Pedersen, 2012). However, some recent studies have shown that children with involved fathers have much better health, behaviour and education outcomes than other children (Sarkadi et al., 2008; Fletcher and StGeorge, 2011). These examples could be more widely publicised.

#### **8.4 Conclusion**

While the results of this thesis concerning food-related parenting beliefs and practices were limited, this underscores the need for longitudinal research, in which beliefs and practices are assessed before children become overweight or obese.

Work patterns of parents are an upstream factor contributing to child overweight/obesity. Family-unfriendly work schedules of fathers increases the likelihood of children being overweight/obese, and this is especially relevant for the SES group identified by the mother having a TAFE qualification. In a small proportion of families, both parents have unfriendly work schedules and this has a marked impact on child overweight/obesity, regardless of SES background. There was some evidence that poor work-life balance of mothers contributes to child overweight/obesity, especially for families in the highest SES group. Findings concerning parental sharing of family responsibilities were complementary, although not specific to any SES group. Where fathers did much less than their fair share of domestic tasks, children were most likely to be overweight/obese. There was suggestive evidence that where fathers took a strong role in shaping children's behaviour at the table, children were less likely to be overweight/obese.

While the findings of the thesis do not provide major insights about the excess of childhood obesity in the most disadvantaged families in society, they nevertheless point to the potential benefits for all families of family-friendly work schedules, satisfactory work-life balance and improved gender equity in fulfilling family responsibilities. Public health advocacy and initiatives around these matters is warranted for many reasons, not least the health of the children.

## **Appendix A: A review of Australian studies measuring the prevalence of childhood overweight and obesity**

A review of recent Australian studies of the prevalence of childhood overweight and obesity was undertaken (and updated early in 2012). Relevant reports of studies undertaken from 1985 (the year of the Australian Health and Fitness Survey) to 2011 were identified through searching the PubMed database and Google Scholar.

PubMed was searched initially using the search terms Australia\* AND child\* AND obesity AND prevalence. These terms were “any” word terms because the PubMed MESH terms search did not provide useful subheadings. Studies were included if they: were conducted in or after 1985; reported on a sample of children representative of the Australian population, or one or more of its states or territories, or a capital city; and were based on physical measurements (as opposed to self-reported height and weight data).

Twenty-one studies met the above criteria and are summarised in Table A.1. There were 10 national surveys, with sample sizes ranging from 1,709 (Australian National Iodine Nutrition Study, ANINS) to 13,858 (National Nutrition Survey, NNS).

All studies used the IOTF method to define overweight and obesity (using age- and sex-specific cut-offs). Study quality and factors affecting this are discussed after Table A.1.

**Table A.1: Australian child overweight/obesity prevalence studies conducted 1985 - 2011**

	<b>Study</b>	<b>Sample</b>	<b>Findings</b>			
1	<b>The Australian Health and Fitness survey 1985 (AHFS) - NSW sub-sample</b> May - Oct 1985  Booth, Dobbins, Okely, Denney-Wilson, Hardy (2007)	1,227 children aged 7 to 12 years.  State sample (NSW).	Boys Grade 2,4,6	Overweight% 9.0	Obese% 2.0	O+O% 11.0
			Girls Grade 2,4,6	Overweight% 11.9	Obese% 2.0	O+O% 13.9
2	<b>The National Nutrition Survey (NNS) 1995</b> Jan 1995 - Jan 1996  AIHW (2005)	2,382 children aged 2 to 14 years.  National sample.	Boys 2 - 4y 5 - 9y 10 -14y	Overweight% 14.6 10.4 18.3	Obese% 2.2 4.3 4.1	O+O% 16.8 14.7 22.4
			Girls 2 - 4y 5 - 9y 10 - 14y	Overweight% 18.5 14.9 16.9	Obese% 4.2 7.1 4.9	O+O% 15.6 19.8 22.5
	<b>The National Nutrition Survey (NNS) 1995</b> Jan 1995 - Jan 1996  Wang, Patterson, Hills (2002)	1,581 children aged 7 to 15 years.  National sample.	Boys 7 - 9y 10 - 12y 13 - 15y	Overweight% 10.6 16.0 16.0	Obese% 5.0 3.7 6.5	O+O% 15.6 19.8 22.5
			Girls 7 - 9y 10 - 12y 13 - 15y	Overweight% 17.9 20.9 11.0	Obese% 7.2 4.9 4.6	O+O% 25.1 25.7 15.6
	<b>The National Nutrition Survey (NNS) 1995 (child sub-sample)</b> Feb 1995 - Mar 1996 (as reported by Cook et al.)  Cook, Rutishauser, Seelig (2001)	13,858 children aged 2 to 18 years.  National sample.	Boys 2 - 18y 7 - 15y	Overweight% 15.0 15.3	Obese% 4.5 4.7	O+O% 19.5 20.0
			Girls 2 - 18y 7 - 15y	Overweight% 15.8 16.0	Obese% 5.3 5.5	O+O% 21.1 21.5
3	<b>The NSW Schools Fitness and Physical Activity Survey (NSWSPAS) 1997</b> Feb 1997 - Mar 1997  Booth, Macaskill, Lazarus, Baur (1999)	5,518 students from grades 2, 4, 6, 8 and 10.  State sample (NSW).	Boys Grade 2,4,6 Grade 8,10	Overweight% 15.0 15.6	Obese% 5.6 3.9	O+O% 20.6 19.5
			Girls Grade 2,4,6 Grade 8,10	Overweight% 16.6 15.2	Obese% 5.4 2.7	O+O% 22.0 17.9
4	<b>Western Australian Pregnancy Cohort Study (WAPCS)</b> 1997-1999 (not specified, assumed)  Burke, Beilin, Simmer, Oddy, Blake, Doherty, Kendall, Newnham, Landau, Stanley (2005)	1,430 children aged 8 years born in Perth between 1989 and 1992.  City sample (Perth).	Boys 8y	O+O% 15%		
			Girls 8y	O+O% 20%		
5	<b>The Health of Young Victorians Study (HOYVS) 1997</b> Sept - Dec 1997  Booth, Chey, Wake, Norton, Hesketh, Dollman, Robertson (2003)	2,221 children, aged 5 to 13 years enrolled in primary schools across Victoria.  State sample (Victoria).	Boys 7y 8y 9y 10y 11y 12y All years:	Overweight% 17.4 14.0 15.6 20.7 16.1 18.9 17.0	Obese% 2.6 5.9 5.7 6.6 3.9 6.7 5.2	O+O% 19.9 19.8 21.2 27.3 20.0 25.6 22.1
			Girls 7y 8y 9y 10y 11y 12y All years:	Overweight% 18.0 16.3 22.1 17.5 19.2 17.1 18.5	Obese% 9.3 5.4 4.8 6.1 4.8 1.3 5.7	O+O% 27.3 21.7 26.9 23.6 23.9 18.4 24.1

	Study	Sample	Findings			
6	<b>National Youth Cultures of Eating Study (NYCES) 2000</b> Sept - Dec 2000  O'Dea, Wilson (2006)	4,441 children aged 6 to 18 years.  National sample.	Overall	Overweight% 17.3	Obese% 6.4	O+O% 23.7
7	<b>The Health of Young Victorians Study (HOYVS) 2000</b> Sept - Dec 2000  Williams, Wake, Hesketh, Maher, Waters (2005)	1,456 children aged 9 to 12 years. The sample was drawn from the original cohort recruited for the Health of Young Victorians Study 1997.  State sample (Victoria).	Boys Girls Overall	Overweight% 19.2 21.3 20.2	Obese% 3.8 4.9 4.3	O+O% 23.0 26.2 24.5
8	<b>Children Living in Active Neighbourhoods (CLAN) 2001</b> July - Dec 2001  Timperio, Salmon, Telford, Crawford (2005)	1,210 child-parent dyads (291 families with 5-6 year old, 919 families with 10-12 year old children).  City sample (Melbourne).	Boys 5 - 6y 10 - 12y  Girls 5 - 6y 10 - 12y	Overweight% 15.1 22.1  20.9 22.2	Obese% 3.4 8.9  5.2 4.7	O+O% 18.5 31.0  26.1 26.9
9	<b>The Children's Leisure Activities Study Survey (CLASS) 2001</b> July - Dec 2001  Salmon, Timperio, Cleland, Venn (2005)	926 children in grades 5 and 6, aged 9-13 years.  City sample (Melbourne).	Overall 95% CI	Overweight% 21.6 20-24	Obese% 7.1 5-9	O+O% 28.7
10	<b>Australian National Iodine Nutrition Study (ANINS) 2003</b> July 2003 - Dec 2004  Li, Byth, Eastman (2007)	1,709 children aged 8 to 10 years. National sample.	Overall	Overweight% 18.5	Obese% 6.5	O+O% 25.0
11	<b>Unnamed study</b> 2003 - 2004  Sanigorski, Bell, Kremer, Swinburn (2007)	2,184 children aged 4 to 12 years living in rural Victoria.  State sample (Victoria).	Boys (se) Girls (se)  Overall (se)	O+O% 23.9±1.3 29.6±1.4  19.3±0.8	Obese% 7.6±0.6	O+O% 26.9
12	<b>The NSW Schools Physical Activity Survey (SPANS) 2004</b> Feb - May 2004  Booth, Dobbins, Okely, Denney-Wilson, Hardy (2007)	5,402 school students aged 4 to 16 years.  State sample (NSW).	Boys Grade 2,4,6 Grade 8,10  Girls Grade 2,4,6 Grade 8,10	Overweight% 18.5 19.4  17.6 16.2	Obese% 7.2 6.7  7.2 3.6	O+O% 25.7 26.1  4.8 19.8
13	<b>The Longitudinal Study of Australian Children (LSAC)</b> Mar - Sept 2004  Wake, Hardy, Canterford, Sawyer, Carlin (2006)	4,983 preschool children aged 4 to 5 years, born between March 1999 and Feb 2000.  National sample.	Overall 95% CI	Overweight% 15.2 14.1-16.4	Obese% 5.5 4.7-6.3	O+O% 20.7
14	<b>Unnamed</b> Aug - Sept 2004  O'Dea, Nguyen Hoang and Dibley (2011)	583 students in grades 4, 5 and 6.  State sample (NSW).	9 - 10y 11 - 12y	Overweight% 14.4 17.3	Obese% 9.4 6.3	O+O% 23.8 23.6
15	<b>The Health of Young Victorians Study (HOYVS) 2005</b> Sept 2005 - Dec 2006  Wake, Canterford, Patton, Hesketh, Hardy, Williams, Waters, Carlin (2010)	923 adolescents aged 12 to 19 years. The sample was drawn from the original cohort recruited for the Health of Young Victorians Study 1997.  State sample (Victoria).	Overall	Overweight% 20.2	Obese% 6.1	O+O% 26.3

	Study	Sample	Findings			
16	<b>The Pacific Obesity Prevention in Communities project 2006</b> 2005 - 2006  Millar, Kremer, de Silva-Sanigorski, McCabe, Mavoa, Moodie, Utter, Bell, Malakellis, Mathews, Roberts, Robertson, Swinburn (2011)	3,040 secondary students aged 12 to 18 years enrolled in regional Victorian schools (baseline data for an intervention project).  State sample (Victoria).	Overall	O+O%	28.9	
17	<b>The National Youth Cultures of Eating Study (NYCES) 2006</b> Aug - Nov 2006  O'Dea (2008a)	7,889 children in grades 3 to 11 aged 6 to 18 years.  National sample.	Boys 6-11y 12-18y  Girls 6-11y 12-18y	Overweight%	Obese%	O+O%
				15.8	6.4	22.2
				17.7	5.6	23.3
				18.8	7.7	26.5
				19.5	5.7	25.2
18	<b>The Australian National Children's Nutrition and Physical Activity Survey 2007</b> Feb - Aug 2007  Commonwealth of Australia (2008)	4,487 children aged 2 to 16 years.  National sample.	Boys 2-3y 4-8y 9-13y 14-16y 2-16y  Girls 2-3y 4-8y 9-13y 14-16y 2-16y  Overall	Overweight%	Obese%	O+O%
				17.0	4.0	21.0
				13.0	5.0	18.0
				18.0	7.0	25.0
				19.0	6.0	25.0
				17.0	5.0	22.0
				14.0	4.0	18.0
				15.0	6.0	21.0
				23.0	7.0	30.0
				16.0	7.0	23.0
				18.0	6.0	24.0
				17.0	6.0	23.0
	<b>The Australian National Children's Nutrition and Physical Activity Survey 2007</b> Feb - Aug 2007  Garnett, Baur, Cowell (2011)	2,585 children aged 7 to 15 years.  National sample.	7 - 15y	Overweight%	Obese%	O+O%
				17.8	7.1	24.9
19	<b>The Longitudinal Study of Australian Children (LSAC) 2008-09</b> 2008  Freeman, Fletcher, Collins, Morgan, Burrows, Callister (2011)	3,285 children aged 8 to 9 years, born between March 1999 and Feb 2000. The sample was drawn from the LSAC cohort.  National sample.	8 - 9y	Overweight%	Obese%	O+O%
				16.9	5.6	22.5
20	<b>Unnamed 2009</b> Aug - Sept 2009  O'Dea, Nguyen Hoang, Dibley (2011)	498 students in grades 4, 5 and 6.  State sample (NSW).	9 - 10y 11 - 12y	Overweight%	Obese%	O+O%
				18.4	12.2	30.6
				18.8	3.0	21.0
21	<b>The NSW Schools Physical Activity and Nutrition Survey (SPANS) 2010</b> Jan 2010-July 2010  Hardy (2011)	8,058 students in grades k, 2, 4, 6, 8 and 10.  State sample (NSW).	Boys Girls Overall	Overweight%	Obese%	O+O%
				17.6	6.4	24.0
				16.5	5.0	21.5
				17.1	5.8	22.8

### *Sampling frames*

Almost all of the studies included in Table A.1 were based on a random sample of children from a state or national population. The exception was the Western Australian Pregnancy Cohort Study (WAPCS) which establish a cohort of mothers and children from one large public hospital.

Most studies with the exception of the NNS, the WAPCS, and the ANCNPAS used cluster sampling methods to recruit participants. Clustered random samples offer a relatively efficient way of achieving a representative sample of participants. Schools are frequently used as the basis for a clustered sampling frame in studies involving children (Farmer et al., 1996), as all children must attend school by law until the age of 15 years. However, clustered sampling methods can result in disproportionate sampling of some groups, depending on the sample source. Furthermore, people who live in the same area tend to have similar characteristics or behaviours, and this can give rise to homogeneity bias in clusters (Steglich and Snijders, 2007; Thomas and Heck, 2001). Steglich and Snijders (2007) suggested people with similar interests or values and behaviours tend to group together and people tend to be influenced by the behaviours of people who live around them. Of particular relevance here, obesity has been shown to cluster in groups (Cutting et al., 1999; Christakis and Fowler, 2007). The latter authors argued that obesity may be “spread through social ties”.

### *Sample size*

The sample sizes of the prevalence studies included in this review ranged from 498 to 13,858 children. An approximate formula for the necessary sample size required to estimate a proportion with a given limit of error  $L$  is  $n = 4p(1-p)/L^2$  where  $p$  is the estimated proportion and  $L$  is the allowable error for the estimation of the proportion with 95% confidence limits (Snedecor and Cochran, 1989). If the underlying prevalence of overweight/obesity in the population ( $p$ ) is conservatively assumed to be 20% and the limit of error  $L$  is taken to be 5%, then a sample size of 256 will be sufficient to estimate the prevalence of overweight/obesity.

### *Sample representativeness*

For inclusion, the study samples had to be representative of either a city, state or national population. While it was argued in each article that the respective sample was representative, it was also acknowledged in many instances that some children were excluded because of the nature of the study design. Children who were excluded were primarily those living in rural or remote areas, children with health issues, or children with learning disabilities. Time or funding limitations, or travel logistics, were cited as reasons for not sampling certain groups of children. Some ethnic groups (Cook, Rutishauser and Seelig, 2001; Booth et al., 1998; Wake et al., 2007; Booth et al., 2006) and some SES groups (Wake et

al., 2007) were also noted to be under-sampled in some studies. Excluding the small proportion of children living in remote areas would likely have minimal effect on overall obesity prevalence estimates. Including the children in more distal areas was unlikely to outweigh the time and expense involved in collecting height and weight data from a wider geographic area.

In the majority of studies it was unclear if non-Caucasian Australians were excluded from the sampling frame. Studies in which participant ethnicity was collected as part of the demographic information included AHFS in 1985, NNS in 1995, CLAN in 2001, CLASS in 2001 and SPANS in 2004/2010. Both the 2000 and the 2006 National Youth Cultures of Eating Studies (NYCES) deliberately sourced children from a range of ethnic/cultural backgrounds (O'Dea, 2008; O'Dea, 2007; O'Dea and Wilson, 2006).

Language difficulties may result in some ethnic groups being under-represented in prevalence studies. For example, students participating in the SPANS study were asked to report their ATSI status and the "language spoken most at home" which was used to categorise the cultural backgrounds of students. Students living in English speaking households or from Asian cultural backgrounds were over represented (Booth et al., 2006), while students who spoke a language other than English (primarily European or middle-Eastern cultural backgrounds) were under represented in SPANS.

#### *Form of parental consent*

Participant consent can be collected via passive or active consent. Passive consent means that researchers can include any children in the study sample after providing information, if their caregiver has not explicitly requested that their child be excluded (de Meyrick, 2005). To obtain active consent researchers must obtain written informed consent from children's parents or guardians before researchers are able to invite children to participate in a study.

Passive consent puts the onus on children's parents or guardians to notify the investigators if they do not want their children to take part in research; traditionally, this form of consent results in higher study participation. In the case of child anthropometric measuring to monitor the prevalence of childhood obesity, the Australian National Health and Medical Research Council (NHMRC) recommends adopting passive consent as an efficient method to improve participation.

However passive consent methods have been criticised for failing to recognise that information packs may not ever reach parents, and assumes a level of literacy that parents may not have. Parents may not fully understand the researcher's request and may not seek clarification. However, passive consent is still permitted in Australia and may be preferred by school principals and researchers (Ciarrochi et al., 2008; Macquarie University, 2008).

Provided that participants are supported to make informed individual decision making, passive consent methods, wherein parents are given the opportunity to withdraw their children and children can refuse to be measured on the day, are ethical and do not compromise individuals' rights (Stubbs et al., 2009).

Active consent relies on parents signing and returning a consent form, and thus obtaining this form of consent is more time consuming for investigators. In clustered samples drawn from schools, significant co-operation from the school in terms of administrative help and support is also needed (Esbensen et al., 1996). Study response proportions using an active method of consent are generally lower than in studies where passive consent methods are used (de Meyrick, 2005; Pokorny et al., 2001).

