UNDERSTANDING OBESITY:

PSYCHOLOGICAL CUES AND ANTECEDENTS OF EATING BEHAVIOUR

By

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ABSTRACT

Obesity has been described by the World Health Organisation as a global epidemic, and is perceived as a major health concern due to the associated medical, psychosocial, and economic problems. One approach of understanding obesity is directed towards exploring the psychological and social determinants underlying non-hungry eating (NHE) (eating without physical sensations associated with hunger) and overeating (eating past the physiological sensations of fullness). The immediate psychosocial cues that trigger NHE and overeating, along with the psychosocial antecedents that influence NHE and overeating have been found to be important contributors to obesity.

This research incorporated two studies. Study 1 involved self-report questionnaires comparing the antecedents and cues that influence NHE and overeating among men and women who were obese, overweight, and of a healthy weight (HWR). Study 2 adopted a case study approach to explore individual antecedents and triggers of NHE and overeating among three obese participants.

Findings indicated that HWR, overweight, and obese people differed in the antecedents and cues that influenced their eating behaviours, which were particularly borne out in quantitative data. In addition, females and males differed in their reported antecedents and cues. For example, across all three weight groups, more females than males were restricting their food intake in attempt to lose weight, which can result in future NHE and overeating. In addition, overweight females reported the highest levels of non-hungry eating, emotional eating and external eating, compared to all other groups. Males of a healthy weight reported the lowest amounts of both NHE and restrained eating of the six groups (crossing 2 x gender and 3 x weight groups). Interestingly, eating in response to external cues was least common in overweight

males. Compared to the other weight groups, more overweight participants reported they ate quickly and at predetermined times, and that food had been used as a reward or to soothe pain throughout childhood. Overweight participants ate more frequently in response to positive emotions and experienced more negative emotions after overeating than healthy weight or obese participants.

Although distinct patterns of eating behaviour were observed for males and females within the separate weight categories, variability was also evident within the groups, suggesting that despite having similar body mass indexes, antecedents and cues that maintain individuals' weights vary.

Results of the qualitative study also highlight the diverse cues and antecedents that can contribute to an individual becoming and maintaining an obese weight. What is clear from both studies is that no one eating pattern typifies a particular weight group, in the case of healthy, overweight, or obese individuals. In addition, people who are overweight need to become a priority for obesity research, in order to increase the understanding of the psychology of why and how people transgress from an overweight to an obese BMI or from an obese to an overweight BMI. This research highlight the diversity in antecedents and triggers that may contribute to a person becoming overweight or obese, and suggests these individual differences be recognised for successful weight loss treatment.

DECLARATION

I, Michelle Cranston, declare that the Doctor of Applied Psychology (Sport Psychology) thesis entitled “Understanding obesity: Psychological cues and antecedents of eating behaviour” is no more than 40,000 words in length, exclusive of tables, figures, appendices, references, and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree of diploma. Except where otherwise indicated, this thesis is my own work.

Signature: Date:

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Completing this research has been a journey. Although some of them would not realise, many colleagues, friends and family joined me on this journey and made it a whole lot easier. They walked with me, stumbled with me, sat with me, and, at times, even picked me up and dragged me (often kicking and screaming!). I would like to take this opportunity to thank all my travelling companions.

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CHAPTER 1

INTRODUCTION

"I am astonished at how I have allowed my significant weight gain to diminish me as a person. I thought I was an intelligent, modern, enlightened woman, and yet I have become apologetic for my weight, like I am a pariah or something. It has been a real shock."

Participant, Study 1

Obesity has reached epidemic proportions worldwide (World Health Organisation, 2006). Within Australia, 62% of adults are classified as either overweight or obese (Australian Bureau of Statistics, 2009). Particularly alarming is the increasing rate of obesity among children. Obesity is associated with more than 30 debilitating and life threatening medical conditions (American Obesity Association, 2002) and various psychosocial problems, which together reduce overall quality of life (Han, Tijhuis, Lean, & Seidell, 1998).

Body weight is determined by energy intake relative to energy expenditure. Multiple biological mechanisms act to regulate this equation so a stable weight is maintained. Obesity and overweight is the result of positive energy overload, where energy intake exceeds energy expenditure over a sustained period as a consequence of the influences of genetic, environmental, social, and psychological factors on either side of the equation.

The focus of this research is directed towards the energy intake side of the energy balance equation, in particular, the psychological and social factors that determine and modify food intake. Both non-hungry eating (NHE) (eating without

physical sensations associated with hunger) and overeating (eating past the physiological sensations associated with fullness) are thought to be the main contributors to the energy overload required to cause obesity. Specifically, this research explores the role of psychological and social antecedents that influence NHE and overeating, along with the immediate psychological and social cues that trigger NHE and overeating.

The research comprises two studies that aim to explore and compare the antecedents and cues that trigger NHE and overeating among healthy weight (BMI = 18.5-24.9 kg/m^2), overweight (BMI = 25-29.9), and obese (BMI $\geq$ 30) males and females. These BMI categories are specific to adults and are determined by the World Health Organisation (2000b) based on the severity of associated health risks of excess weight. The research also aims to provide a personal, in-depth account of the various antecedents and cues that trigger NHE and overeating, specifically among people with obesity.

Study 1 uses a quantitative approach to investigate differences in antecedents and cues between healthy weight, overweight, and obese participants. Specifically, internal and external cues, restrained eating, and other antecedents of NHE and overeating are explored and compared across the three weight groups. Gender differences in prevalence and reasons underlying NHE and overeating are also explored and compared.

Study 2 presents three in-depth case studies to highlight the importance of recognising the individual antecedents and triggers among obese people. Although all three participants have an obese BMI classification, each participant's story is unique, incorporating different antecedents, triggers, and eating styles that have contributed to becoming and maintaining an obese weight.

Although many similarities were found between each of the weight and gender groups, there was considerable variation within each group. Findings highlight that eating behaviour, along with the cues and antecedents that can influence food intake, are unique for each individual, irrespective of weight or gender. Another important finding of this research is that people who are overweight have very different eating behaviours compared with people who are in the higher and lower BMI categories. Overweight people are often neglected in obesity research, however, through the findings of this study, it is clear that this subgroup may contribute to the understanding of the psychological process of transgressing up from an overweight to an obese BMI or transgressing down from an obese to an overweight BMI. This understanding will assist in the development of weight loss interventions which have previously failed to contain the rapidly increasing obesity rate worldwide.

CHAPTER 2

LITERATURE REVIEW

The Problem of Obesity

Epidemiology of Obesity

Obesity has been described by the World Health Organisation (WHO) as "a global epidemic" with an estimated 1.6 billion adults worldwide being overweight, 400 million of whom are clinically obese (World Health Organisation [WHO], 2006). Obesity is a worldwide problem that affects most, if not all, countries and is particularly prevalent in Western societies (Department of Health and Ageing, 2003). Paradoxically, in many developing countries, overweight and obesity co-exist with under-nutrition (Department of Health and Ageing, 2003).

The results of an Australian National Health Survey conducted during 2007 and 2008 (Australian Bureau of Statistics [ABS], 2009) revealed that Australia has one of the highest incidences of obesity in the world, with approximately 25% of the adult population classified as obese and a further 37% classified as overweight. Although the proportions of males and females with obesity are similar (26% and 24% respectively), significantly more males than females (42% and 31% respectively) are overweight. The results of the Australian National Health Survey also indicated that many Australians whose weight is above a healthy weight range do not perceive themselves to be overweight or obese and therefore may not be aware of their increased health risk or the need for weight loss. Self-reported data from the survey indicates that 63% of males and 48% of females were overweight or obese, however, based on actual measurements conducted in conjunction with the survey, 68% of males and 55% of females were overweight or obese.

Although overweight and obesity are prevalent across most demographic divisions and geographic regions in Australia, several groups appear to be more at risk. According to the ABS (2001), the incidence of obesity in Australia is greatest among Indigenous Australians living in non-remote areas (e.g., city and populated rural locations) (31%), people in the most disadvantaged socio-economic groups (21%), and low income earners (19%). More recent research (Wake, Hardy, Canterfold, Sawyer, & Carlin, 2007) has found these patterns also to be evident among preschool children. In a study of a nationally-representative sample of 4983 four and five year-old children, findings indicated that children who spoke a language other than English, were of Indigenous status, or were in the lowest socio-economic quintile were most likely to be in the heavier BMI categories. Children in the lowest socio-economic quintile had 47% higher odds of being in a heavier body mass index category compared to children in the highest socio-economic quintile.

Particularly alarming are the high levels of overweight and obesity among children. In Australia, between 1985 and 1995 the level of obesity in children tripled (Department of Health and Ageing, 2003). In 2008, an estimated 25% of Australians under the age of 18 years were either overweight or obese, an increase of 4% since 1995 (ABS, 2009). These statistics suggest that although the levels of overweight and obesity are increasing among children, the rate that overweight and obesity levels are increasing may be slowing. Overweight and obesity among children are of particular concern, not only because of the immediate health and social problems, but also because overweight children have an increased risk of later becoming overweight or obese adults (Department of Health and Ageing, 2003; Reilly, 2007).

Costs of Obesity

Obesity is a major health concern because of the associated medical, psychosocial, and economic problems. Obesity and overweight are risk factors associated with more than 30 debilitating and life threatening medical conditions including cardiovascular disease, type 2 diabetes, stroke, many forms of cancer, osteoarthritis, kidney and gallbladder diseases, and respiratory and musculoskeletal problems (American Obesity Association, 2002). In Australia, overweight and obesity account for approximately 4.3% of all Disability Adjusted Life Years (a DALY is a year of healthy life lost from mortality or disability) (Mathers, Vos, & Stevenson, 1999). Furthermore, obesity is related to psychosocial problems such as depression, body image disturbances, disordered eating behaviours such as binge eating and night eating, low self-esteem, and poor coping skills (for a summary of the psychological effects of obesity, see Brownell & Fairburn, 1995; de Zwaan, Burgard, Schenck, & Mitchell, 2003). Social discrimination towards people with obesity is also common, and adds to an overall reduction in the quality of life of people who are over a socially acceptable weight (Han et al., 1998). Stigmatisation of obese people not only affects psychological wellbeing but also threatens health, generates health disparities, and interferes with effective obesity intervention efforts (Puhl & Heuer, 2010).

The associated health problems associated with overweight and obesity place a significant financial burden on health systems. The World Health Organisation (2000a) estimated that in some developed countries obesity accounts for between 2 - 7% of the total health care costs of the country. Within Australia the total financial cost of obesity in 2008 was estimated to be over $8.28 billion, incorporating costs such as lost productivity ($3.6 billon), health system costs ($2 billion), and carer costs ($1.9 billion) (Access Economics, 2008). In addition to the direct costs of obesity,

indirect costs (e.g., loss of wages) and personal costs (e.g., money spent on commercial weight loss programs, weight loss surgery) are also substantial. Throughout 2008, in Australia, the estimated net cost of lost wellbeing associated with obesity was valued at $32.7 billion, bringing to total cost of obesity in 2008 to a staggering $41 billion (Access Economics, 2008).