All of the reviewed studies which indicated a method of consent reported using active consent. In five studies the form of consent obtained was not clearly stated.

#### *Study response proportion*

Last (1995) defines a "response rate" as the actual number of respondents divided by the potential number of respondents. Since the term rate implies time is involved in the denominator, in this thesis the term "response proportion" is used in preference to "response rate".

Response proportions are often viewed as an indicator of the adequacy of an epidemiological study. However, if a low response proportion is observed, but the respondents are representative of the population, then there is no introduced bias in the measures of effect. Conversely, a high response proportion may be associated with a biased measure if there was differential non-response between subgroups in the population.

Non-response is particularly important issue for studies concerned with obesity, because heavier people may be less likely to participate (Wang et al., 2002; Lazarus et al., 2000). Fifteen of the reviewed studies reported individual or school-level response proportions. These ranged from 27% of 5-6 year old students approached in the CLAN study to 91% of year 6 students approached in the NSW SFPAS. Most studies reported high participation at a school level, for example, both the 1985 AHFS and the 1997 NSW SFPAS reported over 90% of schools approached agreed to participate.

Response proportions across studies, although the reasons for this are not entirely clear. Heavily funded government studies, such as the Australian Health and Fitness Survey (AHFS) had high participation (78%), but other national, government funded studies such as the NNS and the LSAC had lower response proportions (61% and 59% respectively). Studies that used school-based samples had similar response proportions to studies that used alternative sampling frames. The CLAN study had the lowest study

response proportion, recruiting only 27% of 5-6 year old students approached. In this study, the low response proportion was attributed to the requirement of signed parental consent for participation.

The ANINS study, the sole reviewed study that did not have an explicit focus on overweight/obesity, required a great deal of involvement from participants. This included the provision of a fasting urine sample and undergoing a thyroid ultrasound. The ANINS response proportion of 66% may reflect the unpalatability of these requirements to the sample list. For the SPANS study (Booth et al., 2004), students in grades 2 through 10 were recruited. All children were asked to complete questionnaires and participate in simple anthropometric measurements. Students in grades 8 and 10 in this study were also asked to have additional body measurements, participate in a range of physical endurance tasks, and take part in a blood test. Thus, while participation among the younger years (grades 2-6) was high, response proportions for grades 8 and 10 were as low as 50%. This was partly attributed to the blood collection aspect of the study (Booth et al., 2006).

#### *Focus of the studies*

Some studies collected physical data apart from height and weight, such as physical endurance, skill measures, or blood tests. The response proportion may be lower in such studies because of the additional respondent burden that participants faced.

For the NSW Schools Physical Activity and Nutrition Survey (SPANS) carried out in 2004 and 2010, students in grades 2 through 6, 8 and 10 were recruited. All children were asked to complete questionnaires and have simple anthropometric measurements made. Students in grades 8 and 10 were also asked to submit to additional body measurements, participate in a range of physical activity endurance and skill measures, and participate in a blood test (Booth et al., 2004, Hardy 2011). The blood collection component of the study appears to have led to a lower response proportion of students in the higher grades compared to those in grades 6 and below.

Only one reviewed study collected child weight and height data for purposes other than to determine the prevalence of childhood obesity: the Australian National Iodine Nutrition Study (ANINS), conducted in 2003, primarily sought to measure children's iodine levels.

Overt attention to child weight may lead to differential non-response, particularly among children who are heavier (Dollman and Pilgrim, 2007). An example where this was taken into account in study design may be found in the Longitudinal Study of Australian Children (LSAC). In this study, weight-related questions were embedded within a larger questionnaire that covered a range of health and social domains. The purpose of embedding weight-related questions in this way was to reduce the emphasis on childhood obesity (Wake et al., 2002; Wake et al., 2008).

## Appendix B: A table of quantitative papers investigating factors that contribute to childhood overweight/obesity in Australia

**Table B.1: Quantitative papers investigating factors that contribute to child overweight/obesity in Australia, published 2001-2006**

Authors, year of publication	Study design, sample, age of children	Main findings	Socio-economic status considered
<i>Genetics, intrauterine environment and early life factors</i>			
Oddy, Sherriff, de Klerk, Kendall, Sly, Beilin, Blake, Landau, Stanley (2004)	Cross-sectional, n=2195 children, 6 years	Duration of breast feeding was not associated with child BMI. Boys with asthma were more likely to be overweight than those without asthma.	No
Burke, Beilin, Simmer, Oddy, Blake, Doherty, Kendall, Newnham, Landau, Stanley (2005a)	Longitudinal, n=2,087 children, 8 years	Breast feeding for less than 4 months was associated with greater mean weight for length in children at age 1 year. Breast feeding duration was associated with child BMI status at 8 years: children breast fed $\geq 12$ months were leaner than those breast fed $\leq 4$ months.	As a covariate
Mamun, Lawlor, O'Callaghan, Williams, Najman (2005a)	Longitudinal, n=2,934 children, measured at 5 and 14 years	Maternal and paternal overweight/obesity associated with child overweight/obesity at 5 and 14 years.	As a covariate
Lawlor, Davey Smith, O'Callaghan, Alati, Mamun, Williams, Najman (2006)	Longitudinal, n= 3,340 children, 14 years	Higher pre-pregnancy weight of mother associated with heavier birth weight and heavier child at 5 and 14 years. Father's BMI was not associated with infant birth weight or child BMI.	As a covariate
Mamun, Lawlor, Alati, O'Callaghan, Williams, Najman (2006)	Longitudinal, n= 3,253 children, 14 years	Maternal smoking during pregnancy associated with increased BMI of child in adolescence.	As a covariate
Shields, O'Callaghan, Williams, Najman, Bor (2006)	Longitudinal, n=3,698 children, 14 years	Breast feeding for a period greater than 6 months was associated with decreased risk of obesity (but not overweight) in adolescence (not statistically significant).	As a covariate
<i>Psychological factors</i>			
Hesketh, Wake, Waters (2004)	Longitudinal, n=1,157 children, 5-10 years	Low self-esteem in children at 7 years associated with overweight/obesity at 10 years of age.	No
Hanna and Bond (2006)	Cross-sectional, n=196 girls, 14-18 years	Current BMI is not associated with family conflict.	No

<b>Authors, year of publication</b>	<b>Study design, sample, age of children</b>	<b>Main findings</b>	<b>Socio-economic status considered</b>
<i>Psychological factors (cont.)</i>			
O'Dea (2006)	Cross-sectional, n=80 girls, 11-13 years	Adolescent overweight and obesity is associated with poor self-image, lower quality friendships and perception of poor social acceptance.	No
<i>Child diet</i>			
Magarey, Daniels, Boulton, Cockington (2001)	Longitudinal, n=243 children, followed up from 2 to 15 years	Fat intake was directly, and carbohydrate inversely, associated with child subscapular skin fold thickness. Fat intake at 6 years was positively associated child BMI at 8 years. Protein intake negatively associated with BMI at 8 years.	No
Wang, Patterson, Hills (2003)	Cross-sectional, n=1,581 children, 7-15 years	Fat and overall energy intake was not associated with child BMI categories for adolescents	No
Bell, Kremer, Magarey, Swinburn (2005)	Cross-sectional, n=3,007 children, 2-18 years	Young child (2-4 years) overweight/obesity is associated with intake of non-core beverages (but not intake of non-core foods). For children aged 2-7 years, overweight and obesity was associated with higher overall energy intake. For children aged 8-10 years, there was no difference in reported energy intake across BMI categories. For adolescents aged 11-17 years, energy intake was lower amongst overweight and obese than among those with normal weight.	No
Finch, Sutherland, Harrison, Collins (2006)	Cross-sectional, n=5,206 children, 6-13 years	Canteen use/purchases or amount of money spent was not associated with child BMI.	Explanation of gradient attempted
Mamun, Lawlor, O'Callaghan, Williams, Najman (2005b)	Cross-sectional, n=3,795 children, 14 years	Ambivalent maternal attitude towards family eating together associated with adolescent overweight status.	Explanation of gradient attempted
O'Dea, Wilson (2006)	Cross-sectional, n=4,441 children, 6-18 years	Higher dietary self-efficacy and better nutritional quality breakfasts associated with lower BMI. High food variety associated with higher BMI. Nutrition knowledge and dietary locus of control not associated with BMI. Low SES was associated with higher BMI.	Explanation of gradient attempted
Swinburn, Jolley, Kremer, Salbe, Ravussin (2006)	Cross-sectional, n=963 children, 4-18 years	High energy intake more strongly associated with high body weight than low energy expenditure.	No
Tam, Garnett, Cowell, Campbell, Cabrera, Baur (2006)	Longitudinal, n=268 children, 6-8 years at baseline, 12-13 years at follow up	Children who consumed more soft drink and/or cordial were more likely to become overweight or obese. Fruit juice and milk intake not associated with BMI status.	No

<b>Authors, year of publication</b>	<b>Study design, sample, age of children</b>	<b>Main findings</b>	<b>Socio-economic status considered</b>
<i>Screen time/viewing</i>			
Wake, Hesketh, Waters (2003)	Cross-sectional, n=2,862 children, 5-13 years	Child BMI positively associated with time spent watching TV, but not with computer or video game use. TV viewing time not significantly associated with child BMI after adjustment for parental BMI, child diet and activity level, and family demographics.	Documented gradient
Salmon, Timperio, Cleland, Venn (2005)	Cross-sectional; n=557 children, 9-13 years in 1985; n=926 children, 9-13 years in 2001	Participation in active school transport and physical education declined between 1985 and 2001, while prevalence of overweight and obesity increased.	Explanation of gradient attempted
Hardy, Dobbins, Denney-Wilson, Okely, Booth (2006)	Cross-sectional, n=2,750, primary and secondary students	More hours spent engaged in small screen recreation associated with overweight and obesity among primary school girls.	As a covariate
Salmon, Campbell, Crawford (2006)	Cross-sectional, n=1,560 children, 5-6 and 10-12 years	Children who watched more than 2 hours of TV per day more likely to engage in behaviours associated with obesity – snacking on unhealthy foods/drinks and limited physical activity.	As a covariate
Spinks, Macpherson, Bain, McClure (2006)	Cross-sectional, n=518 children, 5-12 years	Children who did not comply with the 2004 Australian recommended guidelines for physical activity and electronic media usage were more likely to be overweight than others.	Explanation of gradient attempted
<i>Physical activity</i>			
Vincent, Pangrazi, Raustorp, Tomson, Cuddihy (2003)	Cross-sectional, n=563 children, 6-12 years	More active children had lower BMIs than less active children.	No
Abbott, Davies (2004)	Cross-sectional, n=47 children, 5-10 years	Children with the most vigorous physical activity levels had over body fat measures.	No
Franklin, Denyer, Steinbeck, Caterson, Hill (2006)	Cross-sectional, n=2,813 children, 9-13 years	Obesity in adolescence associated with lower perceived athletic competence, physical appearance, and self-worth.	SES data collected by not used
Hardy, Dobbins, Booth, Denney-Wilson, Okely (2006)	Cross-sectional, n=2,750 children, 11-15 years	BMI associated with hours engaged in sedentary behaviours for some age groups.	Explanation of gradient attempted

Authors, year of publication	Study design, sample, age of children	Main findings	Socio-economic status considered
<i>Combined proximal factors – diet, physical activity and screen time</i>			
Ball, O'Connor, Abbott, Steinbeck, Davies, Wishart, Gaskin, Baur (2001)	Cross-sectional, n=106 children, 6-8 years	In boys, physical activity inversely associated with BMI, fat mass and percentage of body fat. No association for girls.	No
Burke, Beilin, Dunbar (2001)	Longitudinal, n=219 children, measured at 9, 12, 15 and 18 years	Physical fitness negatively associated with BMI in 18 year olds. High parental BMI predicted high child BMI. Birth weight unrelated to BMI in 18 year olds.	Documented gradient
Bogaert, Steinbeck, Baur, Brock, Bermingham (2003)	Longitudinal, n=41 children, 6-10 years	Diet and energy expenditure over a one year period not associated with child BMI change over the same period. Elevated LDL cholesterol was predictive of weight gain over one year.	No
Burke, Beilin, Simmer, Oddy, Blake, Doherty, Kendall, Newnham, Landau, Stanley (2005b)	Longitudinal, n=1430 children, measured at 1, 3, 5 and 8 years	BMI at age 8 was positively predicted by birth weight, hours spent watching TV as measured at 6 years and negatively predicted by maternal non-smoking, child consumption of cereals and bread, and physical activity. Child overweight/obesity was associated with parent overweight/obesity. At 6 and 8 years of age, child BMI was higher among low income families and lower in families where the mother had tertiary level education.	Documented gradient, SES included in models as a covariate
Garnett, Cowell, Baur, Shrewsbury, Chan, Crawford, Salmon, Campbell, Boulton (2005)	Longitudinal, n=342 children, measured at age 7-8 and 12-13 years	Child overweight/obesity associated with maternal overweight or obesity, low levels of vigorous physical activity, greater time spent watching TV, advanced pubertal status (for girls) and lower levels of energy intake. Pubertal status in boys, paternal adiposity, micro-nutrient intake and family SES were not associated with child overweight/obesity.	As a covariate
Burke, Beilin, Durkin, Stritzke, Houghton, Cameron (2006)	Cross-sectional, n=602 children, mean age 12 years	High fitness level negatively associated with overweight/obesity in boys. Positive association with TV time for boys, negative association in girls. Computer use not associated with overweight/obesity.	As a covariate
Campbell, Crawford, Ball (2006)	Cross-sectional, n=560 children, 5-6 years	Increased TV viewing time and parent's perception that the diet of their children was adequate associated with increased energy intake and consumption of snacks.	As a covariate

<b>Authors, year of publication</b>	<b>Study design, sample, age of children</b>	<b>Main findings</b>	<b>Socio-economic status considered</b>
<i>Environment</i>			
Timperio, Salmon, Telford, Crawford (2005)	Cross-sectional, n=1,210 children, 5-6 and 10-12 years	Parental perception that traffic in the local area was heavy and parental concern about road safety associated with child overweight/obesity.	As a covariate
<i>Socio-economic status</i>			
Wang, Patterson, Hills (2002)	Cross-sectional, n=1,581 children, 7-15 years	Boys from households with the highest incomes less likely to be overweight/obese than boys from households with lowest incomes. Parental overweight/obesity associated with child overweight/obesity.	Documented gradient
O'Dea (2003)	Cross-sectional, n=4,441 children, 6-13 years	Children of low SES more likely to be overweight/obese than children of mid/high SES.	Documented gradient
Dollman, Pilgrim (2005)	Cross-sectional; n=1,423 children, 10-11 years in 1997; n=992 children, 10-11 years in 2002	Living in urban areas associated with increased sum of skin folds, waist girth and BMI amongst girls. Low or medium SES associated with higher sum of skin folds amongst girls.	Documented gradient
Wake, Hardy, Canterford, Sawyer, Carlin (2007) (online 2006)	Cross-sectional, n=4,983 children, 4-5 years	Economic disadvantage and low maternal education associated with increased risk of child overweight/obesity.	Explanation of gradient attempted

## Appendix C: A review of qualitative studies theorising about the social determinants of childhood overweight/obesity

Table C.1: Seven studies theorising about the social determinants of child overweight/obesity

Authors, publication year, title, country	Study focus	Study sample	Study methods
Dobson, Beardsworth, Keil, Walker (1994) <i>Diet, choice and poverty: Social, cultural and nutritional aspects of food consumption among low-income families.</i> UK	The food purchasing and consumption patterns in very low income families, what participants ate, and factors that constrain and shape food choice was the primary focus. In particular, households that had recently undergone financial upheavals were investigated in order to understand how households adapted to very low or decreased incomes.	The sample comprised 48 households located in two areas in a midland city in the UK. All of the families in the study received financial support from the government or were classed as low income. All the families included children. Half of the families were headed by a single mother.	The investigators conducted semi-structured personal interviews with each adult family member (48 mothers, 16 fathers) and any children older than 7 years. Combined interviews with the entire family present were conducted for families with older children (n=18). Expenditure diaries and consumption diaries were collected for all 48 families. For 18 families, a follow-up interview was conducted 6 months later.
Grieshaber (1997) <i>Mealtime rituals: power and resistance in the construction of mealtime rules.</i> Australia	The way child resistance is expressed on an everyday basis, using the example of mealtime rules to exemplify the strategies of children resistance, parent-child conflicts, and the ways in which family interactions are regulated by adult-generated rules was the primary focus.	The sample consisted of four Australian families. Each family had two parents and at least one child aged 6 years, living in an Australian capital city. The families came from different SES levels (1 low, 2 mid and 1 high SES) and each had one parent at home full-time.	Un-structured, in-depth interviews in the homes of the families and a minimum of 30 hours of ethnographic fieldwork were undertaken with each family.  Possible limitation: -Sample size was very small (n=4), even for a qualitative study.
Hitchman, Christie, Harrison, Lang (2002) <i>Inconvenience food: The struggle to eat well on a low income.</i> UK	The food poverty situation in inner London and the rural shires, environmental and financial factors which constrain food purchasing and preparation, and how food poverty has impacted on the lives of families over time was the primary focus.	There were 105 participants in the sample. Of these, 52 were from households with no employed persons, 30 had one employed person and 12 households had two employed adults. Most of the study participants received state benefits (unemployed, disability, old age, and parenting) and the remainder worked in low paid jobs.	The investigators conducted semi-structured interviews with the family member primarily responsible for food purchases. In addition, group interviews, ethnographic fieldwork, time-use diaries were used to collect data.  Possible limitation: -People in extreme financial situations were deliberately sourced. All study participants were recipients of government payments at the time of the study.

Authors, publication year, title, country	Study focus	Study sample	Study methods
Pugh (2002) <i>From compensation to childhood-wonder: Why parents buy.</i> USA	Factors influencing parents' purchasing decisions, including the consumption of consumer products on behalf of children as a means of practicing 'good' parenting was the primary focus. The use of consumption to project certain family lifestyles, to compensate children for parents being at work, and to participate in consumer culture were an additional focus. The impact of changing power dynamics between parents and children on consumption practices were also considered.	The study sample included 7 white, middle class mothers. Of these, 4 mothers were married and 3 were divorced. In five of the families there were 2 children and the other 2 families had an undisclosed number of children. Mix of mothers who were home full-time, worked part-time, worked full-time.	Investigators conducted in-depth interviews with the mothers. In addition, other field work included the interviewer participating in a child-related shopping trip with the mother.  Possible limitation: -Very small study sample (n=7), even for qualitative work.
Dixon J, Banwell C (2004). <i>Heading the table: parenting and the junior consumer.</i> Australia	The power balance between parents and children regarding what foods are offered and eaten within the family environment was the primary focus. Why parents acquiesce to their children's demands for particular foods despite parents' reported knowledge of nutritious diets was also a focus.	The sample comprised 33 men and women, 31 of whom had families with children. Individuals formed focus groups based SES. Two of the groups were of low SES, and one group was of lower middle class SES. Low SES parents were recruited from a weekly parenting support group, while middle SES parents were recruited from a place of employment.	The investigators used focus groups comprised of parents of similar socio-economic status.
Coveney (2000) <i>Food, morals and meaning: The pleasure and anxiety of eating.</i> Australia	Family eating habits, specifically the food purchasing and preparation arrangements, the composition of meals and the position of children in family decision-making regarding food was the primary focus of the study.	The sample comprised of 12 two-parent families living in two different suburbs of Adelaide, 6 from a high SES suburb and 6 from a low SES suburb. All families had at least one child aged between 5-12 years, in order to reflect an 'average Australian family'.	Investigators conducted in-depth interviews with parents (both parents interviewed together) in the home of participants families.
Noble (2007) <i>The paradoxical food buying behaviour of parents: Insights from the UK and Australia,</i> Australia and the UK	For the Australian study the focus was the motivations of parents of pre-school children in purchasing both healthy and unhealthy food in the supermarket and the contrast between parents' nutritional knowledge and their actual food purchasing and eating practices.  For the UK study, the focus was parenting attitudes and behaviours relating to children eating vegetables.	The Australian sample included 116 parents recruited from seven childcare centres in a regional NSW city. All parents had at least one child under the age of 6 years. Approximately 90% of the parents in the sample were mothers and 80% of the parents had received post-secondary education (80%).  The UK sample consisted of three focus groups of 6-8 parents of children aged 3 to 5 years of age.	"Projective techniques", including both picture response and story response techniques were used in data collection for the Australian study.  A possible limitation of the study methods was that analyses which considered the effect of SES were not undertaken.  For the UK study, the investigators used focus groups, each lasting one to one-and-a-half hours.

## Appendix D: A map of arguments concerning social determinants of childhood overweight/obesity

Table D.1: Map of arguments concerning social determinants of child overweight/obesity

Proposed underlying pathway to childhood obesity		Implication for low SES parents and obesity in children
<i>Financial pressure</i>		
1	Some parents do not have the financial means to afford healthy foods. Some healthy foods are relatively expensive and other healthy foods are perceived to be, although they may not be.	Low income families must adhere to tight food budgets and so buy inexpensive processed foods, processed meats, and cheap pre-prepared meals rather than more expensive but healthier options.
2	Some parents are not in a financial position to offer children food that might be refused and wasted.	<p>Parents with low incomes will only offer their children palatable foods that are likely to be accepted by children (and partners). The foods children are likely to find palatable are energy dense foods, high in fat, sugar or carbohydrates.</p> <p>Low income parents allow their children to determine what foods are purchased in the supermarket (not just what foods they will or will not eat after the meal is served) so that money is not spent on food that would not be accepted by children.</p> <p>It is most likely that low income families cannot practice the healthier and more effective child feeding strategies suggested by experts as this would involve an unacceptable degree of trial and error and food wastage.</p>
3	Avoiding food spoilage is important for parents with low income, as it would waste food and money.	Low income parents are more likely to buy foods that have long shelf lives, such as processed foods, non-perishables and frozen foods. Processed foods are often higher in fat, salt, sugar and carbohydrates than fresh foods.
4	Low income parents need to maintain strict food budgets and also minimise the money they spend on food in times when money is short, while still preventing children from feeling hungry. The quality of diets in low income families can therefore vary considerably over quite short periods of time, depending on the weekly/fortnightly financial situation and expenses of the family. Usually, fresh fruits and vegetables are the first to be cut from diets when money runs low.	<p>Low income parents purchase foods that represent value for money. This means 'cheap and filling' foods such as processed meats, hot chips and potatoes.</p> <p>Low income parents minimise the temptation to overspend on food by shopping in discount food stores where there is a limited range of purchase options, predominantly cheaply priced processed foods with long shelf lives.</p> <p>Low income parents need to shop in ways that will help them minimise their food budgets. Some parents shop frequently, even daily, in order to preserve money in case of an emergency when the budget is tight. This may mean that children are exposed to supermarket marketing more often, and have greater opportunity to pester parents for foods. Other low income parents opt to shop very infrequently, sometimes only once a month, in order to minimise temptation to buy items that are not needed. This is likely to reduce the amount of fresh fruits and vegetables eaten by the family and predicate diets reliant on processed foods.</p>
5	Low income parents want to protect their children from the worst effects of poverty and so may spend a disproportionately high amount of uncommitted money on their children (or transfer relatively large amounts of disposable income to their children).	Children in low SES families may have more freedom and ability to buy marketed foods. Children in the under-teens age group are targeted in marketing for foods that are unhealthy snack or fast foods.
6	Low income parents often have limited access to supermarkets that stock a wide variety of healthy food for reasonable prices, either because of where they live, or lack of access to transport.	In some situations, parents would have to devote large blocks of time (and money) in order to shop healthily and cost effectively (shop around for the best prices). For parents who do not have access to private transport, shopping is particularly time consuming and entails additional expenses.

Proposed underlying pathway to childhood obesity		Implication for low SES parents and obesity in children
<i>Time pressure</i>		
7	Parents are under time pressure for a variety of reasons, such as employment, domestic responsibilities, transportation issues, lack of social supports and blurring of boundaries between work and home life.	Low income parents have time pressures but not the economic means to purchase goods and services to relieve it. As a result mothers may cut corners with cooking and meal preparation, such as by buying food that will keep for long periods of time or buying convenience or processed foods requiring minimal preparation.
8	Time pressured parents have a greater need for efficiency in the everyday running of households and use bribes or authoritarian parenting methods.	Low income parents use food bribes because it is what they can afford. Authoritarian parenting strategies are associated with parental over control of child eating.
9	Parents need meals to be dealt with quickly and efficiently in order to move on to other domestic tasks.	Low income parents, who often eat meals with children, allow children to dictate the family meal menu in order to avoid conflicts that drag meals out.
10	Working parents are more permissive with children because they want the limited time they have with children to be pleasant.	Parents therefore bribe children to behave with treats/rewards. Low income parents who do not have the money to bribe children with non-food items resort to bribing their children with food treats.
<i>Parenting practices</i>		
11	'Good parents' give their children rights and allow children some say/influence in family decisions, although this needs to be negotiated. Low income parents may have more permissive parenting styles and allow greater levels of child autonomy. Food is specifically mentioned as an area of increased child autonomy.	Low income parents may be more inclined to allow their children to determine their own diets (at the shops, through to during meals). However, low income parents do not necessarily partake in the negotiation that must occur along with this to encourage children to have healthy diets.
12	Parents want their children to 'fit in' and 'feel normal'.	Food is one realm in which low SES parents can achieve this, through the purchase of branded or marketed foods.
13	Like all parents, low income parents engage in sacrifice as an aspect of good parenting, where children often come first in terms of allocating money.	Low income parents will opt to put the little money they have into buying snack foods and treats for children as it is affordable. In addition, low income parents who skip meals or snack themselves may model unhealthy dietary practices to their children.
14	Parents wish to avoid conflict with their children because good parents make their children happy by meeting the needs and desires of their children.	Low income parents may not have the means to meet all of their children's requests, but can oblige their children's food requests and so parents are more lenient/permissive regarding child diet.
15	Parents may give their children desired foods because they believe it will make their children love them more.	Parents wish to indulge their children with consumer goods in order to strengthen parent-child bonds but low income parents do not have the money to provide their children with non-food treats.
16	Parents are uncomfortable with allowing their children to miss even one meal because good parents don't let their children go hungry. If children refuse to eat a meal, parents feel compelled to offer an alternative meal (usually less healthy).	To avoid children going hungry and having to provide replacement meals, low income parents opt to provide children with palatable, unhealthy foods that children are likely to accept the first time around. Low income parents may be more inclined to believe that children are unable to accurately determine satiety. Parents may pressure children to eat more than they would otherwise, in order to ensure children don't feel hungry.
17	Parents value the social interaction aspect of meals as an opportunity to keep in touch with (or interrogate) children and to reaffirm family connections.	Low income parents are likely to serve meals that will avoid conflict and allow for harmonious meal times.

Proposed underlying pathway to childhood obesity		Implication for low SES parents and obesity in children
<i>Parenting practices (cont.)</i>		
18	All parents find it difficult to consistently enforce food rules. Consistent enforcement of rules takes considerable parental energy, which some parents cannot maintain (single/working/low income parents).	If food rules are not enforced consistently children become confused about the purpose of the rules and will learn that parents will allow children to break the rules in certain circumstances. In low income families food rules are adapted and enforced depending on the family's day-to-day situation so there may be limited rule consistency.
19	Parents believe children need rewards, either to encourage good behaviour, or because children deserve treats simply for being children.	Low income parents use food as rewards frequently because food treats are affordable.
20	Parents maintain the belief that 'good' parents have well behaved children. Parents need to feel that they are in control of their children, especially while in public places.	Low income parents are more likely to bribe children with affordable food treats to manage behaviour. Low income parents may be in greater need of a feeling of control over children because they are likely to be experiencing other uncontrollable stressors.
21	Parents need to demonstrate to others that they are 'good' parents by providing their children with the latest consumer goods, in order to demonstrate how much they love and can provide for children.	The marketed goods that low income parents can afford to demonstrate love and their ability to provide for their children are likely to be unhealthy snack foods.
22	Encouraging children to eat healthy foods (e.g. vegetables) requires persisting with assorted strategies, premised on a belief that it is possible to encourage healthy eating and that repeated strategies will eventually be successful.	Low income parents are more inclined to believe that they cannot effectively change the diets of their children and that they cannot force children to eat disliked foods, possibly because low income parents have lower levels of self-efficacy or lack negotiation skills.
23	Many parents believe that child feeding strategies are either ineffective at inducing children to eat healthily, or use objectionable methods, or are impractical. Parents are reduced to offering children old favourites that children will reliably eat or offering bribes.	Low income parents feel they have limited strategies to get their children to eat healthy foods they dislike. Strategies mentioned by parents included bribes, bargaining, spoon feeding, physical punishment, keeping children at the table until they eat, reserving rejected foods for subsequent meals. Some strategies are (understandably) unacceptable to parents. Others are seen as expensive to implement, wasteful, time consuming or requiring infinite patience and parent-child negotiation skills.
<i>Gender roles</i>		
24	Women, especially those in low income families, are constrained by persisting gendered stereotypes.	The gendered stereotypes of women (and mothers) have many implications, but in particular, women are given the responsibility of food provision and disciplining in relation to food in families. Women also receive little to no support (or relief) from men for these tasks. Adherence to strong gendered stereotypes may be more common in low income households.
25	Even in families that depart from the 'male breadwinner' stereotype, women are still the primary caregiver for children and retain most of the responsibility for childcare and food provision.	Working women do a 'second shift'. Tiredness, stress and time pressure may therefore result in mothers cutting corners in order to minimise the time spent preparing meals.
26	Women are expected to cater to the preferences of others when making family meal decisions. In previous generations, family meals were often dictated by the preferences of husbands, however, contemporary mothers are guided by the food preferences of children.	Mothers are expected to serve their children foods that children prefer in order to fulfil their caring role. The foods children are likely to prefer are energy dense, high fat and high sugar foods. Low SES women are more likely to feel obliged to meet this expectation (and may have less power to make changes in a household).

Proposed underlying pathway to childhood obesity		Implication for low SES parents and obesity in children
<i>Compensation</i>		
27	Low income parents want to compensate their children for the family's poverty.	Low income parents are likely to opt for an obvious and affordable way to treat children, by providing them with special foods.
28	Working parents want to compensate their children for the lack of time parents spend with them.	
29	Parents want to compensate for other perceived wrongs in their children's lives. Parents attempt to compensate their children for specific circumstances including: negative emotions (e.g. child depression), parental divorce and child illness.	
<i>Priorities</i>		
30	When there is a limited budget for food, a number of considerations determine what is purchased, for example: cost, taste, cultural acceptability, status, perceived value for money and perceived quality.	Low income parents buy low cost and tasty foods before they put money into buying foods which are healthy but expensive or poor value for money, or foods that are of low status.
31	Family mealtimes are social occasions and important opportunities for parents to teach or model appropriate social behaviours (socialisation) in several domains. Correct table manners and eating slowly and politely is one domain which may be valued by parents above getting their children to eat nutritious meals.	Parents may serve their children palatable foods so that their children will eat and practice acceptable eating behaviours, allowing parents to get through dinner with minimal fuss and mess. This may be because the negative effects of poor diet are far off, whereas the mess and distress children can create while eating is experienced immediately.
32	Family mealtimes are social occasions and important opportunities for parents to teach or model appropriate social behaviours (socialisation) in several domains. Happy social interaction between family members and how to converse with parents is another domain. Parents consider showing appropriate interest in children at mealtimes to be good parenting. Teaching children to participate in social discourse is prioritised over getting children to eat healthily.	Parents may serve their children palatable foods so that their children will eat happily and communicate nicely with parents. Child conflict over establishing healthy eating patterns is not trivial for any parent, but for low income families, who have many other issues to deal with, child conflict may be disproportionately hard to manage and low SES parents may therefore be more likely to acquiesce with children's food requests to prevent/end conflicts.
33	Parents don't want to replicate negative parenting practices. For parents who themselves experienced the distress of force-feeding, not insisting on disliked foods being eaten by children is more important than ensuring that children eat nutritious diets. This is partly due to the decreased social acceptability of authoritarian parenting and to contemporary ideas that ethical parents preserve the individual autonomy of children.	Low income parents are more likely to have experienced force feeding in their childhoods as poverty meant their parents had fewer food choices to offer and were more likely to practice authoritarian parenting methods. They are reluctant to impose any foods on their children, even by less harsh means (and they have little experience of how this could be achieved).

Proposed underlying pathway to childhood obesity		Implication for low SES parents and obesity in children
<i>Priorities (cont.)</i>		
34.	Food is equated with love and caring, and parents wish to avoid the distress of children rejecting a meal and therefore rejecting their love and authority.	Low income parents may be in particular need to feel as if they are doing a good job as a parent and provide their children with meals they will accept in preference to struggling to get them to eat healthy options.
<i>Marketing and consumption</i>		
35.	Parents are operating within a capitalist society. Consumption on behalf of children is explicitly linked to emotional meanings and is considered to be part of building inter-family relationships and child development.	Low income parents provide their children with food because it is an affordable mode of consumption.
36.	Parents associate marketed branded food items with quality and therefore better value for money.	Low income parents may focus their food budget on buying marketed processed foods, rather than non-marketed fruit and vegetables.
37.	Children want to eat marketed branded foods that they are familiar with or that their peers are likely to eat or recognise.	Low income parents buy their children branded foods because it is an affordable way to help their children hide their poverty, maintain their dignity and avoid social exclusion.
38.	Some parents and children want the television on during mealtimes. This is very likely to expose them to marketing of foods.	Television during meal times exposes families to a greater number of marketing messages, distracts family members from each other and from what they are eating and minimises the cultural transmission of healthy eating behaviours from parents to children. TV viewing may be used as a method for avoiding conflict over meals, or alternatively, lead parents to provide desired meals to avoid conflict during mealtime TV viewing.
39.	Advertisements pressure parents to allow their children greater food autonomy, and encourage children to request it.	Advertisements present a misleading and rosy interpretation of authoritative parenting which encourages child autonomy untempered by negotiation. As a result, low income parents without the skills to negotiate with children effectively, parent permissively rather than authoritatively (i.e. child autonomy without barriers).
40.	Food advertisers target children, shaping their eating preferences. Children in turn use "pester power" to impact on the purchase decisions of parents.	The products marketed towards children are predominantly unhealthy. Low income parents may have less resilience to deny children's requests.
41.	Children learn about food and nutrition from television and receive both healthy and unhealthy messages. Mothers must compete with unhealthy advertising when attempting to develop children's nutritional values.	Low income parents may be less able to consistently enforce healthy food values. In addition, children from low income families may be more heavily influenced by marketing because of their greater exposure to the food values endorsed on TV, compared to children from more affluent households, for a range of reasons.
42.	Food is marketed to parents as a means of deferring conflict with children and transforming mealtimes into happy occasions.	Low income mothers may be more vulnerable to this marketing technique because of a greater need to avoid mealtime conflicts and to perceive themselves as competent parents who make their children happy.

## **Appendix E: Publications arising from this thesis**

Champion, S., L. C. Giles, and V. M. Moore (2010). "Parenting beliefs and practices contributing to overweight and obesity in children." *Australasian Epidemiologist* 17(1): 21.

Champion, S. L., A. R. Rumbold, E. J. Steele, L. C. Giles, M. J. Davies and V. M. Moore (2012). "Parental work schedules and child overweight and obesity." *International Journal of Obesity* 36(4):573-580.

Champion, S., Giles, L.C. & Moore, V.M. (2010) Parenting beliefs and practices contributing to overweight and obesity in children.  
*Australasian Epidemiologist*, v. 17(1), pp. 21-25

NOTE:

This publication is included after page 148 in the print copy of the thesis held in the University of Adelaide Library.

Champion, S.L., Rumbold, A.R., Steele, E.J., Giles, L.C., Davies, M.J. & Moore, V.M. (2012) Parental work schedules and child overweight and obesity.  
*International Journal of Obesity*, v. 36(4), pp. 573-580

NOTE:

This publication is included after page 148 in the print copy of the thesis held in the University of Adelaide Library.