Measures of Obesity

Obesity and overweight are most commonly identified by the body mass index (BMI), defined as a ratio of a person's weight in kilograms to height in metres squared (kg/m^2) (WHO, 2000b). Typically, BMIs within the range 18.5 to 24.9 are considered healthy. A person who has a BMI under 18.5 is considered underweight. Overweight (sometimes termed 'pre-obesity') is defined as a BMI between 25 and 29.9 and obesity as 30 and higher. Obesity is further categorised into three levels relating to the severity of associated health risks. Class I obesity refers to a BMI range between 30 and 34.9, where the associated health risks are moderate compared to the healthy weight range. Class II obesity refers to a BMI range of between 35 and 39.9 and is associated with severe health risks, while class III obesity refers to a BMI of 40 or higher, and is sometimes termed "morbid obesity" because of the associated extremely severe health risks.

Although the World Health Organisation has identified the above categories based on the severity of associated health risks of excess weight, these categories are not suitable for certain sub-populations such as children and different cultural groups (Deurenberg-Yap, Chew, & Deurenberg, 2002). For example, increased risks of developing cardiovascular disease and diabetes are associated with a much lower BMI (23 kg/m^2) in Asian populations compared to European populations (Deurenberg-Yap et al., 2002). In addition, due to unique body proportions, a healthy BMI for

Indigenous Australians appears to be between 17 and 22, as metabolic complications develop rapidly as BMI increases above 22 kg/m^2 within this sub-population (Norgan & Jones, 1995).

BMI measurements can also be a misleading estimation of body fat, particularly in lean athletic body types, since it incorporates only measures of height and weight, and may therefore not accurately assess body fat composition. Other measures used to determine overweight and obesity include the ratio of waist to hip circumference and skinfold measurements (Warden, 1996). The BMI, however, is the measure that is most commonly used by both researchers and practitioners and has been adopted by the WHO to define healthy and unhealthy weight ranges. BMI is also convenient and readily accessible for self-report data collection methods.

Causes of Overweight and Obesity

In simple terms, obesity is the result of an energy imbalance where energy intake exceeds energy expenditure over a prolonged period. According to the energy balance equation, changes in energy stores = energy intake – energy expenditure (WHO, 2000c). Energy intake refers to the number of kilojoules consumed, whereas energy expenditure refers to the total number of kilojoules used by the body for daily living (e.g., maintaining body temperature, cardiac and respiratory muscle activity) and physical activity.

Various physiological mechanisms act to stabilise body weight following day-to-day fluctuations (e.g., after meals) (Shutz, 1995). This equilibrium is often termed the “static phase” when energy intake and energy expenditure are balanced. When energy intake exceeds energy expenditure over a prolonged period, however, these physiological mechanisms that act to stabilise weight are overwhelmed and can no longer compensate for the energy overload. A gradual increase in body weight occurs,

which is often termed the “dynamic phase”. During this phase, the size of the energy imbalance progressively diminishes as weight is gained, due to increased metabolism associated with the larger volume of adipose tissue and fat-free mass. Eventually a higher equilibrium weight is established, which again is regulated by physiological mechanisms, and the individual returns to a static phase but at a heavier weight.

Genetic, biological, environmental, social, and psychological factors influence both sides of the energy balance equation, predisposing people to become overweight and obese. Findings from epidemiological, genetic, and molecular studies have suggested that biological and genetic factors can predispose a person to be more susceptible to weight gain. For example, age, gender, ethnicity, hormonal factors, and a wide range of genetic influences have been found to influence body weight (Katahn & McMinn, 1990). Although a person may have a greater biological or genetic predisposition to weight gain than another, additional environmental, social, or psychological factors must occur to cause an energy overload for weight gain to develop.

Environmental and cultural factors play a significant role in the development of overweight and obesity by indirectly (and sometimes directly) encouraging overeating and inactivity (Ferro-Luzzi & Martino, 1996). Large-scale environmental and cultural changes inherent in the modernisation of society have contributed to obesity by influencing both sides of the energy balance equation. For example, the increased use of cars and labour-saving devices, along with the increased popularity of more passive forms of entertainment such as television, computers, and video games have reduced incidental and purposeful physical activity. In addition, the extensive availability of high kilojoule ‘fast foods’ and drinks, and larger portion sizes are contributing to excessive food intake (WHO, 2000c).

Other factors that have been found to influence both sides of the energy balance equation, include the psychological and social influences concerning why people do and do not engage in physical activity and the reasons underlying why people eat. In relation to physical activity, Noland and Feldmen's (1984) Exercise Behaviour Model (EBM) identifies variables that may influence exercise participation. The EBM is based on the popular Health Belief Model (Becker, 1974) which is a framework that suggests a person's predisposing factors (e.g., gender, age), in combination with modifying variables (e.g., perceived susceptibility, severity, and knowledge of the condition, self-efficacy, cues to exercise), influences their readiness to adopt a healthy behaviour. The likelihood of the person modifying their behaviour is determined by their readiness to change, along with their perceptions of the benefits and barriers to adopting the healthy behaviour.

The EBM suggests there are four major predispositions or inclinations that influence readiness to exercise. These include locus of control (perception that one's actions are determined by internal or external forces), attitude towards physical activity, individual self-concept, and one's physical fitness, appearance, and health values. These factors, in combination with perceived benefits and barriers to physical activity, determine the likelihood of a person engaging in regular physical activity.

The Transtheoretical Model (TTM) (Prochaska & DiClemente, 1983) has also contributed to the understanding of exercise behaviour. The model has been used to assess individuals' readiness to adopt a variety of healthy behaviours and provide strategies to guide individuals through the stages from pre-contemplating to maintaining these new behaviours.

The TTM of exercise behaviour is segregated into five stages based on intentions, behaviours, and one's readiness to exercise, and incorporates key factors

such as self-efficacy and perceived benefits and barriers to exercise. These factors change as people progress through each of the stages. The TTM has been used by health care professionals and researchers to develop interventions for exercise behaviour modification (Marshall et al., 2003; Napolitano et al., 2003; Williams et al., 2006).

In recent decades, much research has focused on the energy expenditure side of the equation (e.g., adherence to exercise programs, determinants of sedentary lifestyles). Nevertheless it is beyond the scope of this review to examine the energy expenditure side of the equation in great detail. For an excellent review of the adoption and maintenance of exercise behaviour, refer to Izawa, Oka, and Watanabe (2006).

Eating behaviour research that has targeted the other side of the energy balance equation (i.e., food intake) has focused on reasons underlying what and why people eat. In relation to obesity, this research has centred primarily on factors underlying non-hungry eating (NHE) (eating without the physiological sensations associated with hunger) and overeating (eating past the physiological sensations associated with satiety) on one hand, and dieting / weight management on the other. One component of eating behaviour research is directed towards understanding the psychological and social determinants underlying eating behaviour (Ogden, 2004). Psychological and social influences of food intake will be the focus of the remainder of the literature review and the overall focus of this current study. Specifically, the immediate psychological and social cues that trigger eating and the psychosocial antecedents that influence eating behaviour will be explored, along with the role of these factors in contributing to overweight and obesity.

Non-hungry Eating and Overeating in Obesity

The underlying common theme linking the biological, environmental, psychological, and social approaches to body weight is that obesity can only occur when energy intake remains higher than energy expenditure for an extended period of time (Jebb, 1999). For one to have a positive energy balance (energy intake greater than energy expenditure) one must have consumed more food than the body requires. Specifically, a certain amount of non-hungry eating (eating without feelings of physical hunger, as distinct from appetite-driven eating) and overeating must have occurred for an obese person to have initially gained (dynamic) and maintained (static) a weight that is above the healthy weight range. Furthermore, non-hungry eating and overeating consistently have been identified as being more prevalent among obese compared to non-obese people (Edelman, 1981; Hudson & Williams, 1981; Plutchik, 1976). For example, rather than relying predominantly on hunger signals to determine food intake, compared to people of a healthy weight, people with obesity are more likely to eat in response to emotions (Ganley, 1989), the time of day/passage of time (Schachter, 1971), habits (Schachter & Gross, 1968) and the hedonic qualities of food, such as appearance, taste, and smell (Nisbett, 1968).

Although non-hungry eating (NHE) and overeating are important factors in the development and maintenance of obesity as they both contribute significantly to a positive energy balance, the two terms are confusing and are not well defined in the literature. NHE (i.e., eating in the absence of hunger) and overeating/overconsumption are often used interchangeably (Hetherington, 2007; Kausman, 2004), however the mechanisms involved are quite different. According to Kausman (2004), NHE refers to food intake in the absence of an accompanying physiological sensation of hunger. Overeating, on the other hand, refers to eating past

the physiological sensations associated with satiety. Although they are inherently different behaviours, NHE and overeating are related, with NHE often preceeding overeating (Kausman, 2004).

The Boundary Model

Herman and Polivy (1983) developed the Boundary Model in an attempt to explain the relationships between hunger, satiety, NHE, and overeating. Although the Boundary Model does not explicitly refer to obesity, the model incorporates physiological and psychological aspects of eating behaviour, and has been used by researchers to describe patterns of normal and disordered eating including dieting, overeating, and bingeing (e.g., Ogden, 2003; Polivy & Herman, 1987).

According to the Boundary Model, eating behaviour is typically regulated by sensations of hunger and satiety. A person is driven to eat after experiencing physiological sensations of hunger and will stop eating once satiety is experienced. These boundaries of hunger and satiety are mostly determined biologically. They are influenced by physiological sensations associated with gastric contractions, levels of fatty acid, and hormones such as blood glucose, insulin, leptin, and cholecystokinin, which drive people to eat when hungry and encourages people to cease eating before the stomach reaches capacity (Herman & Polivy, 1983).

Herman and Polivy (1983) termed the period between hunger and satiety the zone of “biological indifference”. Their theory indicates that people enter the zone of biological indifference when they have consumed an adequate amount of food and therefore are not experiencing sensations associated with hunger or satiety. Herman and Polivy refer to NHE as food intake during the period of biological indifference. Overeating, on the other hand, refers to when one continues to eat despite experiencing the physiological sensations of satiety. Both NHE and overeating

increase overall energy intake, and, if physical activity is not sufficient, causes a positive energy balance. NHE and overeating are therefore thought to be important factors in the development and maintenance of obesity. NHE and overeating do not serve any biological / survival purpose, and are primarily believed to be driven by psychological and social factors (Kausman, 2004).

Psychosocial influences of eating behaviour can be broadly categorised into antecedents and immediate cues. Antecedents refer to previous experiences and attitudes to food, weight, and dieting that act as precursors in determining susceptibility to immediate cues that trigger an eating episode, that is, stimuli that trigger eating behaviour, either within the environment (social or sensory cues) or personal (e.g., emotional eating).

Antecedents

Attempts to understand the antecedents of obesity have been housed within various psychodyamic (Glucksman, Rand, & Stunkard, 1978), social learning/developmental (Birch, 1991), and cognitive/behavioural (Herman & Polivy, 1983) frameworks. These frameworks identify issues such as familial and social influences, uses and meanings of food and weight, and perceptions and experiences of dieting as factors that can contribute to NHE, overeating, and obesity.

The theories to emerge from the different psychological frameworks look at similar concepts (e.g., NHE, overeating, restrained eating, emotional eating), but their interpretation of these factors are different. For example, psychodynamic paradigms may explain emotional eating as occurring when people suppress their feelings inappropriately and nurture themselves through food, frequently as a consequence of family dynamics, such as in a power struggle between a child and parent (Wills-Brandon, 1993). Alternatively, the learning/developmental perspective may explain

emotional eating using the concept of reinforcement (e.g., a parent offers food to a child who is upset, which establishes a long-term association between food and comfort) or modelling (e.g., a child learns to rely on food for comfort after watching her mother eat when she is upset).