It is also available online to authorised users at:

<http://dx.doi.org/10.1038/ijo.2011.252>

## Reference list

- Adler, N. E. and J. Stewart (2010). "Health disparities across the lifespan: meaning, methods, and mechanisms." *Annals of The New York Academy of Sciences* 1186: 5-23.
- Aeberli, I., R. S. Ammann, M. Knabenhans, L. Molinari and M. B. Zimmermann. (2009) "Decrease in the prevalence of paediatric adiposity in Switzerland from 2002 to 2007." *Public health nutrition* 13(6):806.
- Adam, B. and E. Rieger (2012). *How Self-perception, emotion and beliefs influence eating and weight-related behaviour. A Modern Epidemic: Expert Perspectives on Obesity and Diabetes*. L. Baur, S. M. Twigg, R. S. Magnusson. Sydney, Sydney University Press.
- Alexander, M. and J. Baxter (2005). "Impacts of work on family life among partnered parents of young children." *Family Matters*(72): 18-25.
- Allan, C., M. O'Donnell and D. Peetz (1999). "More tasks, less secure, working harder: three dimensions of labour utilisation." *Journal of Industrial Relations* 41(4): 519-535.
- Allan, J. (1994). "Parenting Education in Australia." *Children and Society* 8(4): 344-359.
- Allen, S. M. and A. J. Hawkins (1999). "Maternal gatekeeping: mothers' beliefs and behaviors that inhibit greater father involvement in family work." *Journal of Marriage and Family* 61(1): 199-212.
- Anderson, E. (2011). "Updating the outcome: gay athletes, straight teams, and coming out in educationally based sport teams." *Gender and Society* 25(2): 250-268.
- Anderson, J. R. and W. J. Doherty (2005). "Democratic community initiatives: the case of overscheduled children." *Family Relations* 54(5): 654-665.
- Anderson, P., K. Butcher and P. Levine (2003). "Maternal employment and overweight children." *Journal of Health Economics* 22: 477-504.
- Andrew, A. (2009). "Challenging boundaries to 'employability': women apprentices in a non-traditional occupation." *Social Policy and Society* 8(03): 347-359.
- Ansari, Z., N. J. Carson, M. J. Ackland, L. Vaughan and A. Serraglio (2003). "A public health model of the social determinants of health." *Social and Preventive Medicine* 48(4): 242-251.
- Archer, L., A. Halsall and S. Hollingworth (2007). "Class, gender, (hetero)sexuality and schooling: paradoxes within working-class girls' engagement with education and post-16 aspirations." *British Journal of Sociology of Education* 28(2): 165-180.
- Arendell, T. (2000). "Conceiving and investigating motherhood: the decade's scholarship." *Journal of Marriage and the Family* 62(4): 1192-1207.
- Aries, P. (1976). *Centuries of Childhood. Toward a sociology of education*. J. Beck, C. Jenks, N. Keddie and M. Young. New Brunswick, Collier Macmillan Publishers.
- Arnall, J. (2007). *Discipline Without Distress: 135 Tools for Raising Caring, Responsible Children Without Time-Out, Spanking, Punishment, Or Bribery*. Calgary, Professional Parenting Canada.

- Ashley, B., J. Hollows, S. Jones and B. Taylor (2004). *Food and Cultural Studies*. London, Routledge.
- Australian Bureau of Statistics (1999). *Australian Social Trends 1999* (ABS Cat. no. 4102.0). Canberra, Australian Bureau of Statistics.
- Australian Bureau of Statistics (2001). *Australian Social Trends 2001: Housing and Lifestyle: Household amenities* (ABS Cat. no. 4102.0). Canberra, Australian Bureau of Statistics.
- Australian Bureau of Statistics (2003). *Income Distribution, Australia 1999-2000* (ABS Cat. no. 6523.0). Canberra, Australian Bureau of Statistics.
- Australian Bureau of Statistics (2008). *Australian Social Trends 2008 - Labour Force Participation Across Australia* (ABS Cat. no. 4102.0). Canberra, Australian Bureau of Statistics.
- Australian Bureau of Statistics (2009). *One Parent Families with Dependent Children in South Australia* (ABS Cat. no. 1345.4). Canberra, Australian Bureau of Statistics.
- Australian Bureau of Statistics (2010a). *2010 Labour Statistics in Brief* (ABS Cat. no. 6104.0). Canberra, Australian Bureau of Statistics.
- Australian Bureau of Statistics (2011). *Family Characteristics, Australia 2009-10* (ABS Cat. no. 4442.0). Canberra, Australian Bureau of Statistics.
- Australian Bureau of Statistics (2012). *Gender Indicators, Australia Jan 2012* (ABS cat. no. 4125.0) Canberra, Australian Bureau of Statistics.
- Australian Institute of Health and Welfare (1992). *Australia's Health 1992: the third biennial report of the Australian Institute of Health and Welfare*. Canberra, AGPS.
- Australian Institute of Health and Welfare (2003). *Are all Australians gaining weight? Differentials in overweight and obesity among adults, 1989-90 to 2001* (AIHW Cat. no. AUS 39). Canberra, Australian Institute for Health and Welfare.
- Australian Institute of Health and Welfare (2005). *A picture of Australia's children* (AIHW Cat. no. PHE 58). Canberra, Australian Institute of Health and Welfare.
- Australian Work + Family Policy Roundtable (AW+FPR) (2012). *The Fair Work Act Review* Adelaide, Centre for Work + Life, University of South Australia.
- Baber, K. and C. Tucker (2006). "The social roles questionnaire: a new approach to measuring attitudes toward gender." *Sex Roles* 54(7-8): 459-467.
- Bailey, J., F. Macdonald and G. Whitehouse (2012). "'No leg to stand on': the moral economy of Australian industrial relations changes." *Economic and Industrial Democracy* 33(3): 441-461.
- Baird, M., R. Cooper and B. Ellem (2009). "Low-paid women: the impact of regulatory change in Australia." *Industrial Relations Journal* 40(5): 393-407.
- Banwell, C., M. Shipley and L. Strazdins (2007). *The Pressured Parenting Environment: Parents as piggy in the middle. The 7 Deadly Sins of Obesity: How the modern world is making us fat*. J. Dixon and D. Broom. Sydney Australia, UNSW Press.
- Barber, K. (2008). "The well-coiffed man: class, race, and heterosexual masculinity in the hair salon." *Gender and Society* 22(4): 455-476.

- Bardoel, E. A., R. Drago, B. Cooper and C. Colbeck (2011). "Bias avoidance: cross-cultural differences in the US and Australian academies." *Gender, Work and Organization* 18(S1): e157-e179.
- Barnett, R. C. (2004). "Preface: women and work: where are we, where did we come from, and where are we going?" *Journal of Social Issues* 60(4): 667-674.
- Barros, A. and V. Hirakata (2003). "Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio." *BMC Medical Research Methodology* 3: 21.
- Bauer, K. W., M. O. Hearst, K. Escoto, J. M. Berge and D. Neumark-Sztainer (2012). "Parental employment and work-family stress: associations with family food environments." *Social Science and Medicine* 75(3): 496-504.
- Baumrind, D. (1966). "Effects of authoritative parental control on child behavior." *Child Development* 37(4): 887-907.
- Baumrind, D. (1997). "The discipline encounter: contemporary issues." *Aggression and Violent Behavior* 2(4): 321-335.
- Baxandall, R. and L. Gordon (2002). *Second-wave Feminism. A Companion to American Women's History*. N. A. Hewitt. Oxford, Blackwell Publishers Ltd.
- Baxter, J. (2002). *To Marry or Not to Marry: The Impact of Marital Status on the Division of Household Labor*. The NLC Workshop 17-18 May St Lucia, School of Social Sciences, The University of Queensland.
- Baxter, J., B. Hewitt and M. Western (2009). "Who uses paid domestic labor in Australia? Choice and constraint in hiring household help." *Feminist Economics* 15(1): 1-26.
- Benard, S. and S. J. Correll (2010). "Normative discrimination and the motherhood penalty." *Gender and Society* 24(5): 616-646.
- Benson, L. and M. Mokhtari (2011). "Parental employment, shared parent-child activities and childhood obesity." *Journal of Family and Economic Issues* 32(2): 233-244.
- Bergström, E and H. K. Blomquist (2009) "Is the prevalence of overweight and obesity declining among 4 - year - old Swedish children?" *Acta paediatrica* 98(12):1956-1958.
- Berk, L. E. (2005). *Why Parenting Matters. Childhood lost: how American culture is failing our kids*. S. Olfman. Westport, Praeger Publishers.
- Berkman, L. and S. Macintyre (1997). The measurement of social class in health studies: old measures and new formulations. *Social Inequalities and Cancer*. M. Kogevinas, N. Pearce, M. Susser and P. Buffetta. Lyon, International Agency for Research on Cancer. IARC Scientific Publications No. 138.
- Bianchi, S. M. and M. J. Mattingly (2004). *Time, Work, and Family in the United States. Changing Life Patterns in Western Industrial Societies*. J. Z. Giele and E. Holst. Oxford, Elsevier Ltd. 8: 95-118
- Bianchi, S. M., L. C. Sayer, M. A. Milkie and J. P. Robinson (2012). "Housework: who did, does or will do it, and how much does it matter?" *Social Forces* 91(1): 55-63.

- Biggar, R. J. and M. Melbye (1992). "Responses to anonymous questionnaires concerning sexual behavior: a method to examine potential biases." *American Journal of Public Health* 82(11): 1506-1512.
- Birch, L. L. (2006). "Child feeding practices and the etiology of obesity " *Obesity* 14(3): 343-344.
- Birch, L. and K. Davison (2001). "Family environmental factors influencing the developing behavioral controls of food intake and childhood overweight." *Pediatric Clinics of North America* 48(4): 893-907.
- Birch, L. and A. Fisher (1996). *The role of experience in the development of children's eating behaviour. Why We Eat What We Eat: The Psychology of Eating*. E. Capaldi. Washington, American Psychological Association.
- Biro, F. M., and M. Wien (2010). "Childhood obesity and adult morbidities." *The American journal of clinical nutrition*, 91(5):1499S-1505S.
- Bittman, M. (1999). "Parenthood without penalty: time use and public policy in Australia and Finland." *Feminist Economics* 5(3): 27-42.
- Bittman, M. (2004). *Family Time: The Social Organization of Care*. London, Routledge.
- Bittman, M., S. Hoffmann and D. Thompson (2004). *Men's Uptake of Family-friendly Employment Provisions (Policy Research Paper No. 22)*. Canberra, Social Policy Research Centre, University of New South Wales.
- Bittman, M., G. Matheson and G. Meagher (1999). "The changing boundary between home and market: Australian trends in outsourcing domestic labour." *Work, Employment and Society* 13(2): 249-273.
- Bittman, M., J. M. Rice and J. Wajcman (2004). "Appliances and their impact: the ownership of domestic technology and time spent on household work." *The British Journal of Sociology* 55(3): 401-423.
- Blair-Loy, M. (2003). *Competing Devotions: Career and Family Among Women Executives*. Cambridge, Harvard University Press.
- Bloodworth, S. (2004). *Women, Class and Oppression. Class and Struggle in Australia Seminar Series*. Canberra, Australian National University.
- Blomfield, C. J., Barber, B. L. (2011) *Developmental Experiences During Extracurricular Activities and Australian Adolescents' Self-Concept: Particularly Important for Youth from Disadvantaged Schools*. *The Journal of Youth and Adolescence* 40(5): 582-594
- Booth, M. L., T. Chey, M. Wake, K. Norton, K. Hesketh, J. Dollman and I. Robertson (2003). "Change in the prevalence of overweight and obesity among young Australians, 1969-1997." *American Journal of Clinical Nutrition* 77(1): 29-36.
- Booth, M. L., T. Dobbins, A. D. Okely, E. Denney-Wilson and L. L. Hardy (2007). "Trends in the prevalence of overweight and obesity among young Australians, 1985, 1997 and 2004." *Obesity* 15(5): 1089-1095.
- Boris, E. and C. H. Lewis (2006). *Caregiving and Wage-earning: A Historical Perspective on Work and Family*. *The Work and Family Handbook: Multi-disciplinary Perspectives, Methods, and*

- Approaches. M. Pitt-Catsouphes, E. E. Kossek and S. A. Sweet. New Jersey, Lawrence Erlbaum Associates.
- Boswell, W. R. and J. B. Olson-Buchanan (2007). "The use of communication technologies after hours: the role of work attitudes and work-life conflict." *Journal of Management* 33(4): 592-610.
- Bouma, M. (2012). "Baby makes 3." *Domestic Violence Resource Centre Victoria Quarterly Edition* 1 – Autumn.
- Brackertz, N. (2007). *Who is Hard to Reach and Why?* (ISR Working Paper, January 2007). Melbourne, Institute for Social Research, Swinburne University of Technology.
- Braun, A., C. Vincent and S. J. Ball (2008). "'I'm so much more myself now, coming back to work' - working class mothers, paid work and childcare." *Journal of Education Policy* 23(5): 533-548.
- Braun, A., C. Vincent and S. J. Ball (2011). "Working-class fathers and childcare: the economic and family contexts of fathering in the UK." *Community, Work & Family* 14(1): 19-37.
- Braveman, P., C. Cubbin, S. Egerter, S. Chideya, K. S. Marchi, M. Metzler and S. Posner (2005). "Socioeconomic status in health research: one size does not fit all." *Journal of the American Medical Association* 294(22): 2879-2888.
- Brazelton, T. B. (1984). *To Listen to a Child: Understanding the Normal Problems of Growing Up*. Cambridge, Perseus Publishing.
- Brazelton, T. B. and S. I. Greenspan (2000). *The Irreducible Needs of Children: What Every Child Must Have to Grow, Learn and Flourish*. Cambridge, Da Capo Press.
- Brodie, D., V. Moscrip and R. Hutcheon (1998). "Body composition measurement: a review of hydrodensitometry, anthropometry, and impedance methods." *Nutrition* 14(3): 296-310.
- Bromfield, R. (2010). *How to Unspoil Your Child Fast: A Speedy, Complete Guide to Contented Children and Happy Parents*. Naperville, Sourcebooks, Inc.
- Brooks-Gunn, J., W. J. Han and J. Waldfogel (2002). "Maternal employment and child cognitive outcomes in the first three years of life: the NICHD study of early child care." *Child Development* 73(4): 1052-1072.
- Broom, D. and L. Strazdins (2007). *The Harried Environment: Is time pressure making us fat? The 7 Deadly Sins of Obesity: How the Modern World is Making Us Fat*. J. Dixon and D. Broom. Sydney, Australia, UNSW Press.
- Broomhill, R. and R. Sharp (2007). *The Problem of Social Reproduction Under Neoliberalism. Remapping Gender in the New Global Order*. M. G. Cohen and M. J. Brodie. New York, Routledge.
- Brown, J. E., D. H. Broom, J. M. Nicholson and M. Bittman (2010). "Do working mothers raise couch potato kids? Maternal employment and children's lifestyle behaviours and weight in early childhood." *Social Science & Medicine* 70(11): 1816-1824.
- Brown, R., R. Scragg and R. Quigley (2008). *Does the Family Environment Contribute to Food Habits or Behaviours and Physical Activity in Children?* Wellington, Scientific Committee of the Agencies for Nutrition Action.

- Brunner, E. and M. Marmot (2005). *Social Organisation, Stress and Health. Social Determinants of Health*. M. Marmot and R. Wilkinson. Oxford, Oxford University
- Bryson, L. and A. Mackinnon (2000). *Population, Gender and Reproductive Choice: The Motherhood Questions Directions for Policy (Hawke Institute Working Paper Series No 6)*. Magill, The Hawke Institute, University of South Australia.
- Bunting, L., M. A. Webb and J. Healy (2010). "In two minds? — parental attitudes toward physical punishment in the UK." *Children and Society* 24(5): 359-370.
- Burgard, S., J. Stewart and J. Schwartz (2003). *Occupational Status. The Research Network on SES and Health*. J. D. MacArthur and C. T. MacArthur, <http://www.macses.ucsf.edu/Research/socialenviro/occupation.php>.
- Burgess, J. and J. Connell (2005). *Reworking Work: What are the Issues for Australia? Reworking Work: Proceedings of the 19th Conference of AIRAANZ, Volume 1: Refereed Papers*. M. Baird, R. Cooper and M. Westcott. Sydney, the Association of Industrial Relations Academics of Australia and New Zealand 103-110.
- Burke, V., L. Beilin, K. Simmer, W. Oddy, K. Blake, D. Doherty, G. Kendall, J. Newnham, L. Landau and F. Stanley (2005). "Predictors of body mass index and associations with cardiovascular risk factors in Australian children: a prospective cohort study." *International Journal of Obesity* 29: 15-23.
- Burkhauser, R. V. and J. Cawley (2008). "Beyond BMI: The value of more accurate measures of fatness and obesity in social science research." *Journal of Health Economics* 27: 519-529.
- Burns, C., P. Gibbon, R. Boak, S. Baudinette and J. Dunbar (2004). "Food cost and availability in a rural setting in Australia." *Rural and Remote Health* 4(311).
- Burridge, J. and M. Barker (2009). *Food as a Medium for Emotional Management of the Family: Avoiding Complaint and Producing Love. Changing Families, Changing Food*. P. Jackson. Hampshire, Palgrave Macmillan.
- Butera, K. (2008). "Neo-mateship' in the 21st century: changes in the performance of Australian masculinity." *Journal of Sociology* 44(3): 265-281.
- Butler, K. (2010). "Intensive mothering in British Columbia: understanding the impact of an 'investing-in-children' framework on mothering ideology." *International Journal of Canadian Studies* 42: 243-253.
- Cameron, A., T. Welborn, P. Zimmet, D. Dunstan, N. Owen, J. Salmon, M. Dalton, D. Jolley and J. Shaw (2003). "Overweight and obesity in Australia: the 1999-2000 Australian diabetes, obesity and lifestyle study (AusDiab)." *Medical Journal of Australia* 178: 427-432.
- Cameron, N. and E. W. Demerath (2002). "Critical periods in human growth and their relationship to diseases of aging." *Yearbook of Physical Anthropology* 119(S35): 159-184.
- Campbell, I. (2002). "Extended working hours in Australia." *Labour and Industry* 13(1): 91-110.
- Campbell, I. (2005) "Long working hours in Australia: working time regulation and employer pressures." *Centre for Applied Social Research Working Paper Series 2005-2*.

- Campbell, K., D. Crawford, M. Jackson, K. Cashel, A. Worsley, K. Gibbons and L. Birch (2002). "Family food environments of 5-6 year-old children: does socioeconomic status make a difference?" *Asia Pacific Journal of Clinical Nutrition* 11: S553–S561.
- Campo, N. (2009). "'Feminism failed me': childcare, maternity leave and the denigration of motherhood." *Australian Feminist Studies* 24(61): 325-342.
- Campo, N. (2009a). *From superwomen to domestic goddesses: The rise and fall of feminism*. Peter Lang Pub Incorporated.
- Carlson, A. C. (1996). "Gender, children, and social labor: transcending the "family wage" dilemma." *Journal of Social Issues* 52(3): 137-161.
- Catlett, A. T., R. J. Thompson, D. A. Johndrow and M. R. Boshkoff (1993). "Risk status for dropping out of developmental followup for very low birth weight infants." *Public Health Reports* 108(5): 589-594.
- Cattell, R. B. (1966). "The scree test for the number of factors." *Multivariate Behavioral Research* 1(2): 245-276.
- Cavendish, C. (2009). *Do we have to bribe our children to behave?* The Times. London.
- Chan, T. W. and A. Koo (2010). "Parenting style and youth outcomes in the UK." *European Sociological Review*.
- Chao, R. K. and J. D. Willms (2000) "Family income, parenting practices, and childhood vulnerability: a challenge to the "culture of poverty" thesis." *Policy Brief*(9): 155
- Charlesworth, S. and M. Baird (2007). "Getting gender on the agenda: the tale of two organisations." *Women in Management Review* 22(5): 391-404.
- Charlesworth, S. and A. Heron (2012). "New Australian working time minimum standards: reproducing the same old gendered architecture?" *Journal of Industrial Relations* 54(2): 164-181.
- Chase-Lansdale, P. L. and L. D. Pittman (2002). "Welfare reform and parenting: reasonable expectations." *The Future of Children* 12(1): 166-185.
- Chesters, J., J. Baxter and M. Western (2009). "Paid and unpaid work in Australian households: trends in the gender division of labour, 1986-2005." *Australian Journal of Labour Economics* 12(1): 89-107.
- Chia, Y. F. (2008). "Maternal labour supply and childhood obesity in Canada: evidence from the NLSCY." *Canadian Journal of Economics* 41(1): 217-242.
- Christiansen, S. L. and R. O. B. Palkovitz (2001). "Why the 'good provider' role still matters: providing as a form of paternal involvement." *Journal of Family Issues* 22(1): 84-106.
- Christopher, K. (2012). "Extensive mothering: employed mothers' constructions of the good mother." *Gender & Society* 26(1): 73-96.
- Clarisse, B., L. Nikasinovic, R. Poinard, J. Just and I. Momas (2007). "The Paris prospective birth cohort study: which design and who participates?" *European Journal of Epidemiology* 22(3): 203-210.
- Clarke, P. J., P. M. O'Malley, J. E. Schulenberg, and L. D. Johnston (2010). "Midlife health and socioeconomic consequences of persistent overweight across early adulthood: Findings from a

- national survey of American adults (1986–2008)." *American Journal of Epidemiology*, 172(5):540-548.
- Classen, T. and C. Hokayem (2005). "Childhood influences on youth obesity." *Economics & Human Biology* 3(2): 165-187.
- Coad, D. (2002). *Gender Troubles Down Under: Australian Masculinities*. Valenciennes, Presses Universitaires de Valenciennes.
- Cobb-Clark, D., A. Liu and D. Mitchell (1999) "Reassessing the role of child care costs in the work and care decisions of Australian families." Centre for Economic Policy Research, Australian National University.
- Cobb-Clark, D. A. (2012). "That pesky problem of persistent gender bias." *The Australian Economic Review* 45(2): 211-215.
- Cohen, D. A., B. K. Finch, A. Bower and N. Sastry (2006). "Collective efficacy and obesity: the potential influence of social factors on health." *Social Science & Medicine* 62(3): 769-778.
- Cole, T. J., M. C. Bellizzi, K. M. Flegal and W. H. Dietz (2000). "Establishing a standard definition for child overweight and obesity worldwide: international survey." *British Medical Journal* 320: 1240-1243.
- Coles, T. (2008). "Finding space in the field of masculinity: lived experiences of men's masculinities." *The Journal of sociology* 44(3): 233-248.
- Collins, J. (2009). "'Small children dictate home plan': uncovering the influence of childrearing ideals on the design of the modern post-war house." *Australian Historical Studies* 40(2): 197 - 214.
- Commonwealth of Australia (2008). *2007 Australian National Children's Nutrition and Physical Activity Survey- Main Findings*. Canberra, Commonwealth Scientific Industrial Research Organisation.
- Connell, R. W. (2000). *The Men and the Boys*. Berkeley, University of California Press.
- Connell, R. W. (2005). *Masculinities*. Berkeley, University of California Press.
- Cooke, L. P. (2010). *The Politics of Housework. Dividing the Domestic: Men, Women, and Household Work in Cross-National Perspective*. J. Treas and S. Drobic. Stanford, Stanford University Press.
- Costello, A. B. and J. W. Osborne. (2005). "Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis." *Practical Assessment Research & Evaluation* 10(7).
- Costigan, C. L. and M. J. Cox (2001). "Fathers' participation in family research: Is there a self-selection bias?" *Journal of Family Psychology* 15(4): 706-720.
- Cotter, D., J. M. Hermsen and R. Vanneman (2011). "The end of the gender revolution? Gender role attitudes from 1977 to 2008." *American Journal of Sociology* 117(1): 259-289.
- Courtemanche, C. (2007) "Working yourself to death? The relationship between work hours and obesity." Working paper, Washington University of St Louis.

- Courtemanche, C. (2009). "Longer hours and larger waistlines? The relationship between work hours and obesity." *Forum for Health Economics & Policy* 12(2).
- Coveney, J. (2006). *Food, Morals and Meaning: The pleasure and anxiety of eating*. London, Routledge, Taylor and Francis Group.
- Craig, L. (2006). "Does father care mean fathers share?: a comparison of how mothers and fathers in intact families spend time with children " *Gender & Society* 20(2): 259-281.
- Craig, L. (2007). "How employed mothers in Australia find time for both market work and childcare." *Journal of Family and Economic Issues* 28(1): 69–87.
- Craig, L. (2007a). *Male Domestic Labour and Household Fertility*. The Australian Sociological Association (TASA) 2007 Conference. Auckland, New Zealand.
- Craig, L. (2007b). *Contemporary motherhood: the impact of children on adult time*. Hampshire, Ashgate Publishing Limited.
- Craig, L. and A. Powell (2011). "Non-standard work schedules, work-family balance and the gendered division of childcare." *Work, Employment & Society* 25(2): 274-291.
- Craig, L. and P. Siminski (2010). "Men's housework, women's housework, and second births in Australia." *Social Politics: International Studies in Gender, State & Society* 17(2): 235-266.
- Crompton, R. and C. Lyonette (2005). "The new gender essentialism – domestic and family 'choices' and their relation to attitudes." *The British Journal of Sociology* 56(4): 601-620.
- Crouter, A. C. and S. M. McHale (2005). *Work, family and children's time: implications for youth*. Work, Family, Health and Wellbeing, Bianchi, S.M., Casper, L.M. and King, R.B. Mahwah, Lawrence Erlbaum.
- Currie, C., M. Molcho, W. Boyce, B. Holstein, T. Torsheim and M. Richter (2008). "Researching health inequalities in adolescents: The development of the Health Behaviour in School-Aged Children (HBSC) family affluence scale." *Social Science & Medicine* 66(6): 1429-1436.
- Currie, J. (2009). "Healthy, wealthy, and wise: is there a causal relationship between child health and human capital development?" *Journal of Economic Literature* XLVII(1): 87-122.
- Currie, J. and E. Moretti (2003). "Mother's education and the intergenerational transmission of human capital: evidence from college openings." *The Quarterly Journal of Economics* 118(4): 1495-1532.
- D'Souza, R. M., L. Strazdins, M. S. Clements, D. H. Broom, R. Parslow and B. Rodgers (2005). "The health effects of jobs: status, working conditions, or both?" *Australian and New Zealand Journal of Public Health* 29(3): 222-228.
- D'Souza, R. M., L. Strazdins, L. L.-Y. Lim, D. H. Broom and B. Rodgers (2003). "Work and health in a contemporary society: demands, control, and insecurity." *Journal of Epidemiology and Community Health* 57(11): 849–854.
- D'Agostino, R. B., A. Belanger and R. B. D'Agostino, Jr. (1990). "A suggestion for using powerful and informative tests of normality." *The American Statistician* 44(4): 316-321.

- Daly, K. (2005) *The changing culture of parenting. Contemporary Family Trends*. Ottawa, The Vanier Institute of the Family.
- Daniels, S. R. (2009). "The use of BMI in the clinical setting." *Pediatrics* 124: S35-S41.
- Daniels, S. R. (2009). "Complications of obesity in children and adolescents." *International Journal of Obesity*, 33(S60-S65).
- Darrah, C. N., J. M. Freeman and J. A. English-Lueck (2007). *Busier than ever!: Why American families can't slow down*. Stanford, Stanford University Press.
- Davison, K. and L. Birch (2001). "Childhood overweight: a contextual model and recommendations for future research: the international association for the study of obesity." *Obesity Reviews* 2: 159-171.
- Davis, K. D., A. C. Crouter and S. M. McHale (2006). "Implications of shift work for parent-adolescent relationships in dual-earner families." *Family Relations* 55(4): 450-460.
- Davis, S. N. and T. N. Greenstein (2009). "Gender ideology: components, predictors, and consequences." *Annual Review of Sociology* 35: 87-105.
- de Ruijter, E. and T. Van der Lippe (2007). "Effects of job features on domestic outsourcing as a strategy for combining paid and domestic work." *Work and Occupations* 34(2): 205-230.
- De Vaus, D. (2002). "Fertility decline in Australia: a demographic context." *Family Matters* 63(Spring/Summer): 14-21.
- De Vaus, D. (2002a). *Surveys in Social Research*, 5th Edition. Australia, Allen & Unwin.
- De Wilde, J. A., P. van Dommelen, B. J. C Middelkoop and P. H. Verkerk. (2009) "Trends in overweight and obesity prevalence in Dutch, Turkish, Moroccan and Surinamese South Asian children in the Netherlands." *Archives of disease in childhood* 94(10):795-800.
- Deckelbaum, R. and C. Williams (2001). "Childhood obesity: the health issue." *Obesity Research* 9(4): s239-s243.
- Demidenko E. (2007) "Sample size determination for logistic regression revisited." *Statistics in Medicine* 26: 3385-3397
- Demidenko E. (2008) "Sample size and optimal design for logistic regression with binary interaction." *Statistics in Medicine* 27: 36-46
- D'Enbeau, S., P. M. Buzzanell and J. Duckworth (2010). "Problematizing classed identities in fatherhood: development of integrative case studies for analysis and praxis." *Qualitative Inquiry* 16(9): 709-720.
- Deutsch, F. M. and S. E. Saxon (1998). "Traditional ideologies, nontraditional lives." *Sex Roles* 38(5): 331-362.
- Devine, C. M., M. Jastran, J. A. Jabs, E. Wethington, T. J. Farrell and C. A. Bisogni (2006). "'A lot of sacrifices:' work-family spillover and the food choice coping strategies of low wage employed parents." *Social Science & Medicine* 63(10): 2591-2603.
- Dietz, W. H. (1998). "Health consequences of obesity in youth: childhood predictors of adult disease " *Pediatrics* 101(3): 518-525.

- Dietz, W. H. and M. C. Bellizzi (1999). "Introduction: the use of body mass index to assess obesity in children." *The American Journal of Clinical Nutrition* 70(1): 123S-125S.
- Dix, T., D. N. Ruble and R. J. Zambarano (1989). "Mothers' implicit theories of discipline: child effects, parent effects, and the attribution process." *Child Development* 60(6): 1373-1391.
- Dixon, J. and C. Banwell (2004). "Heading the table: parenting and the junior consumer." *British Food Journal* 106(3): 182-193.
- Dixon, J. M., S. J. Hinde and C. L. Banwell (2006). "Obesity, convenience and "phood"." *British Food Journal* 108(8): 634-645.
- Dobson, B., A. Beardsworth, T. Keil and R. Walker (1994). *Diet, Choice and Poverty: Social, cultural and nutritional aspects of food consumption among low-income families*. London, Family Policy Studies Centre.
- Dollman, J. and A. Pilgrim (2007). "Changes in body composition between 1997 and 2002 among South Australian children: influences of socio-economic status and location of residence." *Australian and New Zealand Journal of Public Health* 29(2): 166-170.
- Donahue, R., E. Bloom, R. Abbott, D. Reed and K. Yano (1987). "Central obesity and coronary heart disease in men." *The Lancet* 329(8537): 821-824.
- Dorey, E., V. Roberts, R. Maddison, P. Meagher-Lundberg, R. Dixon and C. Ni Mhurchu (2011). "Children and television watching: a qualitative study of New Zealand parents' perceptions and views." *Child: Care, Health and Development* 36(3): 414-420.
- Drago, R., D. Black and M. Wooden (2004). *Gender and Work Hours Transitions in Australia: Drop Ceilings and Trap-Door Floors* (IZA Discussion Paper No. 1210). Bonn, The Institute for the Study of Labor (IZA).
- Drago, R., D. Black and M. Wooden (2005). "Female breadwinner families." *Journal of Sociology* 41(4): 343-362.
- Drago, R., Y.-P. Tseng and M. Wooden (2004) "Family Structure, Usual and Preferred Working Hours, and Egalitarianism in Australia, Vol. 24. Melbourne Institute of Applied Economic and Social Research.
- Duncan, G. J., M. C. Daly, P. McDonough and D. R. Williams (2002). "Optimal indicators of socioeconomic status for health research." *American Journal of Public Health* 92(7): 1151-1157.
- Duncan, S. (2005). "Mothering, class and rationality." *The Sociological Review* 53(1): 50-76.
- Eagleton, T. (1991). *Ideology: an introduction*. London, Verso
- Eagly, A. H. and V. J. Steffen (1984). "Gender stereotypes stem from the distribution of women and men into social roles." *Journal of Personality and Social Psychology* 46(4): 735-754.
- Ebbeling, C., D. Pawlak and D. Ludwig (2002). "Childhood obesity: public-health crisis, common sense cure." *The Lancet* 360(10): 473-482.
- Eknoyan, G. (2008). "Adolphe Quetelet (1796-1874)—the average man and indices of obesity." *Nephrology Dialysis Transplantation* 23(1): 47-51.

- Ellem, B. (2005). "Putting work in its place: The making of ideal workers and social contracts." *Asia Pacific Journal of Human Resources* 43(2): 238-251.
- Emory, R., M. Caughy, T. R. Harris and L. Franzini (2008). "Neighborhood social processes and academic achievement in elementary school." *Journal of Community Psychology* 36(7): 885-898.
- Employment Law Centre (ELC) (2011). ELC submission for the Federal Minimum Wage Review 2010-11. Leederville, Employment Law Centre of WA (Inc).
- Ensminger, M. E., C. B. Forrest, A. W. Riley, M. Kang, B. F. Green, B. Starfield and S. A. Ryan (2000). "The validity of measures of socioeconomic status of adolescents." *Journal of Adolescent Research* 15(3): 392-419
- Entwislea, D. R. and N. M. Astone (1994). "Some practical guidelines for measuring youth's race/ethnicity and socioeconomic status." *Child Development* 65(6): 1521-1540.
- Equal Opportunity for Women in the Workforce Agency (EOWA) (2012). "Behind the gender pay gap." Canberra, Equal Opportunity for Women in the Workforce Agency.
- Evans, G. W. (2004). "The environment of childhood poverty." *American Psychologist* 59(2): 77-92.
- Evans, M. and J. Kelley (2002). "Changes in public attitudes to maternal employment: Australia, 1984 to 2001." *People and Place* 10(1): 42-57.
- Evans, M. and J. Kelley (2008). "Trends in women's labor force participation in Australia: 1984-2002." *Social Science Research* 37(1): 287-310.
- Fabrigar, L. R., D. T. Wegener, R. C. MacCallum and E. J. Strahan (1999). "Evaluating the use of exploratory factor analysis in psychological research." *Psychological Methods* 4(3): 272-299.
- Fagan, J. and M. Barnett (2003). "The relationship between maternal gatekeeping, paternal competence, mothers' attitudes about the father role, and father involvement." *Journal of Family Issues* 24(8): 1020-1043.
- Falk, I. (2001). *The Future of 'Work' and the Work of the Future* (CRLRA Discussion Paper D5/2001). Launceston, Centre for Research and Learning in Regional Australia, University of Tasmania.
- Farrow, C. V. and J. Blissett (2008). "Controlling feeding practices: cause or consequence of early child weight?" *Pediatrics* 121(1): e164-e169.
- Fear, J. and R. Denniss (2009). *Something for nothing - unpaid overtime in Australia*. The Australia Institute Policy Brief 7: 1-23. Retrieved 14 Aug, 2012, from <https://www.tai.org.au/index.php?q=node%2F19&pubid=702&act=display>
- Fertig, A., G. Glomm and R. Tchernis (2009). "The connection between maternal employment and childhood obesity: inspecting the mechanisms." *Review of Economics of the Household* 7(3): 227-255.
- Flegal, K. M., J. A. Shepherd, A. C. Looker, B. I. Graubard, L. G. Borrud, C. L. Ogden, T. B. Harris, J. E. Everhart and N. Schenker (2009). "Comparisons of percentage body fat, body mass index, waist circumference, and waist-stature ratio in adults." *The American Journal of Clinical Nutrition* 89(2): 500-508.

- Fletcher, R. and J. StGeorge (2011). "Heading into fatherhood - nervously: support for fathering from online dads." *Qualitative Health Research* 21(8): 1101-1114.
- Floro, M. S. and M. Miles (2003). "Time use, work and overlapping activities: evidence from Australia." *Cambridge Journal of Economics* 27(6): 881-904.
- Fox, B. (2001). "The formative years: how parenthood creates gender." *Canadian Review of Sociology* 38(4): 373-390.
- Franklin, J., G. Denyer, K. S. Steinbeck, I. D. Caterson and A. J. Hill (2006). "Obesity and risk of low self-esteem: a statewide survey of Australian children." *Pediatrics* 118: 2481-2487.
- Freedman, D. S., L. K. Khan, M. K. Serdula, W. H. Dietz, S. R. Srinivasan and G. S. Berenson (2005). "The relation of childhood BMI to adult adiposity: the bogalusa heart study." *Pediatrics* 115(1): 22-27.
- Freeman, E., R. Fletcher, C. E. Collins, P. J. Morgan, T. Burrows and R. Callister (2011). "Preventing and treating childhood obesity: time to target fathers." *International Journal of Obesity* 36(1): 12-15.
- Fuegen, K., M. Biernat, E. Haines and K. Deaux (2004). "Mothers and fathers in the workplace: how gender and parental status influence judgments of job-related competence." *Journal of Social Issues* 60(4): 737-754.
- Fujimoto, Y., F. Azmat and C. Hartel (2011). "Gender perceptions of work-life balance: management implications for full-time employees in Australia." *Australian Journal of Management*.
- Galobardes, B., J. Lynch and G. D. Smith (2007). "Measuring socioeconomic position in health research." *British Medical Bulletin*: 1-17.
- Galobardes, B., A. Morabia and M. S. Bernstein (2001). "Diet and socioeconomic position: does the use of different indicators matter?" *International Journal of Epidemiology* 30(2): 334-340.
- Galobardes, B., M. Shaw, D. A. Lawlor, J. W. Lynch and G. D. Smith (2006a). "Indicators of socioeconomic position (part 2)." *Journal of Epidemiology and Community Health* 60: 95-101.
- Galobardes, B., M. Shaw, D. A. Lawlor, J. W. Lynch and G. D. Smith (2006b). "Indicators of socioeconomic position (part 1)." *Journal of Epidemiology and Community Health* 60: 7-12.
- Garfield, C. F. and A. J. Isacco Iii (2012). "Urban fathers' involvement in their child's health and healthcare." *Psychology of Men & Masculinity* 13(1): 32-48.
- Garnett, S. P., L. A. Baur and C. T. Cowell (2011). "The prevalence of increased central adiposity in Australian school children 1985 to 2007." *Obesity Reviews* 12(11): 887-896.
- Gatrell, C. (2005). *Hard labour: the sociology of parenthood*. Berkshire, Open University Press
- Geist, C. (2005). "The welfare state and the home: regime differences in the domestic division of labour." *European Sociological Review* 21(1): 23-41.
- Gelman, S. A. and M. G. Taylor (2000). *Gender essentialism in cognitive development. Toward a feminist developmental psychology*. P. H. Miller and E. K. Scholnick. New York, Routledge.