Familial and social influences. The family and social environment experienced as a child have been found to be important contributors to NHE and overeating as an adult (McCaffree, 2003; Mela & Sacchetti, 1991). Eating behaviours can be learned through direct observation and modelling and also influenced through indirect, broad social-cultural factors such as family, peers, society and cultural norms, and the media that shape beliefs and values on eating, dieting, and the meaning of food and weight.

Parents' weight, eating behaviour, and attitudes towards food and dieting are important predictors of eating behaviour among children. According to McCaffree (2003), parents play five roles that influence a child's weight and eating behaviour. McCaffree labelled these roles as "providers", "enforcers", "role models", "advocates", and "protectors".

As providers, parents are primarily able to determine the type and quantity of food that is available to their children. The food that is made available to children can lay the foundation to establishing long-term healthy or unhealthy eating behaviours. Many parents, especially those of overweight children, play the role of enforcer, through restricting or over-managing their child's food intake. Overly controlling children's food intake, however, can affect their ability to self-regulate their food intake later in life, and consequently they will learn to rely on cues other than hunger to determine their food intake. Overplaying the enforcer role can also lead to

restrictive dieting and dichotomous “all-or-nothing” approach to food intake that is detrimental to long-term weight management.

In addition, parents can act as role models who can influence behaviours and attitudes towards food, weight, and dieting. Demonstrating healthy or unhealthy eating patterns can shape positive and negative eating habits. Playing the role of an advocate refers to parents influencing their child’s environment, when outside of their direct care. One example of adopting the role of an advocate is when a parent attends school board meetings to help to promote healthy foods in canteens.

Given the extensive media coverage on the topic of children and adolescent obesity, parents need to act as protectors, and respond appropriately. The heightened awareness of obesity may increase anxiety and affect body-image and dieting behaviour among children, detrimentally influencing long-term weight management. The degree that each parent plays the five roles can shape a child’s behaviour and attitudes to eating, weight, and dieting.

Studies have found that, compared to children of parents of a healthy weight, children of obese parents tend to prefer high-fat, energy dense food (Mela & Sacchetti, 1991), are less likely to enjoy vegetables (Muller, Koertringer, Mast, Languix, & Frunch, 1999; Wardle, Guthrie, Sanderson, Birch, & Plomin, 2001), are more responsive to emotional and environmental cues triggering thoughts of food and eating (Braet & van Strien, 1997; Ganley, 1989), and have a more “overeating-type” of eating style (Wardle et al., 2001). In addition, there is evidence that parents who experienced food deprivation as children (e.g., due to the Depression), may influence their children’s attitudes to food. For example, many children previously deprived of food carry a fear of not having enough food into adulthood, and consequently they

ensure an abundance of food is always available. This fear and consequent behaviour have been found to transmit to their children (Brink, Ferguson, & Sharma, 1999).

Apart from shaping negative eating behaviours, parents can also influence healthy eating among children. Other positive role models who can successfully promote healthy eating include peers, older children, and fictional heroes (Birch, 1980; Contento et al., 1993; Klesges, Stein, Eck, Isbell, & Klesges, 1991).

Parents who diet have been shown to influence dieting behaviour in their children through passive modelling or by active encouragement of their children to restrict food intake. For example, Wertheim, Martin, Prior, Sanson, and Smart (2002) conducted a study involving 587 adolescent boys and 619 adolescent girls and one parent of each participant. All participants were required to complete a questionnaire assessing child dieting behaviours, body dissatisfaction, tendency to overeat, child's current and ideal size, mother and father dieting, and encouragement of the child to diet. Compared to boys and pre-menstural girls, menstrual girls whose mothers displayed dieting behaviours were also more likely to model their mothers' behaviour through restraining their eating and being dissatisfied with their bodies. Dieting is not only associated with body dissatisfaction, but paradoxically can increase the likelihood of the child becoming obese and cause NHE and overeating because of counter-regulation (overeating following a period of food restriction) (Birch, Fisher, & Davidson, 2003; Fisher & Birch, 2002; Hood et al., 2000). A detailed discussion on the relationship between dieting and NHE, overeating, and obesity will be provided later in the thesis (refer to section headed "History of dieting/overeating").

The underlying meanings of food and weight. Apart from providing essential energy and nutrients for day-to-day living, food can be used to serve many other purposes. These additional uses of food are often shaped in early childhood. For

example, many parents provide unhealthy food (such as a chocolate bar) as a reward for good behaviour, or they may withdraw treats following bad behaviour (Brink et al., 1999). When children are offered neutral food (i.e., food that is neither liked nor disliked) as a reward or paired with adult attention, often their preference for the food increases as the neutral food becomes associated with the positive experience (Birch, Zimmerman, & Hind, 1980). According to Birch et al. (1980), people who are rewarded with food at an early age are more prone to rewarding themselves with food as adults, and are more likely to prefer the foods they were rewarded with as a child. These types of food are often high in fat, sugar, and kilojoules.

The rules regarding food and eating that are established in childhood may also shape NHE and overeating in adulthood. For example, a child may be praised for eating all the food on his or her plate and then may continue to rely on the quantity of food on the plate to determine food intake as an adult, overriding the physiological sensations of satiety.

This pattern of eating all the food on the plate, regardless of satiation levels, has been observed more frequently in overweight women when compared to overweight men and people of normal weight (Brink et al., 1999). Brink et al. interviewed 162 males and females who were categorised either as currently obese, never been obese, or a “successful dieter” (as defined as having lost 15% of their body weight and had maintained the weight loss for at least a year). Participants were asked to reflect on their childhood memories of food. More obese participants (45%) reported that their families allocated rules regarding food and eating than successful dieters (20%) and those of a consistently healthy weight (19%). For example, 18% of obese participants recalled a childhood rule of having to eat all the food on their plates, compared to 7% of successful dieters, and no participants of a consistently

healthy weight. Their findings also suggested that childhood rules regarding food were more common for females (31%) rather than males (21%).

Food can also be used as a source of nurturing and comfort. Although eating in response to emotions is triggered by immediate internal cues, associations between food and emotional relief are often learned in childhood. These associations can cause a person to develop a predisposition to use food to cope with strong, negative emotions in adulthood. In addition, children may learn to use food and overeating as a substitute to, or as a means of showing love and affection, which can shape adult behaviour (Kaplan & Kaplan, 1957).

Food plays a central role in many cultures and can be associated with many meanings such as a treat, a celebration, rebellion (the “forbidden fruit”), a family get-together, being a good parent, or being a good child (Odgen, 2003). Food is a form of social interaction and can communicate love, power, and self-identity in terms of sexuality, conflicts, self-control, and gender. For example, in many cultures, women are expected to provide an abundance of food for their families while simultaneously being expected to deny themselves food in order to remain thin and sexually attractive (Charles & Kerr, 1986, 1987; Lawrence, 1984).

Body size can also be associated with underlying meanings. For example, thinness is often associated with attractiveness, control, success, and psychological stability (Ogden, 2003). Conversely, an overweight person often is perceived as unsuccessful, unpopular, lazy, unattractive, and gluttonous. These underlying meanings of food and weight can play an important role in shaping long-term eating behaviours.

History of Dieting/Restrained Eating

Another approach to understanding the antecedents of NHE and overeating has been to look at restrained eating. People are considered to be restraining their eating when they attempt to combat an urge to eat in an endeavour to lose weight (Ruderman, 1986). In addition, restraint may refer to eating a lesser quantity of food or less energy dense food (e.g., low fat) in an attempt to lose weight (Herman & Polivy, 1980).

Restraint theory proposes that many people who endeavour to restrain their eating (i.e., diet), eventually break their restrictive diets, and consume more food than if they had not been dieting. Overeating after a period of dieting is termed restrained eating (van Strein, Frijters, Bergers, & Defares, 1986). Restraint theory was originally developed to explain the different eating behaviours of obese and non-obese people, and is now emerging to be a foundation for the understanding and treatment of obesity.

Although food deprivation and restraint are different, in that restraint is specifically related to a weight-loss attempt, situations involving food deprivation offers naturalistic settings to study the effects of low food intake on future eating behaviour. The relationship between food deprivation and future overeating first emerged from a study during World War II (Franklin, Schiele, Brozek, & Keys, 1948). Franklin et al. consistently found that people who were starved of food later compensated for the starvation period by bingeing on food, and becoming obsessed with all aspects of food and cooking, even after the weight had been regained. In addition, Polivy, Zeitlin, Herman, and Beal (1994) found binge eating to be relatively rare among combat veterans, but significantly more prevalent among veterans in German Prisoners of War camps who lost significant amounts of weight during their captivity.

These findings have been used by researchers and healthcare professionals in an attempt to explain weight gain from yo-yo dieting (cycling on and off diets) and binge eating that is common among obese people and people trying to control their weight (Kausman, 2004; Loro & Orleans, 1981). For example, often people who restrict their food intake and lose weight while on a diet soon begin to have more thoughts involving food and eating, and ultimately consume more food than they would have prior to initiating the diet (Kausman, 2004).

The Boundary Model of eating, developed by Herman and Polivy (1983), offers an explanation for overeating following a period of restraint. According to the Boundary Model, the process of regulating eating among restrained and unrestrained eaters differs in two respects. First, it posits that the zone of biological indifference is larger for restrained eaters, causing a lower hunger boundary and a higher satiety boundary compared to unrestrained eaters. Therefore, it takes greater food deprivation for a person on a diet to experience feelings of hunger and greater food consumption to cause feelings of satiation. A larger zone of biological indifference means that restrained eaters are more susceptible to psychosocial factors in regulating their eating (Ruderman, 1986).

Second, restrained eaters are thought to have a third self-imposed “diet boundary” that is located between their hunger and satiety boundaries. This diet boundary determines their maximum desired food intake based on the type and amount of food they allow themselves to eat. If the diet boundary is transgressed, restrained eaters continue to eat up to, and often past the point of satiation. Their eating patterns are characterised by dieting and periodic overindulgence (Herman & Polivy, 1975, 1980).

Among restrained eaters, the diet boundary takes precedence over regulating eating, and physiological cues of hunger and satiety are typically ignored. If an unrestrained eater has recently eaten, he or she usually will not eat, or will reduce the amount of food consumed in the short term. Studies have consistently found, however, that when restrained eaters are provided with high kilojoule food and drink (called a pre-load) prior to a taste test, often they will eat more food during the taste testing (Herman & Mack, 1975; Herman & Polivy 1975, 1980; Hibscher & Herman, 1977). This is because the high kilojoule pre-load transgresses their diet boundary that would usually be their cue to stop eating. As the diet boundary has been transgressed, during the taste test restrained eaters do not have the diet boundary cue to stop eating, and therefore will consume food *ad libitum*. The process of overeating after ingestion of a relatively large amount of food is called counter-regualtion (Polivy & Herman, 1985). In addition, restrained eaters typically eat less food in a taste test following a low kilojoule pre-load. This is because after a low kilojoule pre-load they have not yet reached their diet boundary. In this situation, restrained eaters will only consume small quantities of food in the taste test to ensure they stay under their diet boundaries.

Herman and Mack (1975) provided 45 obese female restrained and unrestrained eaters with either zero, one, two, or three milkshakes, prior to a contrived taste test of ice cream. Consistent with restraint theory, participants of high restraint consumed more ice-cream after the two-milkshake pre-load than after consuming no milkshakes. Participants of low restraint consumed less ice-cream after the two-milkshake pre-load. Herman and Mack concluded that the two-milkshake pre-load transgressed the diet boundaries of the restrained eaters, and consequently they consumed larger quantities of ice-cream without consideration of satiety levels.

Although dietary restraint is associated with overeating, the mechanisms mediating the transition from successful dieting to overeating is not yet clear. Several explanations have been proposed to identify how and why restrained eaters become disinhibited, break their dieting rules, and overeat. The first of these concerns the dichotomous thinking that often governs a dieter's approach to food. Dieters perceive dieting violations in various ways, ranging from insignificant occurrences to catastrophic events (Paine, 1982). Overly negative appraisals of dietary transgressions can lead to guilt and other negative emotions which may increase the likelihood of overeating during future high risk situations (Grilo & Shiffman, 1984; Marlatt & Gordon, 1985). Conversely, an objective appraisal that neither minimises nor magnifies the importance of breaking the diet (e.g., "I feel satisfied after eating the chocolate and now I can get back to my healthy eating") may make subsequent overeating less likely (Marlatt & Gordon, 1985; Smith, O'Neil, & Rhodes, 1999).

Restrained eaters typically perceive dieting as an "all-or-nothing" event, where they are either on a diet (characterised by eating small amounts of low-kilojoule food within their diet boundary) or off a diet (where they no longer have self-imposed restrictions on the quantity and type of food and therefore are free to eat *ad libitum).* When the dieter gives in to the overpowering drive to eat, it is typically perceived as a lack of willpower. Interviews with restrained eaters have found that following ingestion of a forbidden food, dieters report thoughts representative of what Herman and Polivy termed the "What the Hell" effect, which is characterised by disinhibition, overeating, and sometimes total relapse (Herman & Polivy, 1975, 1980). Such thoughts may either be passive (e.g., "I can't be bothered, it's too much effort to stop eating") (Ogden & Wardle, 1991) or active rebellion against the diet (e.g., "I don't care now; I am just going to stuff my face") (Ogden & Greville, 1993). The transition

from lapse to relapse typically involves cognitive dissonance (e.g., “I am on a diet, but I have just eaten chocolate”), internal attributions (e.g., “It’s my fault”), and guilt (e.g., “I am a useless person) (Marlatt & Gordon, 1985).

Mood is another potential factor that may cause restrained eaters to break their diet patterns and consume more food compared to what they normally would if they had not been dieting. People prone to periods of dieting and overeating often have high standards and demanding ideals, frequently resulting in low self-esteem, self-dislike, and lowered mood (Heatherton & Baumeister, 1991). Negative emotions have been found to be potential triggers to overeating among restrained eaters (Baucom & Aiken, 1981; Heatherton, Polivy, & Herman, 1990). In an attempt to avoid this unpleasant state, the dieter either escapes self-awareness through overeating (Heatherton & Baumeister, 1991; Heatherton, Herman & Polivy, 1991; Heatherton, Polivy, Herman, & Baumeister, 1993) or uses the pleasant experience of eating to temporarily mask their negative mood.

Dieting typically involves restricting the type and amount of food that is allowed to be eaten. As this process requires eliminating certain food from the diet, in order to stick to the rigid eating plan the dieter may attempt to suppress cravings by avoiding any thoughts about the banned food. Paradoxically, thought suppression and thought control can have the opposite effect of making the thoughts that the individual is trying to suppress more prominent (Wegner, 1994). Dieters have been found to perceive food in terms of “forbiddeness” (King, Herman, & Polivy, 1987), and an active decision not to eat specific food has found to cause a preoccupation with the forbidden food (Grilo, Shiffman, & Wing, 1989; Ogden, 1995). Therefore, denying food through dieting may cause a stronger desire for the food, ultimately resulting in overeating. The relationship between dieting and overeating is an important

component of obesity research because a large proportion of obese people are classified as restrained eaters (Herman & Polivy, 1980, 1988; Hibscher & Herman, 1977).

Immediate Cues That Trigger NHE and Overeating

There are an extensive variety of cues that can trigger thoughts of food and eating, most of which can be categorised as either external or internal cues. External cues relate to triggers within the environment, whereas internal cues relate to thought processes and emotional responses within the individual (McKenna, 1971). A clear understanding of the role of internal and external cues in NHE and overeating is important, as obese people have been found to eat more for both internal and external reasons compared to non-obese people (Edelman, 1981; Ganley, 1989; Hudson & Williams, 1981; Nisbett, 1968, Plutchik, 1976).

Many researchers have approached the understanding of internal and external cues as being independent of each other, with numerous studies focusing on one specific cue measured in a laboratory setting (e.g., Oliver, Wardle & Gibson, 2000; Schachter & Gross, 1968). It is more likely, however, that internal and external cues often operate in conjunction with each other to produce NHE and overeating.

Although not independent of each other, there are marked differences between overeating that is triggered by internal cues compared with external cues. Wansink (1994) conducted a study on the antecedents and mediators of eating bouts (defined as food intake that was three times more than what one would normally eat in a given period). Participants were asked about a recent eating bout (type of food, amount consumed, etc) and were asked to indicate on a nine-point scale (1 = bad, 9 = good) as to whether they thought the eating bout was bad/good, foolish/wise, unreasonable/reasonable, and appropriate/inappropriate. In addition, on a nine-point

Likert scale, participants were asked to identify different characteristics of the food (e.g., nutritional value, if it could be substituted with other products, perishability, price), circumstances surrounding the eating bout (e.g., accessibility of the food), and feelings they associated with the eating bout.

Wansink (1994) found that although eating bouts involve the same food regardless of whether they are triggered by internal or external cues, eating that is triggered by internal cues is perceived as less reasonable, less healthy, and less enjoyable than eating that is triggered by external cues. In addition, eating bouts that are triggered by internal cues leave a person feeling more guilty, depressed, and lonely than eating that is triggered by external cues (causality, however, cannot be assumed, as it is likely these emotions were present before the eating bout and possibly contributed to the eating bout). Eating that is triggered by internal factors therefore may contribute to a cyclical pattern of eating as the emotional response to the eating bout (e.g., guilt, depression, loneliness) may trigger another internally driven bout. Because factors such as the nutritional value of the food, versatility, and perishability are disregarded during overeating that is triggered by internal cues, the cyclical pattern may be difficult to control.

Internal Cues

On strictly physiological grounds, emotional distress should suppress the desire to eat, because the physiological reactions to stress mimics the internal sensations associated with satiety (Schachter, Goldman, & Gordon, 1968). For example, fear inhibits gastric mobility (Carlson, 1916) and promotes the release of sugar into the bloodstream (Cannon, 1915). Nevertheless, as many obese people have learned to ignore the physiological cues of hunger and satiety, sensations of satiety when stressed will not discourage them to eat. Moreover, emotional distress has been

found to be a common trigger to eat among obese people (Ganley, 1989). In support of this finding, Rand (1982) found 79% of obese people gained 10 or more pounds during major life stress in comparison to only 9% of non-obese people.

Emotional eating (eating in response to emotions) among obese people is extremely common (Ganley, 1989). Several studies have found that between 84% (Edelman, 1981) and 100% (Woodman, 1980) of obese women overeat in response to a variety of emotional states. Among obese women, prevalence is consistent across social class and level of obesity (Ganley, 1989). Prevalence rates for emotional eating among males are less well established. Although most of the limited research available indicates emotional eating is more common among females than males (Ganley, 1989), a recent study of adolescents found no gender differences in emotional eating (Nguyen-Rodriguez, Unger, & Spruijt-Metz, 2009). In addition, emotional eating has been associated with excessive eating behaviours such as binge eating and night eating (eating after waking during the night) which can intensify a positive energy balance and contribute to obesity. For example, Pinaquy, Chabrol, Simon, Louvet, and Barbe (2003) found obese females who had binge eating disorder displayed higher scores on emotional eating than obese females who did not have binge eating disorder.

Kaplan and Kaplan (1957) were the pioneers of emotional eating research, devising the Psychosomatic Hypothesis to explain the contrasting eating patterns of obese and non-obese people. These authors proposed that obese people have learned to use NHE and overeating to reduce anxiety. They suggest that through social learning, early in development some children learn to use food in an attempt to cope with anxiety. This learned response (frequently learned from modelling of parental behaviour) is usually established in childhood, however, when personal and social

difficulties arise in adulthood, the overweight person is thought to once again resort to eating to control his or her discomfort. The Psychosomatic Hypothesis has been supported by several studies that show obese people consume more food during periods of high anxiety (e.g., McKenna, 1971; Plutchik, 1976).

Since 1957, research has found that motivations underlying emotional eating are much more complex than simple anxiety reduction. Although the Psychosomatic Hypothesis was focused on anxiety, other emotions have since been identified as potential triggers for NHE and overeating. In addition to anxiety, depression and anger are the most frequently identified emotional triggers to eating among obese people (Ganley, 1989). Furthermore, people with obesity commonly identify boredom, frustration, anger, unhappiness, loneliness, and fear as emotions that initiate NHE and overeating (Castelnuovo-Tedesco & Schiebel, 1975; Hudson & Williams, 1981; Schotte, Cools, & McNally, 1990; Weintraub & Aronson, 1969).

Interpersonal relationships and situations that involve a potential threat to ego or promote feelings of worthlessness, rejection, and abandonment also may trigger thoughts of food and eating (Heatherton et al., 1991; Hockley, 1979). For example, Hockley studied morbidly obese female participants shortly after weight loss surgery. Many of the participants reported experiencing interpersonal difficulties and overate in an attempt to feel better.

Over the past two decades, eating behaviour research has begun to focus on the role of diffuse emotions, which are less concrete and more difficult to recognise and label, in NHE and overeating. Much of this research is centred towards the symptoms of alexithymia. Alexithymia refers to a set of cognitive-emotional deficits that includes the inability to identify emotions, preference for concrete concepts, and avoidance in coping with conflicts or reporting emotions (Stifneos, 1996). People

with alexithymia tend to act rather than talk about their feelings (Stifneos, 1996), potentially increasing their susceptibility of using food to cope with overwhelming emotions. For example, people with alexithymia may prefer to relieve their emotional distress through eating rather than talking through their problems with another person.

The relationship between alexithymia and emotional eating in obesity is poorly understood as research in this area is limited (Pinaquy et al., 2003). Nevertheless, initial studies have suggested alexithymia is more common among obese people (Clerici, Albonetti, Papa, Penati & Invernizzi, 1992; Legorreta, Bull & Kiely, 1988), especially those with binge eating disorder who report eating in response to emotions (Pinaquy et al., 2003). Pinaquy et al. (2003) compared 169 obese women with and without binge eating disorder (BED). Following completion of various self-report questionnaires, findings indicated that alexithymia was the predictor of emotional eating in obese participants with BED, whereas perceived stress and depression were the predictors of emotional eating in obese participants without BED.

Recently, Larsen, van Strien, Eisinga, and Engels (2006) undertook a study exploring gender differences in the relationships of alexithymia, negative mood, and emotional eating in obese people. Larsen et al. (2006) found that difficulties in identifying or describing feelings were specifically associated with more emotional eating in men. The authors concluded that alexithymia is more strongly involved in emotional eating for obese men than women.