- Gershuny, J. (2005). "Busyness as the badge of honor for the new superordinate working class." *Social research* 72(2): 287-314.
- Gewirtz, S. (2001). "Cloning the Blairs: new Labour's programme for the re-socialization of working-class parents." *Journal of Education Policy* 16(4): 365 - 378.
- Gillies, V. (2005). "Raising the 'meritocracy': parenting and the individualization of social class " *Sociology* 39(5): 835-853.
- Gillies, V. (2006). "Parenting, class and culture: exploring the context of childrearing." *Community Practitioner* 79(4): 114-117.
- Gillies, V. (2009). "Understandings and experiences of involved fathering in the United Kingdom: exploring classed dimensions." *The ANNALS of the American Academy of Political and Social Science* 624(1): 49-60.
- Goodin, R., J. M. Rice, M. Bittman and P. Saunders (2005). "The time-pressure illusion: discretionary time vs. free time." *Social Indicators Research* 73: 43-70.
- Goodman, S., P. R. Lewis, A. J. Dixon and C. A. Travers (2002). "Childhood obesity: of growing urgency." *Medical Journal of Australia* 176(8): 400-401.
- Gordis, L. (2004). *Epidemiology*, 3rd Edition. Philadelphia, Elsevier Saunders.
- Gordon, J. (2012). "Wages in managed markets: an explanation of the gender wage gap?" *The Australian Economic Review* 45(2): 216–231.
- Gorman, K. A. and B. A. Fritzsche (2002). "The good-mother stereotype: stay at home (or wish that you did!)." *Journal of Applied Social Psychology* 32(10): 2190-2201.
- Gortmaker, S. L., A. Must, J. M. Perrin, A. M. Sobol and W. H. Dietz (1993). "Social and economic consequences of overweight in adolescence and young adulthood." *New England Journal of Medicine* 329(14): 1008-1012.
- Goward, P. (2005). *Working With Men to Strike a Balance*. the 17th Women, Management and Employment Relations Conference. Sydney, Australian Human Rights Commission.
- Graebner, W. (1980). "The unstable world of Benjamin Spock: social engineering in a democratic culture, 1917-1950." *The Journal of American History* 67(3): 612-629.
- Gray, M. R. and L. Steinberg (1999). "Unpacking authoritative parenting: reassessing a multidimensional construct." *Journal of Marriage and Family* 61(3): 574-587.
- Green, T., J. Owen, P. Curtis, G. Smith, P. Ward and P. Fisher (2009). *Making Healthy Families? Changing Families, Changing Food*. P. Jackson. Hampshire, Palgrave Macmillan.
- Grieshaber, S. (1997). "Mealtime rituals: power and resistance in the construction of mealtime rules." *The British journal of sociology* 48(4): 649.
- Grundy, E. and G. Holt (2001). "The socioeconomic status of older adults: How should we measure it in studies of health inequalities?" *Journal of Epidemiology and Community Health* 55(12): 895-904.
- Guillaume, M. I. (1999). "Defining obesity in childhood: current practice." *The American Journal of Clinical Nutrition* 70(1): 126S-130S.

- Guthrie, J. F., B.-H. Lin and E. Frazao (2002). "Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: changes and consequences." *Journal of Nutrition Education and Behavior* 34(3): 140-150.
- Hafen, B. (1977). "Puberty, privacy and protection: the risks of children's "rights"." *American Bar Association Journal* 63: 1383-1388.
- Hafen, B. and J. Hafen (1996). "Abandoning children to their autonomy: the United Nations convention on the rights of the child." *Harvard International Law Journal* 37(2): 449-491.
- Hagelskamp, C., D. Hughes, H. Yoshikawa and A. Chaudry (2011). "Negotiating motherhood and work: a typology of role identity associations among low-income, urban women." *Community, Work & Family*.
- Hakim, C. (1995). "Five feminist myths about women's employment." *The British Journal of Sociology* 46(3): 429-455.
- Hakim, C. (2003a). *Competing family models, competing social policies*. The Annual Conference of the Australian Institute for Family Studies. Melbourne.
- Hall, M. and B. Gough (2011). "Magazine and reader constructions of 'metrosexuality' and masculinity: a membership categorisation analysis." *Journal of Gender Studies* 20(1): 67-86.
- Hardy, L., King L, Espinel P, Cosgrove C and Bauman A (2011). *NSW Schools Physical Activity and Nutrition Survey (SPANS) 2010: Full Report*. Sydney, Australia, NSW Ministry of Health.
- Han, J. C., D. A. Lawlor, and S. Kimm (2010). "Childhood obesity." *The Lancet*, 375(9727):1737-1748.
- Harrison, W. C. (2006). *The Shadow and the Substance: The Sex/Gender Debate*. Handbook of gender and women's studies. K. Davis, M. Evans and J. Lorber. London, Sage Publishing Ltd.
- Hart, M. S. and M. L. Kelley (2006). "Fathers' and mothers' work and family issues as related to internalizing and externalizing behavior of children attending day care." *Journal of Family Issues* 27(2): 252-270.
- Hawkins, S., T. Cole and C. Law (2008). "Maternal employment and early childhood overweight: findings from the UK Millennium cohort study." *International Journal of Obesity* 32: 30-38.
- Hays, S. (1996). *The Cultural Contradictions of Motherhood*. New Haven, Yale University Press.
- Hays, S. (1997). *The Ideology of Intensive Mothering: A Cultural Analysis of the Bestselling "Gurus" of Appropriate Childrearing*. *Sociology to cultural studies: new perspectives*. E. Long. Oxford, Blackwell Publishers Ltd.
- Hays, S. (2003). *Flat broke with children: women in the age of welfare reform*. New York, Oxford University Press.
- Hegewisch, A. (2009). *Flexible working policies: a comparative review*. Manchester, Institute for Women's Policy Research.
- Heilman, M. E. and T. G. Okimoto (2008). "Motherhood: A potential source of bias in employment decisions." *Journal of Applied Psychology* 93(1): 189-198.

- Henly, J. R., H. L. Shaefer and E. Waxman (2006). "Nonstandard work schedules: Employer - and employee - driven flexibility in retail jobs." *Social Service Review* 80(4):609-634.
- Henwood, K. and J. Procter (2003). "The 'good father': Reading men's accounts of paternal involvement during the transition to first-time fatherhood." *British Journal of Social Psychology* 42(3): 337-355.
- Hertz, R. (2004). "The contemporary myth of choice." *The ANNALS of the American Academy of Political and Social Science* 596(1): 232-244
- Hesketh, K., D. Crawford, J. Salmon, M. Jackson and K. Campbell (2007). "Associations between family circumstance and weight status of Australian children." *International Journal of Pediatric Obesity* 2(2): 86-96.
- Hilbrecht, M., S. M. Shaw, L. C. Johnson and J. Andrey (2008). "'I'm home for the kids': contradictory implications for work-life balance of teleworking mothers." *Gender, Work and Organization* 15(5): 454-476.
- Hill, E. J. S. Carroll, B. Jones, L. Buswell, T. Fackrell and A. Galovan (2011). "Temporal workplace flexibility and associated work-life outcomes for professionals. creating balance?" S. Kaiser, M. J. Ringlsetter, D. R. Eikhof and M. Pina e Cunha, Springer Berlin Heidelberg: 209-223.
- Hill, J. L., J. Waldfogel, J. Brooks-Gunn and W.-J. Han (2005). "Maternal employment and child development: a fresh look using newer methods." *Developmental Psychology* 41(6): 833-850.
- Hitchman, C., I. Christie, M. Harrison and T. Lang (2002). *Inconvenience Food: The Struggle to Eat Well on a Low Income*. London, Demos.
- Hochschild, A. and A. Machung (1989). *The second shift: Working parents and the revolution at home*. New York: Viking, Penguin.
- Holden, L., P. A. Scuffham, M. F. Hilton, N. N. Vecchio and H. A. Whiteford (2010). "Work performance decrements are associated with Australian working conditions, particularly the demand to work longer hours." *Journal of Occupational and Environmental Medicine* 53(3): 281-290.
- Holloway, S. and G. Valentine (2005). *Children's geographies and the new social studies of childhood*. *Childhood: Critical Concepts in Sociology*. C. Jenks. New York, Routledge.
- Holsten, J. E., J. A. Deatrick, S. Kumanyika, J. Pinto-Martin and C. W. Compher (2012). "Children's food choice process in the home environment. A qualitative descriptive study." *Appetite*, 58(1):64-73.
- Holton, S., J. Fisher and H. Rowe (2009). "Attitudes toward women and motherhood: their role in Australian women's childbearing behaviour." *Sex Roles* 61(9): 677-687.
- Hoobler, J. M., S. J. Wayne and G. Lemmon (2009). "Bosses' perceptions of family-work conflict and women's promotability: glass ceiling effects." *Academy of Management Journal* 52(5): 939-957.
- Hook, J. L. (2010). "Gender inequality in the welfare state: sex segregation in housework, 1965-2003." *American journal of sociology* 115(5): 1480-1523.

- Hu, F. B. (2008). *Measurements of Adiposity and Body Composition*. Obesity epidemiology. F. B. Hu. New York, Oxford University Press.
- Humbert, A. L. and S. Lewis (2008). "I Have No Life Other Than Work" - Long Working Hours, Blurred Boundries and Family Life: The Case of Irish Entrepreneurs. The long work hours culture: causes, consequences and choices. R. J. Burke and C. L. Cooper. Bingley, Emerald Group Publishing Limited.
- Hupalo, P. and K. Herden (1999). Health policy and inequality. Occasional Papers: New Series No. 5. Canberra, Department of Health and Aged Care.
- Jabs, J., C. M. Devine, C. A. Bisogni, T. J. Farrell, M. Jastran and E. Wethington (2007). "Trying to find the quickest way: employed mothers' constructions of time for food." *Journal of Nutrition Education and Behaviour* 39: 18-25.
- Jacobs, J. and K. Gerson (2004). *The Time Divide: Work, Family and Gender Inequality*. Cambridge, Harvard University Press.
- Janssen, I., P. Katzmarzyk, S. Srinivasan, W. Chen, R. Malina, C. Bouchard and G. Berenson (2005). "Utility of childhood BMI in the prediction of adulthood disease: comparison of national and international references." *Obesity Research* 13(6): 1106-1115.
- Janssen, S. and U. Backes-Gellner (2011) "Occupational stereotypes, gender segregation and job satisfaction." Retrieved 26 Nov, 2011, from [http://www.eale.nl/conference2011/programme/papers%20sessie%20E/add157019\\_9IRJt1x379.pdf](http://www.eale.nl/conference2011/programme/papers%20sessie%20E/add157019_9IRJt1x379.pdf)
- Jennings, A., Welch, A., Jones, A. P., Harrison, F., Bentham, G., Van Sluijs, E. M., Griffin, S. J., and Cassidy, A. (2011). Local food outlets, weight status, and dietary intake: associations in children aged 9–10 years. *American journal of preventive medicine*, 40(4), 405-410.
- Jefferson, A. (2006). "Breaking down barriers – examining health promoting behaviour in the family. Kellogg's Family Health Study 2005." *Nutrition Bulletin* 31(1): 60-64.
- Johnson, R. K., H. Smiciklas-Wright, A. C. Crouter and F. K. Willits (1992). "Maternal employment and the quality of young children's diets: empirical evidence based on the 1987-1988 Nationwide Food Consumption Survey." *Pediatrics* 90(2): 245-249.
- Johnston, D. D. and D. H. Swanson (2003). "Invisible mothers: a content analysis of motherhood ideologies and myths in magazines." *Sex Roles* 49(1/2): 21-33.
- Johnston, D. D. and D. H. Swanson (2006). "Constructing the "good mother": the experience of mothering ideologies by work status." *Sex Roles* 54(7-8): 509-519.
- Josselyn, I. M. and R. S. Goldman (1949). "Should mothers work." *Social Service Review* 23(1): 74-87.
- Kaiser, H. (1958). "The varimax criterion for analytic rotation in factor analysis." *Psychometrika* 23(3): 187-200.
- Kaiser, H. F. (1960). "The application of electronic computers to factor analysis." *Educational and Psychological Measurement* 20(1): 141-151.

- Kalb, G. (2009). "Children, labour supply and child care: challenges for empirical analysis." *Australian Economic Review* 42(3): 276-299.
- Kaplan, G. and J. Keil (1993). "Socioeconomic factors and cardiovascular disease: a review of the literature." *Circulation* 88: 1973-1998.
- Karnes, M. B., J. A. Teska, A. S. Hodgins and E. D. Badger (1970). "Educational intervention at home by mothers of disadvantaged infants." *Child Development* 41(4): 925-935.
- Katz, K. S., A. El-Mohandes, D. M. Johnson, M. Jarrett, A. Rose and M. Cober (2001). "Retention of low income mothers in a parenting intervention study." *Journal of Community Health* 26(3): 203-218.
- Kirk, D., A. O'Connor, T. Carlson, P. Burke, K. Davis and S. Glover (1997). "Time commitments in junior sport: social consequences for participants and their families." *Physical Education & Sport Pedagogy* 2(1): 51-73.
- Kissebah, A. H., N. Vydelingum, R. Murray, D. J. Evans, R. K. Kalkhoff and P. W. Adams (1982). "Relation of body fat distribution to metabolic complications of obesity." *Journal of Clinical Endocrinology & Metabolism* 54(2): 254-260.
- Kite, M. E., K. Deaux and E. L. Haines (2008). *Gender Stereotypes. Psychology Of Women: Handbook Of Issues And Theories 2nd Edition*. F. Denmark and M. A. Paludi. Westport, Praeger Publishers.
- Kleinberg, J. S. (1999). "The no-win Mom: motherland in twentieth-century America." *Women's History Review* 8(2): 387-395.
- Kluwer, E. S., J. A. M. Heesink and E. Van DeVliert (1997). "The marital dynamics of conflict over the division of labor." *Journal of Marriage and Family* 59(3): 635-653.
- Kmec, J. A. (2011). "Are motherhood penalties and fatherhood bonuses warranted? Comparing pro-work behaviors and conditions of mothers, fathers, and non-parents." *Social Science Research* 40(2): 444-459.
- Kohn, A. (1993). *Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, A's, Praise, and Other Bribes*. Boston, Houghton Mifflin Company.
- Kohn, M. (1989). *Class and conformity: a study in values*. Chicago, Midway Reprint.
- Kohn, M. L. (1959). "Social class and parental values." *The American Journal of Sociology* 64(4): 337-351.
- Koops, W. (2008). *Historical reframing of childhood*. Abridged address to the Utrecht University, Faculty of Social and Behavioural Sciences. Utrecht, Utrecht University.
- Kossek, E. E., S. Lewis and L. B. Hammer (2009). "Work-life initiatives and organizational change: Overcoming mixed messages to move from the margin to the mainstream." *Human Relations* 63(1): 3-19.
- Kremer-Sadlik, T. and A. L. Paugh (2007). "Everyday moments: finding 'quality time' in American working families." *Time & Society* 16(2-3): 287-308.

- Krieger, N., D. R. Williams and N. E. Moss (1997). "Measuring social class in us public health research: concepts, methodologies, and guidelines." *The Annual Review of Public Health* 18: 341–378.
- Kuhlthau, K. A. and J. M. Perrin (2001). "Child health status and parental employment." *The Archives of Pediatrics & Adolescent Medicine* 155(12): 1346-1350.
- Kunst, A. and J. Mackenbach (1994). *Measuring socioeconomic inequalities in health*. Copenhagen, World Health Organization.
- Lareau, A. (2002). "Invisible inequality: social class and childrearing in black families and white families." *American Sociological Review* 67(5): 747-776.
- Lareau, A. (2003). *Concerted Cultivation and the Accomplishment of Natural Growth. Unequal childhoods: class, race, and family life*. A. Lareau. Berkeley, University of California Press.
- Larsen, A. (1999). "Governing families with young children through discipline." *Journal of Sociology* 35(3): 279-296.
- Laybourn, A. (1986). "Traditional strict working class parenting—an undervalued system." *British Journal of Social Work* 16: 625-644.
- Leach, P. (1994). *Your Baby and Child: From Birth to Age Five*. London, Penguin.
- LeMaster, J., A. Marcus-Newhall, B. J. Casad and N. Silverman (2004). *Life Experiences of Working and Stay-at-Home Mothers. The Psychology of Prejudice and Discrimination: Bias based on gender and sexual orientation, Volume 3*. J. Lau Chin. Westport, Praeger Publishers.
- Li, J., S. Johnson, W.-J. Han, S. Andrews, G. Kendall, L. Strazdins and A. M. Dockery (2012). "Parents' nonstandard work and child wellbeing: A critical review of the existing literature. CLMR Discussion Paper Series 2012/02". Perth, The Centre for Labour Market Research, Curtin Business School, Curtin University.
- Li, M., K. Byth and C. J. Eastman (2007). "Childhood overweight and obesity by Socio-economic Indexes for Areas." *Medical Journal of Australia* 187(3): 195.
- Lips, H. M. (1997). *Sex and Gender: An introduction*. Mountain View, Mayfield Publishing Company.
- Lissner, L., A. Sohlström, E. Sundblom and A. Sjöberg (2010) "Trends in overweight and obesity in Swedish schoolchildren 1999–2005: has the epidemic reached a plateau?" *Obesity reviews* 11(8):553-559.
- Lobstein, T., L. Baur and R. Uauy (2004). "Obesity in children and young people: a crisis in public health." *Obesity reviews* 5(Suppl. 1): 4-85.
- Lucas, K. and S. J. Steimel (2009). "Creating and responding to the gen(d)eralized other: women miners' community-constructed identities." *Women's Studies in Communication* 32(3): 320 - 347.
- Luks, S. and H. E. Brady (2003). "Defining welfare spells: coping with problems of survey responses and administrative data." *Evaluation Review* 27(4): 395-420.

- Lundberg, J. (2008). *Social Status – a State of Mind? Objective and Subjective Measures of Social Status and Associations with Psychosocial Factors, Emotions, and Health*. Linköping, Linköping University Electronic Press
- Lupton, D. and L. Barclay (1997). *Constructing fatherhood: discourses and experiences*. London, Sage Publications.
- Luxton, M. (2001). "Feminism as a class act: working-class feminism and the women's movement in Canada." *Labour* 48(Fall): 63-88.
- Lynch, J. and G. Kaplan (2000). *Socioeconomic Factors*. Social Epidemiology. L. Berkman and I. Kawachi. New York, Oxford Press
- Magarey, A., L. Daniels and T. Boulton (2001). "Prevalence of overweight and obesity in Australian children and adolescents: reassessment of 1985 and 1995 data against new standard international definitions." *Medical Journal of Australia* 174: 561–564.
- Magarey, A. M., L. A. Daniels, T. J. Boulton and R. A. Cockington (2003). "Predicting obesity in early adulthood from childhood and parental obesity." *International Journal of Obesity and Related Metabolic Disorders* 27(4): 505-513.
- Mann, C. J. (2003). "Observational research methods. Research design II: cohort, cross sectional, and case-control studies." *Emergency Medicine Journal* 20: 54-60.
- Mann, S. A. and D. J. Huffman (2005). "The decentering of second wave feminism and the rise of the third wave." *Science & Society* 69(1): 56-91.
- Marmot, M., J. Siegrist, T. Theorell and A. Feeney (1999). *Health and the psychosocial environment at work. Social Determinants of Health*. M. Marmot and R. Wilkinson. New York, Oxford University Press: p105-131.
- Martin, J. L. (2008a). *Shifting the Load: Personality Factors and Women in the Workplace. The Psychology of Women at Work*. M. A. Paludi. Westport, Praeger Publishers.
- McCann, D. (2007). "Temporal autonomy and the protective individualisation of working-time law: the case of overtime work." *Labour & Industry* 17(3): 29-43.
- McCant, J. W. (1987). "The cultural contradiction of fathers as nonparents." *Family Law Quarterly* 21: 127-143.
- McClelland, A., J. Pirkis and S. Willcox (1992). *Enough to make you sick: how income and environment affect health: National Health Strategy Research Paper Number 1*. Melbourne, National Health Strategy Unit.
- McCracken, K. (2001). "Into a SEIFA SES cul-de-sac?" *Australian and New Zealand Journal of Public Health* 25(4): 305-306.
- McDonald, P. (1997). "Contemporary fertility patterns in Australia: first data from the 1996 Census." *People and Place* 6(1): 1-13.
- McDonald, P. (2001). "Family support policy in Australia: the need for a paradigm shift." *People and Place* 9(2): 14-20.

- McDonough, P., D. R. Williams, J. S. House and G. J. Duncan (1999). "Gender and the socioeconomic gradient in mortality." *Journal of Health and Social Behavior* 40(1): 17-31.
- McMahon, A. (1998). "'Blokus domesticus: the sensitive new age guy in Australia'." *Journal of Australian Studies* 22(56): 147-157.
- Mellor, J. M., R. B. Rapoport and D. Maliniak (2008). "The impact of child obesity on active parental consent in school-based survey research on healthy eating and physical activity." *Evaluation Review* 32(3): 298-312.
- Mendes, P. (2009). "Retrenching or renovating the Australian welfare state: the paradox of the Howard government's neo-liberalism." *International Journal of Social Welfare* 18(1): 102-110.
- Merskin, D. (2008). "Caring about caring: gender, subjectivity, and parenting." *Sex Roles* 59(11-12): 909-911.
- Messner, M. A. (1993). "'Changing men" and feminist politics in the United States." *Theory and Society* 22(5): 723-737.
- Meteyer, K. and M. Perry-Jenkins (2010). "Father involvement among working-class, dual-earner couples." *Fathering: A Journal of Theory, Research, & Practice about Men as Fathers* 8(3): 379-403.
- Milkie, M. A. (2012). "Social and cultural resources for and constraints on new mothers' marriages." *Journal of Marriage and Family* 73(1): 18-22.
- Millar, L., P. Kremer, A. de Silva-Sanigorski, M. P. McCabe, H. Mavoa, M. Moodie, J. Utter, C. Bell, M. Malakellis, L. Mathews, G. Roberts, N. Robertson and B. A. Swinburn (2011). "Reduction in overweight and obesity from a 3-year community-based intervention in Australia: the 'It's Your Move!' project." *Obesity Reviews* 12: 20-28.
- Miller, D. P. and W. J. Han (2008). "Maternal nonstandard work schedules and adolescent overweight." *American Journal of Public Health* 98(8): 1495-1502.
- Millward, C. (2002). "Work rich, family poor: non-standard working hours and family life." *Family Matters* 61(Autumn): 40-47.
- Mnookin, R. (1978). "Children's rights: beyond kiddie libbers and child savers." *Journal of Clinical Child Psychology* 7(3): 163-167.
- Moen, P. (2011). "From 'work-family' to the 'gendered life course' and 'fit': five challenges to the field." *Community, Work & Family* 14(1): 81-96.
- Moore, V. M., M. J. Davies, K. J. Willson, A. Worsley and J. S. Robinson (2004). "Dietary composition of pregnant women is related to size of the baby at birth." *Journal of Nutrition* 134(7): 1820-1826.
- Moran, R. F. (2004). "How second-wave feminism forgot the single woman." *Hofstra Law Review* 223(33): 285-298.
- Morgan, M. Y. and J. Scanzoni (1987). "Religious orientations and women's expected continuity in the labor force." *Journal of Marriage and Family* 49(2): 367-379.

- Morgan, P. J., D. R. Lubans, R. Callister, A. D. Okely, T. L. Burrows, R. Fletcher and C. E. Collins (2011). "The 'Healthy Dads, Healthy Kids' randomized controlled trial: efficacy of a healthy lifestyle program for overweight fathers and their children." *International Journal of Obesity* 35(3): 436-447.
- Najman, J. M., M. E. Shaw, W. Bor, M. O'Callaghan, G. Williams and M. Anderson (1994). "Working class authoritarianism and child socialization: an Australian study." *Australian Journal of Marriage & Family* 15(3): 137-146.
- Naylor, B. and B. B. Saunders (2009). "Whose rights? Children, parents and discipline." *Alternative Law Journal* 34(2): 80-85.
- Neuhaus, J. (2001). *Women and Cooking in Marital Sex Manuals. Kitchen Culture in America: Popular Representations of Food, Gender and Race*. S. A. Inness. Philadelphia, University of Pennsylvania Press.
- NGO Committee on Education. "Geneva Declaration of the Rights of the Child." Retrieved 3 May, 2011, from <http://www.un-documents.net/gdrc1924.htm>.
- Nicholson, A. (2008). "Choose to hug, not hit." *Family Court Review* 46(1): 11-36.
- Nicholson, L. (1994). "Interpreting gender." *Signs* 20(1): 79-105.
- Noble, G. (2007). "The paradoxical food buying behaviour of parents: insights from the UK and Australia." *British Food Journal* 109(5): 387.
- Norton, J., D. Harker and M. Harker (2009). "Are parents overfeeding and indulging? Qualitative insights for social marketers into child obesity." *The 2009 Australian and New Zealand Marketing Academy Conference: Sustainable Management and Marketing*. Melbourne, Australian and New Zealand Marketing Academy
- O'Dea, J. A., T. D. Nguyen-Hoang and M. J. Dibley (2011). "Plateau in obesity and overweight in a cross sectional study of low, middle and high socioeconomic status schoolchildren between 2004 and 2009." *International Journal of Public Health* 56(6): 663-667.
- Oakes, J. M. and P. H. Rossi (2003). "The measurement of SES in health research: current practice and steps toward a new approach." *Social Science & Medicine* 56(4): 769-784.
- O'Dea, J. (2007). "Are we OK or are we not?" *Journal of the Home Economics Institute of Australia* 14(3): 6-14.
- O'Dea, J. (2008). "Gender, ethnicity, culture and social class influences on childhood obesity among Australian schoolchildren: Implications for treatment, prevention and community education." *Health & Social Care in the Community* 16(3): 282-290.
- O'Dea, J., T. H. Nguyen Hoang and M. Dibley (2011). "Plateau in obesity and overweight in a cross sectional study of low, middle and high socioeconomic status schoolchildren between 2004 and 2009." *International Journal of Public Health* 56(6): 663-667.
- O'Dea, J. A. and M. J. Dibley (2010). "Obesity increase among low SES Australian schoolchildren between 2000 and 2006: time for preventive interventions to target children from low income schools?" *International Journal of Public Health* 55(3): 185-192.

- O'Dea, J. A. and R. Wilson (2006). "Socio-cognitive and nutritional factors associated with body mass index in children and adolescents: possibilities for childhood obesity prevention." *Health Education Research* 21(6): 796-805.
- Ogden, C. L., M. D. Carroll, L. R. Curtin, M. M. Lamb and K. M. Flegal (2010) "Prevalence of High Body Mass Index in US Children and Adolescents, 2007-2008." *The Journal of the American Medical Association* 303(3):242-249.
- Ogden, C. L., M. D. Carroll, and K. M. Flegal (2008). "High body mass index for age among US children and adolescents." *The Journal of the American Medical Association* 299(20):2401-5.
- Olds, T., J. Dollman, K. Norton and N. Harten (2001). "A century of growth in Australian children." *Medicine and Sport Science* 44: 85-103.
- Olds, T., K. Ferrar, G. Tomkinson and C. Maher (2009). "Childhood obesity: the end of the epidemic?" *Australasian Epidemiologist* 16(1): 16-19.
- Olds, T., C. Maher, S. Zumin, S. Péneau, S. Lioret, K. Castetbon, J. De Wilde, M. Hohepa, R. Maddison, L. Lissner, A. Sjöberg, M. Zimmermann, I. Aeberli, C. Ogden, K. Flegal, C. Summerbell (2011) "Evidence that the prevalence of childhood overweight is plateauing: data from nine countries." *International Journal of Pediatric Obesity* 6(5 - 6):342-360.
- Olds, T., G. Tomkinson, K. Ferrar and C. Maher (2010). "Trends in the prevalence of childhood overweight and obesity in Australia between 1985 and 2008." *International Journal of Obesity* 34: 57-66.
- Olds, T. S. and N. R. Harten (2001). "One hundred years of growth: the evolution of height, mass, and body composition in Australian children, 1899-1999." *Human Biology* 73(5): 727-738.
- Palmerus, K. E. and S. W. Scarr (1995). How Swedish parents discipline young children: Cultural comparisons and individual differences. The biennial meeting of the Society for Research in Child Development (61st, Indianapolis, IN, March 30-April 2, 1995). Indianapolis.
- Pappas, G. (1994). "Elucidating the relationships between race, socioeconomic status, and health." *American Journal of Public Health* 84(6): 892-893.
- Parents Magazine (2000). *The parents book of lists: from birth to age three: everything you need to know, do, and buy to keep your child happy, healthy, and safe.* New York, St. Martin's Press.
- Pateman, C. (2000). *The Patriarchal Welfare State. Readings in contemporary political sociology.* K. Nash. Oxford, Blackwell Publishers Inc.
- Patrick, H., and T. A. Nicklas (2005). "A review of family and social determinants of children's eating patterns and diet quality." *Journal of the American College of Nutrition* 24(2):83-92.
- Patton, G. C., and R. Viner (2007). "Pubertal transitions in health." *The Lancet*, 369(9567):1130-1139.
- Pease, B. (2001). *Moving beyond mateship: Reconstructing Australian Men's Practices. A Man's World? Changing Men's Practices in a Globalised World.* B. Pease and K. Pringle. New York, Palgrave.
- Pedersen, D. E. (2012). "The good mother, the good father, and the good parent: gendered definitions of parenting." *Journal of Feminist Family Therapy* 24(3): 230-246.

- Peek, C. W., G. D. Lowe and L. S. Williams (1990). "Gender and God's word: another look at religious fundamentalism and sexism." *Social Forces* 69(4): 1205-1221.
- Peetz, D., K. Townsend, B. Russell, C. Houghton, A. Fox and C. Allan (2003). "Race against time: extended hours in Australia." *Australian Bulletin of Labour* 29(2): 126-142.
- Péneau, S., B. Salanave, L. Maillard-Teyssier, M-F. Rolland-Cachera, A-C. Vergnaud, C. Méjean, S. Czernichow, S. Vol, J. Tichet, K. Castetbon and S. Hercberg (2009). "Prevalence of overweight in 6- to 15-year-old children in central/western France from 1996 to 2006: trends toward stabilization." *International Journal of Obesity* 33:401–407
- Perry-Jenkins, M. and K. Folk (1994). "Class, couples, and conflict: effects of the division of labor on assessments of marriage in dual-earner families." *Journal of Marriage and Family* 56(1): 165-180.
- Phipp, S., L. Lethbridge and P. Burton (2006). "Long-run consequences of parental paid work hours for child overweight status in Canada." *Social Science and Medicine* 62: 977-986.
- Pietrobelli, A., M. Faith, D. Allison, D. Gallagher, G. Chiumello and S. Heymsfield (1998). "Body mass index as a measure of adiposity among children and adolescents: a validation study." *The Journal of Pediatrics* 132(2): 204-210.
- Pilcher, J. (2000). "Domestic divisions of labour in the twentieth century." *Work, Employment and Society* 14(04): 771-780.
- Plantin, L. (2007). "Different classes, different fathers? -- on fatherhood, economic conditions and class in Sweden." *Community, Work & Family* 10(1): 93-110.
- Pocock, B. (1999). "Equal pay thirty years on: the policy and practice." *Australian Economic Review* 32(3): 279-285.
- Pocock, B. (2003). *The work/life collision: what work is doing to Australians and what to do about it*. Sydney, The Federation Press.
- Pocock, B., J. Elton, A. Preston, S. Charlesworth, F. MacDonald, M. Baird, R. Cooper and B. Ellem (2008). "The impact of 'work choices' on women in low paid employment in Australia: a qualitative analysis." *Journal of Industrial Relations* 50(3): 475–488.
- Pocock, B., N. Skinner and R. Ichii (2009). *Work, Life and Workplace Flexibility: The Australian Work and Life Index 2009*. Adelaide, the Centre for Work + Life, University of South Australia
- Pocock, B., N. Skinner and P. Williams (2007a). *Work–life in Australia: Outcomes from the Australian Work and Life Index (AWALI) 2007*. Adelaide, the Centre for Work + Life, University of South Australia.
- Pocock, B., N. Skinner and P. Williams (2007b). *Work, Life and Time: Australian Work and Life Index 2007*. Adelaide, the Centre for Work + Life, University of South Australia.
- Pocock, B., N. Skinner and P. Williams (2008b). "Measuring work–life interaction: The Australian Work and Life Index (AWALI) 2007." *Labour & Industry* 18(3): 19-43.
- Pocock, M., D. Trivedi, W. Wills, F. Bunn and J. Magnusson (2010). "Parental perceptions regarding healthy behaviours for preventing overweight and obesity in young children: a systematic review of qualitative studies." *Obesity Reviews* 11(5): 338-353.

- Power, C., J. K. Lake and T. J. Cole (1997). "Review: measurement and long-term health risks of child and adolescent fatness." *International Journal of Obesity & Related Metabolic Disorders* 21(7): 507.
- Prusank, D. T. (2007). "The introduction of communication into popular parenting advice: an analysis of Hiam Ginott's "Between parent and child"." *Review of Communication* 7(4): 338-351.
- Pugh, A. (2002). *From compensation to childhood-wonder: Why parents buy*. Working paper no. 39 May. Berkeley, Center for Working Families, University of California.
- Puhl, R. M., C. A. Heuer and K. D. Brownell (2010). *Stigma and Social Consequences of Obesity. Clinical Obesity in Adults and Children, Third Edition*. P. G. Kopelman, I. D. Caterson, W. H. Dietz. Oxford, Wiley-Blackwell.
- Purdy, L. M. (1992). *Liberated children. In their best interest?: The case against equal rights for children*. New York, Cornell University Press.
- Pyke, K. D. (1996). "Class-based masculinities: the interdependence of gender, class, and interpersonal power." *Gender and Society* 10(5): 527-549.
- Quirke, L. (2006). "'Keeping young minds sharp': children's cognitive stimulation and the rise of parenting magazines, 1959–2003." *Canadian Review of Sociology* 43(4): 387-406.
- Rao, R. S., M. E. Glickman and R. J. Glynn (2008). "Stopping rules for surveys with multiple waves of nonrespondent follow-up." *Statistics in Medicine* 27(12): 2196-2213.
- Reilly, J. J., and J. Kelly (2010). "Long-term impact of overweight and obesity in childhood and adolescence on morbidity and premature mortality in adulthood: systematic review." *International Journal of Obesity* 35(7):891-898.
- Ridgeway, C. L. and S. J. Correll (2004). "Motherhood as a status characteristic." *Journal of Social Issues* 60(4): 683-700.
- Ritchie, J. (2002). "Parents: discipline, punishment and child abuse: a four decade study of child rearing attitudes and practices." *The Bulletin* 100: 30-33.
- Rizzo, K., H. Schiffrin and M. Liss (2012). "Insight into the parenthood paradox: mental health outcomes of intensive mothering." *Journal of Child and Family Studies*: 1-7.
- Robinson, J. (2002). "An introduction to the international law on the rights of the child relating to the parent-child relationship." *Stellenbosch Law Review* 13: 309-320.
- Rokholm, B., J. L. Baker, and T. I. A. Sørensen. (2010) "The levelling off of the obesity epidemic since the year 1999—a review of evidence and perspectives." *Obesity Reviews* 11(12):835-846.
- Rosenkranz, R. R. and D. A. Dzewaltowski (2008). "Model of the home food environment pertaining to childhood obesity." *Nutrition Reviews* 66(3): 123-140.
- Ruhm, C. J. (2004). "Parental employment and child cognitive development." *The Journal of Human Resources* 39(1): 155-192.
- Ruhm, C. J. (2008). "Maternal employment and adolescent development." *Labour Economics* 15(5): 958–983.