Extending on studies of emotional eating and alexithymia is a study examining the effect of emotional suppression on romantic relationships and eating (Butler, Young, Randall, 2010). During days when women with a higher BMI reported high levels of suppressing emotions, their male partners reported reduced negative feelings

towards them and the women reported eating more than usual. These effects were reversed (partner feelings) or non-existent (eating) for women with lower BMIs. These results suggest that overweight and obese women please their partners when they suppress emotion, but in doing so increase their risk of overeating. Studies examining gender differences are scarce and, as emotional eating is considered primarily a female behaviour, further exploration on gender differences in alexithymia, suppression of emotions, and overeating is needed.

A large volume of research has been undertaken to describe the characteristics of obese people who are sensitive to emotional triggers to eating (e.g., Ganley, 1989; Sunkard, 1959a, 1959b). Most obese people who are emotional eaters do not resort to food every time they experience an unpleasant emotion. Instead, emotional eating is most common when there is sufficient overall stress (such as several daily hassles) and not necessarily in response to brief or transitory bouts of emotion (Ganley, 1989). Emotional eating during periods of life stress is often correlated with binge eating and night eating syndrome (Stunkard, 1959a, 1959b), and typically involves tasty food that is high in overall kilojoules, in particular fat and carbohydrates (Ganley, 1989; McKenna, 1971; Oliver & Wardle, 1999; Oliver et al., 2000).

Several suggestions have been proposed to explain why people eat in response to strong emotions. One of these suggestions is that some people are motivated to eat during periods of strong emotion as eating serves as a distraction, temporarily moving attention from the emotional response to observing, biting, and chewing food (Heatherton & Baumeister, 1991 Heatherton, et al., 1991; Heatherton et al., 1993). More recently, however, Polivy and Herman (1999) suggested that rather than using overeating to escape self-awareness, dieters might overeat as a way of masking any negative emotions with the temporary heightened mood caused by eating.

Although some studies have found that eating during periods of strong emotions does not reduce the intensity of the negative mood of obese people (McKenna, 1971; Wansink, 1994), other research has found that negative emotions are perceived to be reduced after eating (Robinson, Folstein, Simonson, & McHugh, 1980; Slochower & Kaplan, 1980), which may increase the likelihood of future emotional eating. For example, Robinson et al. (1980) found a standard liquid meal reduced anxiety more for obese than normal-weight participants, and Slochower and Kaplan (1980) found diffuse, difficult to label emotions could be reduced through eating.

Ganley's (1989) review on the eating behaviours of obese people found affect reduction to be a motivational factor for emotional eating in over two-thirds of the studies examined. Specifically, after emotional eating, some people report feeling drowsy and sluggish (Edelman, 1981; Swanson & Dinello, 1970). Other studies, however have found negative emotions such as guilt, regret, and self-hatred are also common (Bruch 1973; Gormally, Black, Daston, & Rardin, 1982; Stunkard, 1959b).

Research has suggested that stress-prone individuals may be particularly sensitive to dietary effects on brain pathways influencing mood and coping (Markus et al., 1998) and, therefore, they may learn to self-medicate with reinforcement from the pleasant sensations derived from the physical effects of food. For a detailed discussion on the physiological response of eating on mood, the reader is directed to Oliver et al. (2000).

The available literature has focused primarily on the role of negative emotions in NHE and overeating. It is unclear, however, whether positive emotions such as happiness, excitement, and euphoria, also may trigger NHE and overeating, and consequently play an important role in the development of obesity.

External Cues

A decade after Kaplan and Kaplan's (1957) work inspired research into the role of emotions in obesity and overeating, Schachter (1968) suggested that overeating among obese people predominantly is related to cues in the environment. According to Schachter's research, obese people tend to be hypersensitive to external, food-related, and non-food related stimuli. Schachter proposed that rather than relying on physiological cues of hunger and satiety to regulate their eating, obese people are influenced by cues within the environment that trigger thoughts of food and eating. Examples of external factors include qualities of the food (e.g., taste, smell, texture), associations / habits (e.g., eating because it is "lunchtime"), visual cues, and social influences. Since the externality theory was proposed, a body of research has explored the role of a variety of environmental factors in NHE, overeating, and obesity.

Qualities of the food. Irrespective of body weight, most people consume larger quantities of food if it looks, smells, and tastes appealing. Nevertheless, the extent to which these factors influence the amount of food that is consumed relative to physiological factors (i.e., hunger sensations) differs between obese and non-obese people (Nisbett, 1968). Obese people tend to base food intake on taste and other associated qualities of food, with minimal regard to physiological sensations of hunger and satiety (Nisbettt 1968; Rodin & Slochower, 1976). Although non-obese people are also influenced by the appealing qualities of food, unlike obese people, once sensations of satiety begin, these food factors becomes less important than avoiding feelings of fullness. These findings suggest that the hedonic qualities of the food may be a factor in NHE among obese and non-obese people alike, but seems to be a greater factor in overeating among obese people.

Associations/habits. For a person to eat when hungry and stop when satiated, he or she must be able to accurately recognise the physiological sensations that are associated with hunger and satiety. Polivy and Herman (1987) suggest that these physiological sensations associated with hunger and satiety can be conditioned and therefore influenced by stimuli previously unrelated to food. Therefore, if meals are reliably paired with certain stimuli, such as time (e.g., at a specific time or after every four hours), hunger and satiety will be perceived when such cues are presented, regardless of the person's actual state of nutritional deficit (Stunkard, 1975; Weingarten, 1985). Other events that are commonly associated with eating include arriving home from work or watching a movie (Kausman, 2004). It might also be possible for hunger and satiety to be conditioned to internal cues (e.g., boredom). Nevertheless, research in this area is scarce and more studies are required to gain a greater understanding of how internal cues may be conditioned to the sensations of hunger and satiety.

In a series of three studies, Rodin (1975) explored the role of time (external cue) and boredom (internal cue) on the food intake among obese and non-obese people. He found that when bored, obese people typically found time to pass slower than non-obese people, and as a consequence, they ate sooner. Rodin concluded that the obese people relied on the passage of time to determine when they ate whereas non-obese relied on feelings of hunger and satiety.

Many people eat at regular and often pre-determined times of the day, whether it be due to convenience or habit (Kausman, 2004). Schachter and Gross (1968) explored this phenomenon by modifying clocks prior to an experimental taste test to induce participants into believing the taste test was occurring before or after the time they usually ate dinner. They found that compared to people of a healthy weight,

obese people consumed more food during a taste test when they believed it to be past their usual “dinnertime” and less food when they thought it was before the usual time they consumed dinner. The food intake of non-obese participants, however, was not affected by the altered times. Schachter and Gross concluded that obese people rely on time to regulate the quantity of food they consume whereas people of a normal weight are not affected by time, and instead predominantly use internal cues of hunger and satiety to regulate their food consumption.

Visibility and convenient access to food. When food is frequently visible throughout the day, thoughts of eating become more salient. In addition, some studies have shown that people consume food more frequently and in larger quantities when food is visible and convenient (Fisher & Birch, 1999; Painter, Wansink, & Hieggelke, 2002; Rodin & Scholower 1976). Moreover, Wansink, Painter, and North (2005) found visual cues relating to portion sizes could increase consumption without altering estimated intake or satiation. Wansink and his colleagues recruited participants to eat soup from a combination of normal bowls and bowls that slowly and imperceptibly self-refilled with soup as the contents were consumed. When participants unknowingly ate from self-refilling bowls they consumed an average of 73% more soup than when they consumed soup from regular bowls. Participants did not believe they had consumed more soup from the self-refilling bowl compared to the regular bowls, nor did their satiation levels change across the two conditions. These findings highlight the importance of visual cues in determining portion size and overall satiation level.

Despite evidence suggesting that visibility and accessibility of food can influence the amount of food that is consumed, the role of these factors in contributing to NHE, overeating, and obesity is poorly understood. More research is

required to gain a greater understanding of how visual cues influence eating behaviour of obese and non-obese people, and restrained and unrestrained eaters, within a variety of different foods and situations.

Social influences. Research exploring the role of the presence of others on eating behaviour incorporates three approaches of social facilitation, impression management, and modelling. In general, people tend to eat more when eating with others than when eating alone (social facilitation) (Bellisle, Dalix. & de Castro, 1999; de Castro, Brewer, Elmore, & Orozco, 1990). In situations where people are eating in the presence of others whom they believe are observing or evaluating them, however, individuals typically consume less food than when eating alone (Conger, Conger, Costanzo, Wright, & Matter, 1980; Roth, Herman, Polivy, & Pliner, 2001). Modelling studies, however, have found that when people eat in the presence of others who are eating either a little or a lot of food, the individual tends to eat a similar amount to their eating companion (Goldman, Herman, & Polivy, 1991; Polivy, Herman, Younger, & Erskine, 1979).

The findings from studies that have explored the role of social influences on the eating behaviour of obese people have focused on modelling and impression management. Although an early study found that obese participants did not reduce their food intake when eating in company of a person who consumed only a small amount of food (Nisbett & Storms, 1974), most studies have found that obese and non-obese people, and restrained and unrestrained eaters are equally as vulnerable to modelling effects (Herman, Koenig-Nobert, & Peterson, 2005; Polivy et al., 1979; Rosenthal & Marx, 1979). Nevertheless, obese people are considered to be particularly vulnerable to the effects of impression management, due to stigma and to

deflect the insinuation that their obesity is attributable to excessive eating (Herman, Roth, & Polivy, 2003).

De Luca and Spigelman (1979) observed female obese participants and found they consumed very small amounts of food in the presence of a non-obese person, but ate large quantities when accompanied by another obese person who also ate a large amount of food. Follow-up questioning revealed participants did not consume a large quantity of food while in the company of the non-obese person as they felt self-conscious. These contrasting behaviours may have been because obese people tend to be more concerned about impressing a non-obese person, or obese people generally may perceive a person of a healthy weight to be more judgemental of the quantity of food that the obese person consumes (Herman et al., 2003). Altered social norms within each condition regarding the appropriate amount of food to consume may have also contributed to the different food intakes.

Causality of external responsiveness. In the 1970s, research by Rodin (1973) suggested that the observation that obese people are more sensitive to external triggers to eating might apply to a more generalised "hyper-external" response style. Rodin proposed that, through biological processes or early learning experiences, obese people become more sensitive to external stimuli, both food related and non-food related. Rodin and Scholower (1976) extended on this theory to determine the causality of hyper-externality in obese people. After increasing the visibility and availability of food to children on an eight-week camp, Rodin and Scholower found a positive relationship between external responsiveness and amount of weight gain during the eight weeks. Children who were deemed high in external responsiveness responded to the additional food cues and increased their food intake accordingly. The

authors concluded that hyper-externality in the obese preceeded weight gain, and could be used to predict obesity.

Findings of a study undertaken by Stoens & Braet (2007) also support Rodin and Scholower's hyper-externality theory. Eighty-seven adolescents completed an imbedded word task containing high-calorie food words and matched control words. A free-recall task was used to detect explicit memory bias. Overweight adolescents (but not healthy weight adolescents) showed an explicit memory bias for food stimuli. The authors suggested that the food-based memory bias in overweight youngsters may reflect a later-stage activation of food-related schemata which could influence food-related preoccupations and overeating.

Interrelationship Between Internal Cues and External Cues

Both psychosomatic and externality theories suggest that eating is determined by internal or external cues, respectively, thus implying that the two types of eating behaviour cues operate independently. Slochower (1983), however, suggested that emotions and the environment could operate in conjunction with each other to influence NHE and overeating. This proposal was suggested following research indicating that high uncontrollable anxiety enhanced the sensitivity of overweight people to external cues (Slochower, Kaplan, & Mann, 1981). Another example was illustrated by Rodin (1975) who found obese people who were bored perceived time to pass slower, and therefore ate sooner than non-obese people. Nevertheless, studies examining the interrelationship of internal and external cues have been minimal, and consequently a large gap exists in the research investigating whether cues operate independently, interactively, or in serial. Further research investigating the interrelationship of internal and external cues on eating behaviour therefore is required for definitive conclusions to be drawn.

Summary of Antecedents and Immediate Cues of NHE and Overeating

Initial research into the antecedents and immediate triggers that influence eating behaviour have studied these factors separately, however, more recent research suggests there is an interrelationship between the immediate cues and the antecedents to NHE and overeating (Eertmans, Baeyens, & Van den Bergh, 2001; Lindeman & Stark, 2001). For example, a person may be more susceptible to a specific cue because of an antecedent (e.g., a child is always given meals at certain times of the day and, as an adult, may be susceptible to the immediate cue of time to govern eating behaviour).

Another example of the interrelationship between antecedents and cues to eating is the association between restraint and susceptibility to internal and external eating cues. Herman and Polivy (1980) have proposed that obese people are more likely to eat in response to external and emotional cues because of their tendency towards dietary restraint, rather than as a result of their obesity per se. This proposal has been supported by laboratory and naturalistic studies demonstrating that negative emotional states such as anxiety (Herman & Polivy, 1975; Polivy, Herman, & McFarlane, 1994) and depressed mood (Baucom & Aiken, 1981; Cooper & Bowskill, 1986; Frost, Goolkasian, & Ely, 1982**;** Ruderman, 1985**;** Schotte et al., 1990) induce overeating in restrained eaters but not in unrestrained eaters.

Research exploring the relationship between restraint and internal and external eating has been inconsistent. Various studies have found that restrained eaters are more susceptible to eating in response to external cues (e.g., Fisher, 1998), however Wardle et al. (1992) found external eating to be attenuated by restraint. Although some studies have found a positive relationship between emotional and restrained eating (Herman, Polivy, Pliner, Threlkeld & Munic, 1978; Lindeman & Stark, 2001;

Polivy et al., 1994; Polivy, Herman, & Warsh, 1978; van Strien et al., 1986) other studies have found the correlation to be quite low (van Strien, 1996; van Strien, Frijters, Roosen, Knuiman-Hijl, & Defares, 1985; Waller & Osman, 1998). These inconsistencies highlight the diversity of the eating behaviours of obese people and restrained eaters and the importance of research that recognises the individuality within the two groups.

Methodological Issues of Eating Behaviour Research

For a greater understanding of this field, researchers need to acknowledge the complexities of methodological issues associated with obesity, eating behaviour, and food intake. These issues include the characteristics of obesity, and complexities associated with the collection, analysis, and interpretation of data. Obesity has been described as having a dynamic phase (becoming obese) and a static phase (maintaining a level of obesity) (Garrow, 1974). Consideration of these phases in research is important, especially when comparing eating behaviour of obese and non-obese people, as studies have found that it make take fewer kilojoules to maintain a level of obesity than it does to become obese in the first place (Ogden, 2003). Therefore, obese people may overeat (compared to the non-obese) in the dynamic phase and under-eat (compared to the non-obese) in the static phase of obesity.

Several authors have acknowledged reliability and validity concerns with eating behaviour research, particularly measuring food intake (Heitmann & Lissner, 1995; Hill, Rogers & Bundell, 1995; Ogden, 2003; Prentice, Black, & Goldberg, 1986). To gain a greater understanding of eating behaviour, it would be useful for researchers to find a balance between the precision and internal validity characteristic of laboratory studies, and the naturalness and external validity of measuring eating behaviour in one's own environment. Each method has positive aspects as well as

several limitations, and the process of data collection may change the type and quantity of food that is consumed. Laboratory studies do not involve people in natural conditions and self-reporting methods are open to forgetting and social desirability. Underreporting of food intake can occur with participants of any weight group, but is most common among obese people, who have been found to often omit snack foods and foods high in fat from checklists and food diaries (Heitmann & Lissner, 1995; Prentice et al., 1986).

Most research exploring the eating behaviour of obese people is correlational and cross-sectional. These methods do not enable causality to be determined and do not acknowledge that the type and quantity of food that is eaten in the dynamic phase may be quite different to food consumed in the static phase of obesity. In addition, it is important to consider differences between data relating to overall population trends (e.g., changes in activity level/changes in energy intake of the overall population) and that relating to specific group comparisons (e.g., comparisons between obese and non-obese). This consideration is necessary because data that uses overall trends may show a pattern that is vastly different to group comparisons (Ogden, 2003). A variety of data collection methodologies therefore are needed for a complete understanding of the eating behaviours of obese people in both the dynamic and static phases of their weight. In addition, recognition of individual differences among obese people is necessary to avoid simplifying and categorising eating behaviour as either an “obese” or “non-obese” behaviour. For an in-depth review of methodological issues in eating behaviour research, the reader is directed to Hill et al. (1995).

Summary

Obesity has become a global epidemic and is responsible for serious health, psychosocial, and economic problems. Obesity and overweight are caused by a

complex interplay of biological, environmental, and psychosocial factors that promote a positive energy balance (energy intake greater than energy expenditure) for a sustained period. For a positive energy balance to occur, a person must consume more food than the body requires, typically through non-hungry eating (NHE) (food intake in the absence of an accompanying physiological sensation of hunger) and overeating (eating past the physiological sensations associated with satiety). NHE and overeating are more common among obese people and are thought to be important contributors to obesity.

NHE and overeating serve no biological / survival purpose and are driven primarily by psychological and social factors, broadly categorised as antecedents and immediate cues. Antecedents refer to previous experiences and attitudes to food, weight, and dieting, such as family and social influences, the uses of food, and the underlying meanings of food and weight. In particular, the effects of restrictive dieting on NHE and overeating have been studied extensively. Antecedents shape current behaviour and act as precursors in determining one's susceptibility to immediate cues. Immediate cues refer to stimuli that trigger thoughts of food and eating, which are either in the environment (external cues) or within the individual (internal cues). External cues include hedonic aspects of food (e.g., taste, smell), habits and associations, visibility and convenient access to food, and social influences. Internal cues refer to eating in response to emotions such as stress, loneliness, depression, anger, and boredom. Research suggests that obese people are more susceptible to both internal and external triggers in determining food intake, whereas non-obese people tend to rely more on feelings of hunger and satiation as indicators of when to begin and stop eating. In addition, internal and external cues have been found to be interrelated, however the exact mechanisms of this relationship are not clear.

Antecedents and a person's responsiveness to internal and external cues are also interrelated. In particular, studies have found that restrictive dieting may increase one's susceptibility to internal and external cues. Some researchers go so far to suggest that the higher susceptibility of obese people to internal and external cues can be solely attributed to the restrictive dieting that is more prevalent in this population, rather than the obesity per se. Nevertheless, this proposal has yet to be explored adequately.

The immediate cues that trigger NHE and overeating, and the antecedents that determine one's susceptibility to eat more than is required, are important factors in the understanding of how people become obese and sustain their obesity. Considering the vast number of psychological and social factors that can influence NHE and overeating, more research is currently needed to provide a greater understanding of the underlying mechanisms that determine the eating behaviour of people with obesity and to ultimately provide better weight loss treatment.

The Present Research

The key aims of this research were to compare the prevalence of non-hungry eating (NHE) and overeating in obese and non-obese people and explore and compare reasons underlying NHE. Specifically, internal and external cues, restrained eating, and other antecedents to NHE and overeating were explored. Gender differences in prevalence and reasons underlying NHE and overeating were also compared and explored, as currently there is a large gap in the research comparing gender differences in the cues and antecedents of eating behaviour. While Study 1 was originally intended to compare only people in the obese and healthy weight range categories, data were also inadvertently collected for people who were overweight, but not obese. These data were therefore included in the analysis and discussed

throughout the report. In addition, the research aimed to provide personal accounts of the triggers and antecedents of NHE and overeating by describing case studies of three different people with obesity.

CHAPTER 3

STUDY ONE: A QUANTITATIVE COMPARISON OF EATING BEHAVIOUR

Introduction

The focus of Study 1 was to gain a more detailed understanding of the immediate cues and antecedents of the eating behaviours of obese and non-obese adults. A quantitative survey approach was used to examine emotional eating, external eating, restrained eating, and other cues and antecedents of eating behaviour. Although the main purpose of the study was to compare people who were in the obese and healthy weight range, a number of people who were in the overweight range but not obese also returned questionnaires and their data was included in the analysis.

Method

Participants

Obese participants were recruited from four Melbourne-based health clubs and an eating behaviour and weight management clinic in Melbourne. Approximately 200 questionnaires were distributed, with a response rate of 15% (n = 29). To increase sample size, additional obese participants were recruited through word of mouth by personal trainers and fitness instructors. People in the healthy weight range were recruited by a convenience sample from the general population, and from staff at a private hospital in Melbourne, including doctors, nurses, and allied health professionals. Sixty questionnaires were distributed to this group, with a response rate of 72% (n = 43).

Participants included a total of 24 males and 48 females from three weight groups: healthy weight range (HWR) (BMI 18 – 25.5) (n = 43), overweight (BMI 25.6 – 29.5) (n = 11) and obese (BMI > 29.5) (n = 18). These BMI categories were slightly different to the WHO categories in order to derive three distinct groups. The

initial phase of the study originally targeted only HWR and obese participants, however, as a number of people who returned questionnaires were overweight but not obese, a separate overweight group was included in the analyses.

Materials/Procedure

Participants received a questionnaire package containing a plain language statement outlining the background, objectives, and confidentiality considerations for the research, three questionnaires, and an addressed reply-paid envelope. A copy of the plain language statement and questionnaires can be found in Appendix A and B respectively.

The first questionnaire requested demographic details from participants (e.g., age, gender, nationality, marital status, etc) as well as information relating to family history of eating disorders and overweight/obesity. Each participant self-reported their height and weight so the researcher could calculate their BMI. In addition, participants were asked to provide details about any current weight loss treatments they were undergoing or weight loss practices/programs they were involved in.

The second questionnaire comprised the Dutch Eating Behavior Questionnaire (DEBQ) (van Strien et al., 1986). The DEBQ is a widely used instrument that provides an assessment of restrained eating (restricting the type or amount of food intake for the purpose of losing weight), emotional eating (food intake that is triggered by emotions such as depression or anxiety), and external eating (food intake that is triggered by external cues such as social situations or the hedonic qualities of food including taste and smell). The DEBQ has three separate scales for restrained eating, external eating and emotional eating. The emotional eating scale has a further two subscales incorporating clear emotions and diffuse emotions. The DEBQ consists of 33 items, with each item scored on a five-point scale: 1 (never), 2 (seldom), 3

(sometimes), 4 (often), 5 (very often). The score for each scale is the average score for all items on the scale.