- Russell, G. (1999). *Fitting fathers into families: men and the fatherhood role in contemporary Australia*. Canberra, Department of Family and Community Services.
- Salmon, J., A. Timperio, V. Cleland and A. Venn (2005). "Trends in children's physical activity and weight status in high and low socio-economic status areas of Melbourne, Victoria, 1985–2001." *Australian and New Zealand Journal of Public Health* 29(4): 337-342.
- Sanigorski, A., A. Bell, P. Kremer and B. Swinburn (2007). "High childhood obesity in an Australian population." *Obesity* 15(8): 1908-1912.
- Sargent, J. D. and D. G. Blanchflower (1994). "Obesity and stature in adolescence and earnings in young adulthood: analysis of a British birth cohort." *The Archives of Pediatrics & Adolescent Medicine* 148(7): 681-687.
- Sarkadi, A., R. Kristiansson, F. Oberklaid and S. Bremberg (2008). "Fathers' involvement and children's developmental outcomes: a systematic review of longitudinal studies." *Acta Pædiatrica* 97(2): 153-158.
- Savage, J. S., J. O. Fisher and L. L. Birch (2007). "Parental influence on eating behavior: conception to adolescence." *The Journal of Law, Medicine & Ethics* 35(1): 22-34.
- Saxton, J., S. Carnell, C. H. M. van Jaarsveld and J. Wardle (2009). "Maternal education is associated with feeding style." *Journal of the American Dietetic Association* 109(5): 894-898.
- Sayer, L. C., P. England, M. Bittman and S. M. Bianchi (2009). "How long is the second (plus first) shift? gender differences in paid, unpaid, and total work time in Australia and the United States." *Journal of Comparative Family Studies* 40(4): 523-545.
- Schafer, A. (2009). *Honey, I Wrecked the Kids: When Yelling, Screaming, Threats, Bribes, Time-outs, Sticker Charts and Removing Privileges All Don't Work*. Mississauga, John Wiley & Sons Canada, Ltd.
- Schoeman, F. (1980). "Rights of children, rights of parents, and the moral basis of the family." *Ethics* 91(1): 6-19.
- Schön, R. A. (2007). "Natural parenting — back to basics in infant care." *Evolutionary Psychology* 5(1): 102-183.
- Scott, S. (2010). "National dissemination of effective parenting programmes to improve child outcomes." *The British Journal of Psychiatry* 196(1): 1-3.
- Shavers, V. L. (2007). "Measurement of socioeconomic status in health disparities research." *Journal of the National Medical Association* 99(9): 1013-1023.
- Sherry, B., J. Mcdivitt, L. L. Birch, F. H. Cook, S. Sanders, J. L. Prish, L. A. Francis and K. S. Scanlon (2004). "Attitudes, practices, and concerns about child feeding and child weight status among socioeconomically diverse white, Hispanic, and African-American mothers." *Journal of the American Dietetic Association* 104(2): 215-221.
- Sheskin, D. (2007). *The Handbook of Parametric and Nonparametric Statistical Procedures*. Florida, Chapman & Hall/CRC.
- Shrewsbury, V. and J. Wardle (2008). "Socioeconomic status and adiposity in childhood: a systematic review of cross-sectional studies 1990–2005." *Obesity* 16(2): 275-284.

- Singer-Vine, J. (2009). Beyond BMI: why doctors won't stop using an outdated measure for obesity. Retrieved 23 May, 2010, from [http://www.slate.com/articles/health\\_and\\_science/science/2009/07/beyond\\_bmi.html](http://www.slate.com/articles/health_and_science/science/2009/07/beyond_bmi.html)
- Skinner, N., S. Parvazian and J. Dorrian (2010). *FLAWS in our lives: Fatigue, Work and Life Strain*. Adelaide, The Centre for Work + Life, University of South Australia.
- Skinner, N. and S. Pisaniello (2010). *Juggling Work Life Balance in South Australia*. Adelaide, the Centre for Work + Life, University of South Australia.
- Skinner, N. and B. Pocock (2008b). *Work, life and workplace culture: The Australian Work and Life Index 2008*. Adelaide, the Centre for Work + Life, University of South Australia.
- Skouteris, H., M. McCabe, L. A. Ricciardelli, J. Milgrom, L. A. Baur, N. Aksan and D. Dell'Aquila (2012). "Parent-child interactions and obesity prevention: a systematic review of the literature." *Early child development and care* 182(2):153-174.
- Slater, J., G. Sevenhuysen, B. Edginton and J. O'neil (2012). " 'Trying to make it all come together': structuration and employed mothers' experience of family food provisioning in Canada." *Health Promotion International* 27(3): 405-415.
- Sleddens, E. F., S. M. Gerards, C. Thijs, N. K. de Vries and S. P. J. Kremers (2011). "General parenting, childhood overweight and obesity-inducing behaviors: A review." *International Journal of Pediatric Obesity* 6(2Part2): e12-e27.
- Snedecor, G. W. and W. G. Cochran (1989). *Statistic methods*. Ames, Iowa, Iowa State University Press.
- Sobal, J. and A. Stunkard (1989). "Socioeconomic status and obesity: a review of the literature." *Psychological Bulletin* 105(2): 260-275.
- Southerton, D. (2003). "'Squeezing time'." *Time & Society* 12(1): 5-25.
- Southerton, D. (2007). "Time pressure, technology and gender: the conditioning of temporal experiences in the UK." *Equal Opportunities International* 26(2): 113-128.
- Spock, B. (1969). *Baby and Child Care*. London, The Bodley Head Ltd.
- Stamatakis, E., J. Wardle and T. J. Cole (2010). "Childhood obesity and overweight prevalence trends in England: evidence for growing socioeconomic disparities." *International Journal of Obesity* 34:41-47
- Stang, A. and K.-H. Jöckel (2004). "Studies with low response proportions may be less biased than studies with high response proportions." *American Journal of Epidemiology* 159(2): 204-210.
- Stapleton, H. and J. Keenan (2009). *(New) Family Formation and the Organisation of Food in Households: Who Does What and Why? Changing Families, Changing Food*. P. Jackson. Hampshire, Palgrave Macmillan.
- StataCorp LP (2007). *Stata Statistical Software: Release 10*, College Station, TX: StataCorp LP.
- Stearns, P. N. (2003). *Anxious parents: a history of modern child-rearing in America*. New York, New York University Press.

- Strazdins, L., M. S. Clements, R. J. Korda, D. H. Broom and R. M. D'Souza (2006). "Unsociable work? nonstandard work schedules, family relationships, and children's well-being." *Journal of Marriage and Family* 68(2): 394-410.
- Strazdins, L., R. Korda, L. Lim, D. Broom and R. D'Souza (2004). "Around-the-clock: parent work schedules and children's well-being in a 24-h economy." *Social Science and Medicine* 59: 1517-1527.
- Strazdins, L. and B. Loughrey (2007). "Too busy: why time is a health and environmental problem." *NSW Public Health Bulletin* 18(11-12): 219-221.
- Strazdins, L., M. Shipley, M. Clements, L. V. Obrien and D. H. Broom (2010). "Job quality and inequality: Parents' jobs and children's emotional and behavioural difficulties." *Social Science & Medicine* 70(12): 2052-2060.
- Sullivan, O., S. Coltrane, L. McAnnally and E. Altintas (2009). "Father-friendly policies and time-use data in a cross-national context: potential and prospects for future research." *The ANNALS of the American Academy of Political and Social Science* 624(1): 234-254.
- Summers, A. (2003). *End of Equality: Work, Babies and Women's Choices in the 21st Century*. Sydney, Random House.
- Sunderland, J. (2006). "'Parenting' or 'mothering'? The case of modern childcare magazines." *Discourse & Society* 17(4): 503-528.
- Sutherland, J.-A. (2010). "Mothering, guilt and shame." *Sociology Compass* 4(5): 310-321.
- Synnott, A. (2006). *Little Angels, Little Devils: A Sociology of Children*. Childhood Socialisation 2nd Edition. G. Handel. Piscataway, Rutgers.
- Tabachnik, B., L. Fidell and S. Osterlind (2001). *Using Multivariate Statistics* 4th Edition. Ma, Allyn & Bacon.
- Takahashi, E., K. Yoshida, H. Sugimori, M. Miyakawa, T. Izuno, T. Yamagami and S. Kagamimori (1999). "Influence factors on the development of obesity in 3-year-old children based on the Toyama study." *Preventive Medicine* 28(3): 293-296.
- Tharenou, P. (2012). "The work of feminists is not yet done: the gender pay gap—a stubborn anachronism." *Sex Roles*.
- Thompson, L. and A. J. Walker (1989). "Gender in families: women and men in marriage, work, and parenthood." *Journal of Marriage and Family* 51(4): 845-871.
- Thompson, M. J. J., A. Raynor, D. Cornah, J. Stevenson and E. J. S. Sonuga-Barke (2002). "Parenting behaviour described by mothers in a general population sample." *Child: Care, Health & Development* 28(2): 149-155.
- Thurer, S. (1995). *Myths of motherhood: how culture reinvents the good mother*. Ringwood, Victoria, Penguin Books.
- Timperio, A., J. Salmon, A. Telford and D. Crawford (2005). "Perceptions of local neighbourhood environments and their relationship to childhood overweight and obesity." *International Journal of Obesity* 29: 170-175.

- Todd, P. and J. Binns (2011). "Work–life balance: is it now a problem for management?" *Gender, Work & Organization*.
- Townsend, P., N. Davidson and M. Whitehead (1988). *Inequalities in health: the Black report and the health divide*. Harmondsworth, Penguin.
- Turner, J., J. Kelly and K. McKenna (2006). "Food for thought: parents' perspectives of child influence." *British Food Journal* 108(3): 181-191.
- Ulker, A. (2006). "Non-standard work schedules and health outcomes in Australia: some evidence from the HILDA panel." *Australian Journal of Labour Economics* 9(4): 417-445.
- Valentine, G. (1997). "'Oh yes I can.' 'oh no you can't': children and parents' understandings of kids' competence to negotiate public space safely." *Antipode* 29(1): 65-89.
- Valentine, G. (1997a). "'My son's a bit dizzy', 'my wife's a bit soft': gender, children and cultures of parenting." *Gender, Place & Culture* 4(1): 37-62.
- van Wanrooy, B. and S. Wilson (2006). "Convincing the toilers?: Dilemmas of long working hours in Australia" *Work, Employment & Society* 20(2): 349-368.
- Vander Ven, T. M., F. T. Cullen, M. A. Carrozza and J. P. Wright (2001). "Home alone: the impact of maternal employment on delinquency." *Social Problems* 48(2): 236-257.
- Varuhas, J., L. Fursman and V. Jacobsen (2003). *Work and Family Balance: An Economic View: New Zealand Treasury Working Paper 03/26*. Wellington, New Zealand Treasury.
- Ventura, A. and L. Birch (2008). "Does parenting affect children's eating and weight status?" *International Journal of Behavioral Nutrition and Physical Activity* 5(1): 15.
- Vidmar, S., J. Carlin, K. Hesketh and T. Cole (2004). "Standardizing anthropometric measures in children and adolescents with new functions for egen." *The Stata Journal* 4(1): 50-55.
- Vincent, C., S. J. Ball and S. Pietikainen (2004). "Metropolitan mothers: mothers, mothering and paid work." *Women's Studies International Forum* 27(5-6): 571-587.
- Viner, R. M. and T. J. Cole (2005). "Adult socioeconomic, educational, social, and psychological outcomes of childhood obesity: a national birth cohort study." *British Medical Journal* 330(7504): 1354.
- Vinkenburg, C. J., M. L. van Engen, A. H. Eagly and M. C. Johannesen-Schmidt (2011). "An exploration of stereotypical beliefs about leadership styles: is transformational leadership a route to women's promotion?" *The Leadership Quarterly* 22(1): 10-21.
- Voigt, L. F., T. D. Koepsell and J. R. Daling (2003). "characteristics of telephone survey respondents according to willingness to participate." *American Journal of Epidemiology* 157(1): 66-73.
- von Rueden, U., A. Gosch, L. Rajmil, C. Bisegger, U. Ravens-Sieberer and K. g. the European (2006). "Socioeconomic determinants of health related quality of life in childhood and adolescence: results from a European study." *Journal of Epidemiology and Community Health* 60(2): 130-135.

- Wajcman, J. (2008). "Life in the fast lane? Towards a sociology of technology and time." *The British Journal of Sociology* 59(1): 59-77.
- Wake, M., L. Canterford, G. C. Patton, K. Hesketh, P. Hardy, J. Williams, E. Waters and J. B. Carlin (2010). "Comorbidities of overweight/obesity experienced in adolescence: longitudinal study." *Archives of Disease in Childhood* 95(3): 162-168.
- Wake, M., P. Hardy, L. Canterford, M. Sawyer and J. Carlin (2007a). "Overweight, obesity and girth of Australian preschoolers: prevalence and socio-economic correlates." *International Journal of Obesity* 31: 1044–1051.
- Walker, L. M. (1997). "Chivalrous masculinity among juvenile offenders in western sydney: a new perspective on young working class men and crime." *Current issues in criminal justice* 9(3): 279-293.
- Walker, R. and J. Hiller (2005). "The Index of Relative Socio-economic Disadvantage: general population views on indicators used to determine area-based disadvantage." *Australian and New Zealand Journal of Public Health* 29(5): 442 - 447.
- Wall, G. (2010). "Mothers' experiences with intensive parenting and brain development discourse." *Women's Studies International Forum* 33(3): 253-263.
- Wall, G. and S. Arnold (2007). "How involved is involved fathering?: An exploration of the contemporary culture of fatherhood." *Gender & Society* 21(4): 508-527.
- Wallace, M. (2000). "Workplace training initiatives: implications for women in the Australian workforce." *Journal of European Industrial Training* 24(5): 268-274.
- Walsh, J. (2007). "Experiencing part-time work: temporal tensions, social relations and the work-family interface." *British Journal of Industrial Relations* 45(1): 155–177.
- Wang, Z., C. M. Patterson and A. P. Hills (2002). "Association between overweight or obesity and household income and parental body mass index in Australian youth: analysis of the Australian National Nutrition Survey, 1995." *Asia Pacific Journal of Clinical Nutrition* 11(3): 200-205.
- Warren, J. R., P. Hoonakker, P. Carayon and J. Brand (2004). "Job characteristics as mediators in SES-health relationships." *Social Science & Medicine* 59(7): 1367-1378.
- Warren, T. (2003). "Class and gender-based working time? time poverty and the division of domestic labour." *Sociology* 37(4): 733.
- Watson, L. (2007). Marketing. The Annual Conference of the Administrative Sciences Association of Canada Marketing Division, Ottawa, Ontario, York University.
- Watson, N. and M. Wooden (2009). Identifying Factors Affecting Longitudinal Survey Response. Methodology of longitudinal surveys. P. Lynn. West Sussex, John Wiley & Sons Ltd.
- Webber, G. and C. Williams (2008). "Part-time work and the gender division of labor." *Qualitative Sociology* 31(1): 15-36.
- West, C. and D. H. Zimmerman (1987). "Doing gender." *Gender and Society* 1(2): 125-151.
- Whelehan, I. (1995). Modern feminist thought: from the second wave to "post-feminism". Edinburgh, Edinburgh University Press Ltd. .

- Whitaker, R. C., M. S. Pepe, J. A. Wright, K. D. Seidel and W. H. Dietz (1998). "Early adiposity rebound and the risk of adult obesity." *Pediatrics* 101(3): e5-e5.
- White, N. (1994). "About fathers: masculinity and the social construction of fatherhood." *The Australian and New Zealand journal of sociology* 30(2): 119-131.
- Whitehead, S. M. and F. J. Barrett (2001). *The Sociology of Masculinity. The masculinities reader*. S. M. Whitehead and F. J. Barrett. Cambridge, Polity Press.
- Widhalm, K., K. Schönegger, C. Huemer and A. Auterith (2001). "Does the BMI reflect body fat in obese children and adolescents? A study using the TOBEC method." *International Journal of Obesity* 25(2): 279-285.
- Williams, J., M. Wake, K. Hesketh, E. Maher and E. Waters (2005). "Health-related quality of life of overweight and obese children." *The Journal of the American Medical Association* 293(1): 70-76.
- Williams, P., B. Pocock and N. Skinner (2008). "'Clawing back time': expansive working time and implications for work-life outcomes in Australian workers." *Work Employment Society* 22(4): 737-748.
- Williams, W. W. (1997). *The Equality Crisis: Some Reflections on Culture, Courts, and Feminism. The second wave: a reader in feminist theory*. L. J. Nicholson. London, Routledge.
- Wilson, A. (1980). "The infancy of the history of childhood: an appraisal of Philippe Ariès." *History and Theory* 19(2): 132-153.
- Wilson, J. (1991). "Power, paranoia, and education." *Interchange* 22(3): 43-54.
- Winkleby, M. A., D. E. Jatulis, E. Frank and S. P. Fortmann (1992). "Socioeconomic status and health: how education, income, and occupation contribute to risk factors for cardiovascular disease." *American journal of public health* 82(6): 816-820.
- Woodhouse, B. B. (1994). "Out of children's needs, children's rights: the child's voice in defining the family." *Brigham Young University Journal of Public Law* 8(2): 321-342.
- Woodward, L. J., D. M. Fergusson, A. Chesney and L. J. Horwood (2007). "Punitive parenting practices of contemporary young parents." *The New Zealand Medical Journal* 120(1267).
- World Health Organization (1995). *Physical status: the use and interpretation of anthropometry*. WHO Technical Report Series 854. Geneva, World Health Organization.
- World Health Organization (2000). *Obesity: preventing and managing the global epidemic*. WHO Obesity Technical Report Series 894. Geneva, World Health Organization.
- World Health Organization (2006). *Obesity and overweight: What are overweight and obesity? Fact sheet N°311*, World Health Organization.
- Wyness, M. G. (1994). "Keeping tabs on an uncivil society: positive parental control." *Sociology* 28(1): 193-209.
- Yen, I. H. and S. L. Syme. (1999) "The social environment and health: a discussion of the epidemiologic literature." *Annual review of public health* 20(1): 287-308.

Yeung, W. J., J. F. Sandberg, P. E. Davis-Kean and S. L. Hofferth (2001). "Children's time with fathers in intact families." *Journal of Marriage and Family* 63(1): 136-154.

Yoshida, A. (2012). "Dads who do diapers." *Journal of Family Issues* 33(4): 451-477.

Zelizer, V. (2001). *Pricing the Priceless Child. Self and Society*. A. Branaman. Massachusetts, Blackwell Publishers Ltd.

Zeller, M. H., J. Reiter-Purtill and C. Ramey (2008). "Negative peer perceptions of obese children in the classroom environment." *Obesity* 16(4): 755-762.

Zervides, S. and A. Knowles (2007). "Generational changes in parenting styles and the effect of culture." *E-Journal of Applied Psychology* 3(1): 65-75.

Zhu, A. (2007). *The Effect of Maternal Employment on the Likelihood of a Child Being Overweight: School of Economics Discussion Paper: 2007/17*. Sydney, School of Economics, University of New South Wales.

Zuo, Y., M. Norberg, L. M. Wen and C. Rissel (2006). "Estimates of overweight and obesity among samples of preschool-aged children in Melbourne and Sydney." *Nutrition & Dietetics* 63(3): 179-182.