The restrained eating scale has 10 items that explore the restriction that a person places on the type or amount of food consumed for the purpose of weight loss. Examples of items on this scale include “Do you deliberately eat less in order not to become heavier?” and “Do you deliberately eat foods that are slimming?”.

The external eating scale has 10 items that examine cues within the environment that may trigger thoughts of food and eating. Examples of items on the external eating scale include “If food tastes good to you, do you eat more than usual?” and “If food smells and looks good, do you eat more than usual?”.

The emotional eating scale has a total of 13 items that are categorised into eating in response to either “clear” emotions (emotions that are easily recognised / labelled) or “diffuse” emotions (emotions that are difficult to recognise / label). The clear emotions subscale comprises nine items. Examples of these items include “Do you have a desire to eat when you are anxious, worried, or tense?” and “Do you have the desire to eat when you are irritated?” The diffuse emotions subscale contains four items. Examples of these items include “Do you have a desire to eat when you have nothing to do?” and “Do you have the desire to eat when somebody lets you down?” Three emotional eating scores are provided – one for each of the subscales, and an overall total emotional eating score (comprising the mean of all items on both subscales).

When tested within an adult population of men and women (of a variety of weight and clinical and non-clinical populations), the DEBQ has a high degree of dimensional stability (van Strien et al., 1986; Wardle, 1987). Each scale has high internal consistency and factorial validity (van Strien et al., 1986). Van Strien et al.

assessed the internal consistency of the five subscales of the DEBQ with 1170 obese and non-obese males and females. Cronbach's alpha values were .95 for restrained eating, .94 for emotional eating (total), .93 for emotional eating (clear), .86 for emotional eating (diffuse), and .80 for external eating.

The third questionnaire was developed specifically for this study and was based on the literature relating to restrained, external and emotional eating. This questionnaire addressed additional cues and antecedents of eating behaviour that were not included in the DEBQ. The first section required participants to identify the percentage of non-hungry eating (eating that is triggered by factors other than physical hunger) in which they engaged in. This was done by placing a mark on a 13 cm linear scale, anchored at the ends with 0% and 100%, and markers placed proportionately at 25% intervals along the scale. Three other questions were included that assessed the influence of physiological hunger cues on eating behaviour. These questions were: Do you eat to avoid the feelings of: a) having an empty stomach?, b) low energy levels? c) other sensations of hunger? Responses were measured on the same five-point scale as used in the DEBQ.

Overall eating patterns were assessed through textual responses outlining participants' consumption of meals and snacks throughout a typical day. Eating that is triggered by habit / environmental association was also explored through textual responses of participants describing situations when they were likely to eat out of habit (eating that is part of a routine, e.g., eating while watching television or after immediately arriving home from work).

The emotional eating subscales of the DEBQ do not include items on emotional eating in response to positive emotions or emotional reactions after overeating. Negative emotions after overeating are thought to contribute to a

dichotomous approach to dieting (perceptions of either dieting or not dieting), and counterregualtion (overeating after breaking a diet) (Kausman, 2004). Research examining the role of positive emotions on overeating is limited. Additional items therefore were included to explore these aspects of eating behaviour. Responses were assessed using the same five-point scale as used in the DEBQ and a tick box response code. Examples of these items include "Do you have the desire to eat when you are happy?" and "When you have eaten too much, do you feel (tick all relevant boxes) (a) guilty (b) ashamed, (c) disgusted, (d) satisfied, (e) relaxed, (f) relieved, (g) numb, (h) in high spirits?"

Characteristics of eating behaviours (bingeing, eating quickly, eating after waking during the night) were assessed, as these behaviours can contribute to non-hungry eating, overeating, and weight gain. Responses were scored using a five-point scale. An example of these questions includes "Do you feel that you eat quickly?"

Location of eating was also explored, as the eating environment has been found to influence eating behaviour (e.g., habit eating, social eating, etc) (Roth et al., 2001). Participants were asked to rank the most common places where they consumed food. A question was also included to assess the visibility of food during a typical day.

Information was also requested regarding participants' previous experiences of food and weight in order to obtain details regarding the establishment of early patterns of eating behaviour (i.e., antecedents of eating behaviour). These questions were scored using the same five-point scale as the DEBQ. Examples include "In the past to what extent was food given as a reward, an incentive, or to soothe physical and emotional pain?" and "In the past to what extent was tasty food denied because it was unhealthy?"

The final section of the questionnaire examined dieting perceptions including motivations to lose weight, counter-regulation (eating more food after breaking a diet), and how participants attributed excess weight (e.g., lack of will power, genetics, luck/chance/fate). All responses were rated on the same five-point scale as the DEBQ. An example of questions relating to dieting perceptions is “Over the past six months, have you wanted to lose weight for your family/partner?”

At the end of each section (as well as following some individual questions) participants were provided with space to make any additional comments if they wished. Participants were thanked for their contribution and asked to tick a box and provide their name and contact details if they were interested in participating in the second phase of the study involving a face-to-face interview.

Data Analysis

Statistical descriptive summaries (e.g., means, standard deviations, effect sizes, frequencies) were calculated for demographic variables, scores on the DEBQ subscales, and other single items included in the questionnaire package. For each of the subscales of the DEBQ and the percentage of non-hungry eating, comparison scores for the different weight groups and across gender were calculated by way of a two-way ANOVA. Where significant differences were evident in the two-way ANOVA, a Tukey’s post-hoc analysis was undertaken. Because of the small and uneven sample sizes, Cohens d effect sizes were also calculated to determine the magnitude of differences between the weight and gender groups. To identify relationships between scores on the various DEBQ subscales, Pearson correlations were calculated for each of the subscales and across each of the three weight groups.

Textual responses were analysed independently for common themes by two researchers (student researcher and the principal supervisor). The textual responses

were, in most cases, short phrases or one or two words and contained no detailed dialogue from the respondent. From the textual data, the two researchers independently identified common and unique themes across participants' textual responses. Both researchers discussed and compared identified themes and ensured consensus was achieved regarding the identification of themes. This process of cross-checking served as important reliability check so as to minimise the intrinsic bias that can come from single-observer research (Patton, 2002).

Results

Demographics

A total of 72 questionnaire respondents participated in the study, 67% of whom were female. The ages of participants ranged between 18 and 63 years, with an average of 38.8 years (*SD* = 10.8). Eighteen participants were classified as obese, on the basis of measures of body mass index (BMI), and 43 participants were within the healthy weight range (HWR). These BMI categories were slightly different to the WHO categories in order to derive three distinct groups. The research initially aimed to compare the eating behaviour of obese and healthy weight range participants. As some respondents (*n* = 11) had BMIs within the overweight range, this third group was also included in the analysis. Table 1 presents summary details of age, BMI, and gender, overall, and for participants across each of the three weight groups.

Table 1

Summary Descriptives of Demographic Information for Participants in the Three Weight Groups: (Healthy Weight Range, Overweight, and Obese)

		Body Mass Index		Gender		Age (Years)	
Weight Group	*n*	*M*	*(SD)*	Female	Male	*M*	*(SD)*
HWR	43	22.7	(1.81)	72%	28%	36.1	(8.9)
Overweight	11	26.8	(1.13)	64%	36%	44.9	(13.1)
Obese	18	33.6	(3.33)	56%	44%	41.4	(11.9)
Overall	72	26.1	(5.10)	67%	33%	38.8	(10.8)

The 43 participants in the HWR group were aged between 19 and 60 years (*M* = 36.1 yrs) and had BMIs ranging from 18.4 to 25.4 (*M* = 22.7). Approximately 50% of HWR participants were married or in a de facto relationship, and a similar proportion (48%) of participants had at least one child. Within the HWR group, 70% of participants had an immediate family member who was overweight. Of the family members who were overweight, 40% were reported to be slightly overweight (5-10kg), 50% were moderately overweight (10-20kg), and 10% substantially overweight (20+kg). The mother was the most frequently reported overweight family member (40%) followed by the father (27%). In addition, four (7%) HWR participants were aware of a family member who had experienced an eating disorder. These family members included a sister and mother who had bulimia, and an aunt and cousin who had anorexia nervosa.

The 11 participants in the overweight group had BMIs ranging from 25.7 to 28.4 (*M* = 26.8), and were aged between 25 and 68 years (*M* = 44.9). More than two-thirds of the overweight participants were female (64%). Most overweight participants were either married (46%) or in a de facto relationship (27%) and had at least one child (73%). No overweight participant reported an eating disorder within their immediate family, however 73% reported an immediate family member who was

currently overweight, most commonly their mother (38%) and/or father (38%). In most cases, participants reported that the family member was moderately overweight (43%) compared to slightly (29%) or substantially (29%) overweight. One male and one female overweight participant were currently undergoing weight loss treatment, from a personal trainer and through a commercial weight loss program, respectively.

The 18 participants in the obese group had BMIs ranging from 30.0 to 43.0 (*M* = 33.6). The participants were aged between 21 and 59 years (*M* = 41.4). Similar to the other groups, the majority of participants were female (56%), although the gender distribution was more even in this group compared to other two groups. Most of the obese participants were married (50%) and / or had at least one child (56%). The majority of obese participants (72%) had a family member who was overweight, usually their father (43%) and/or mother (36%). In most cases the family member was reported to be moderately (40%) or substantially (33%) overweight. Two participants (11%) reported that they were aware of at least one family member who had experienced an eating disorder. One participant had a sister with anorexia nervosa, and another identified a mother and a sister with anorexia. Seven (6 females, 1 male) of the 18 obese participants were receiving treatment to lose weight. Two participants were receiving treatment from a personal trainer, two from a general practitioner, and one from a commercial weight loss program. One participant was receiving weight loss treatment from a combination of a commercial weight loss program and general practitioner, and another from a combination of a general practitioner, personal trainer, and a self-help book.

Dutch Eating Behaviour Questionnaire Subscales

All participants completed the Dutch Eating Behaviour Questionnaire (DEBQ) which contains five subscales including restrained eating, external eating, and three

separate emotional eating scales (clear emotions, diffuse emotions, and total emotional eating). All questions are scored on a five-point Likert-type scale with the response categories: never (1), rarely (2), sometimes (3), often (4), and very often (5). Total scores on each of the scales are determined by averaging the scores for items on each subscale. Calculation of Cronbach alpha coefficients revealed that all five subscales of the DEBQ had strong internal consistency for the current overall sample: Restrained Eating, r = .87; External Eating, r = .80; Emotional Eating (Total), r = .94; Emotional Eating (Clear), r = .92; Emotional Eating (Diffuse), r = .80. Means and standard deviations were calculated for scores on the five subscales of the DEBQ, separately for the three different weight groups, and for male and female participants. These summary statistics are presented in Table 2.

Table 2

Means and (Standard Deviations) for Scores on the DEBQ Subscales for Males and Females Across the Three Weight Groups: (Healthy Weight Range, Overweight, and Obese)

		DEBQ subscales				
		Restrained eating	External Eating	Emotional total	Emotional clear	Emotional diffuse
HWR	Females	2.97 (0.65)	3.12 (0.50)	2.17 (0.56)	1.94 (0.64)	2.69 (0.66)
	Males	2.14 (0.86)	2.88 (0.52)	1.57 (0.68)	1.41 (0.62)	1.93 (0.94)
	Total	2.74 (0.80)	3.06 (0.51)	2.00 (0.65)	1.79 (0.67)	2.48 (0.81)
Overweight	Females	3.06 (0.63)	3.34 (0.51)	3.07 (0.61)	2.87 (0.63)	3.50 (0.84)
	Males	2.90 (0.56)	2.97 (0.59)	1.71 (0.48)	1.36 (0.47)	2.50 (0.89)
	Total	3.00 (0.58)	3.23 (0.53)	2.57 (0.87)	2.32 (0.94)	3.14 (0.96)
Obese	Females	3.11 (0.91)	3.17 (0.63)	2.36 (0.83)	2.27 (0.89)	2.58 (0.79)
	Males	2.81 (0.52)	3.22 (0.36)	2.53 (0.60)	2.47 (0.64)	2.66 (0.66)
	Total	2.97 (0.75)	3.19 (0.51)	2.44 (0.72)	2.36 (0.78)	2.61 (0.72)

The general pattern of results was that the healthy weight range group had lower average scores across all DEBQ subscales than the obese and overweight

groups, and the overweight group had the highest average scores of all weight groups, with the exception of one scale, Emotional Clear. For all three weight groups, average scores were highest for the External Eating scale, that is, participants in all groups ate mostly in response to external cues. In addition, across all scales except one (Emotional Total), average scores were higher for female participants than male participants.

Table 3 shows the percentage of participants in each of the three weight groups with scores on the DEBQ scales $\geq$ 3.5, the score range that indicates eating behaviours that occur more than just sometimes (i.e. often or very often). The results support the overall pattern described above, that eating in response to external cues was prevalent across all three weight groups. Results further show that restrained eating was also common among participants in all weight groups, particularly those in the overweight and obese groups. Eating in response to emotional cues, overall, was less common in all groups, but was higher among overweight and obese people compared to the HWR participants. Specifically, eating in response to emotions that can be clearly labelled was highest among overweight and obese people. A greater number of overweight participants also ate in response to difficult to label (diffuse) emotions compared to the other two weight groups.

Table 3

Number of Participants in the Three Weight Groups (HWR, Overweight, and Obese) Who Scored ≥ 3.5 on DEBQ Subscales

	HWR	OW	OB
Restrained	42%	63%	53%
External	65%	70%	72%
Total Emotions	7%	28%	28%
Clear Emotions	5%	37%	28%
Diffuse Emotions	26%	72%	39%

The following section examines the results for each of the DEBQ subscales, comparing weight groups and the gender of participants separately.

Restrained eating. The means of restrained eating scores for the three weight groups are presented graphically in Figure 1. The results of a two-way ANOVA revealed a significant main effect for gender [$F(1, 71) = 4.41$, $p = .040$], with females reporting higher levels of restrained eating compared to males. The gender differences in restrained eating was most prominent in the HWR group, with Cohen's *d* calculations revealing a very large effect size ($d = 1.17$). Effect sizes for gender differences within the overweight and obese groups were small ($d = 0.26$) and moderately small (0.39), respectively. An example of a response for one item that illustrates the high restraint scores for women is that 48% of females reported they often or very often deliberately ate food that was slimming compared with only 8% of males.

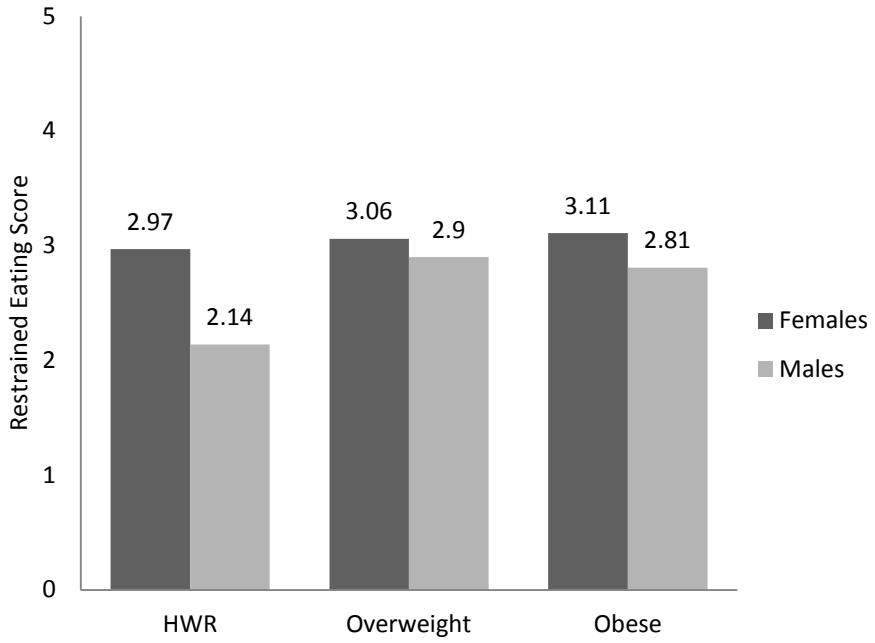

Figure 1. Means for restrained eating scores for the three weight groups (healthy weight range, overweight, obese)

The main effect for weight [$F(2, 71) = 2.60$, $p = .082$] and the Gender x Weight interaction [$F(2, 71) = 1.31$, $p = .276$] were not significant. Given the low sample sizes, effect sizes were calculated to determine the magnitude of differences. Large effect sizes were found between restraint scores of males in the HWR and overweight groups ($d = 0.94$), and between males in the HWR and obese groups ($d = .90$). Small to moderately small effect sizes were found for restrained eating scores between overweight and obese males, ($d = 0.17$), and for females between the three weight groups ($d = 0.06 – 0.19$). These results suggest that males of a healthy weight reported considerably less restrained eating compared to participants in the other five groups, who reported similar amounts of restrained eating.

External eating. The means of the external eating scores for each weight group are presented in Figure 2. A two-way ANOVA revealed no main effect for gender [$F(1, 71) = 1.45$, $p = .232$]. Cohen's *d* revealed a moderately large effect size between overweight males and females ($d = 0.69$), a moderate effect size between HWR males and females ($d = 0.47$), and a small effect size between obese males and females ($d = 0.09$).

A two-way ANOVA revealed no main effect for weight [$F(2, 71) = 0.94$, $p = .395$] and there was no interaction effect [$F(2, 71) = 1.78$, $p = .514$]. Calculation of Cohen's *d* revealed a large effect size between males in the HWR and obese groups ($d = 0.73$), a moderate effect size between overweight and obese males ($d = 0.57$), and a small effect size between HWR and overweight males ($d = 0.17$). These findings suggest that obese males more frequently eat in response to external triggers compared to HWR or overweight males.

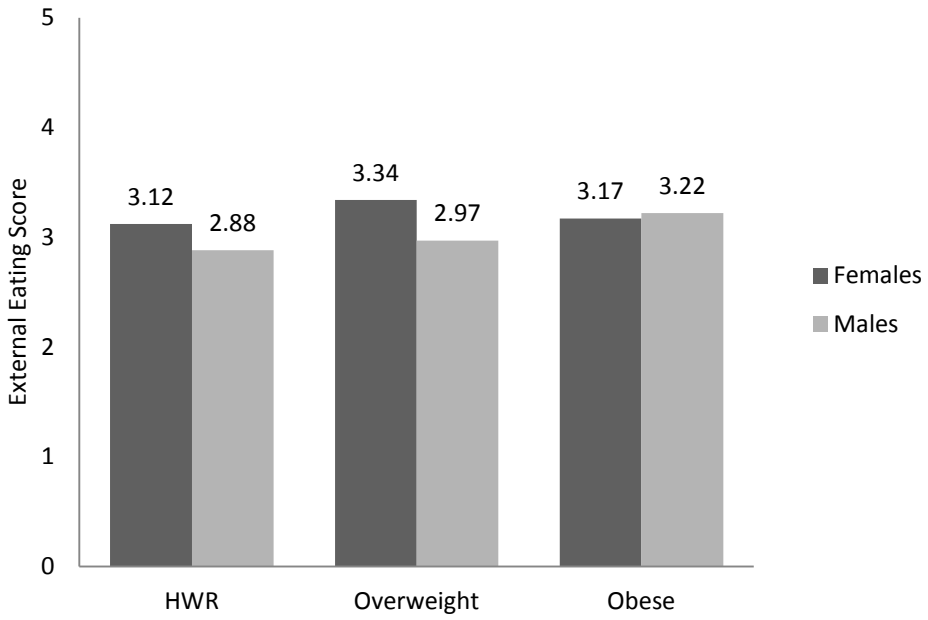

Figure 2. Means for external eating scores for the three weight groups (healthy weight range, overweight, obese)

A moderate effect size was found between females in the HWR and overweight groups (d = 0.44), a small to moderate effect size between overweight and obese females (d = 0.29) and a small effect size between HWR and obese females (d = 0.09). The above findings show that overweight females reported the highest amount of external eating and HWR and overweight males reported the lowest amount of external eating than the other groups.

Emotional eating. The mean scores for total, clear, and diffuse emotional eating for each of the three weight groups are presented in Figures 3a-3c. A two-way ANOVA for total emotional eating showed a significant main effect for weight [F(2, 71) = 6.01, p = .004] and gender [F(1, 71) = 11.01, p = .004], with females reporting more total emotional eating than males overall. Results of an item illustrating this

result is that no male participant reported they often or very often ate when cross, compared with 17% of female participants.

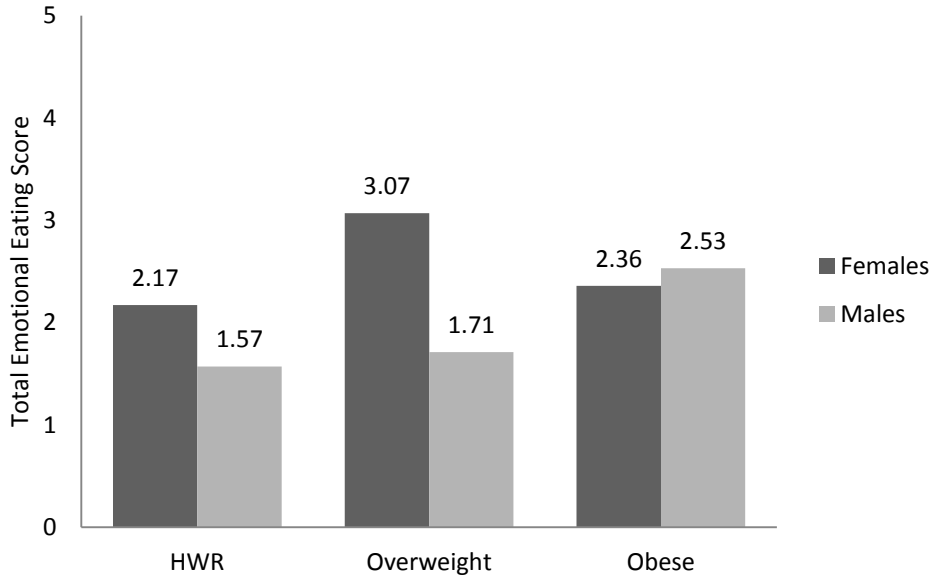

Figure 3a. Means for total emotional eating scores for the three weight groups (healthy weight range, overweight, obese)

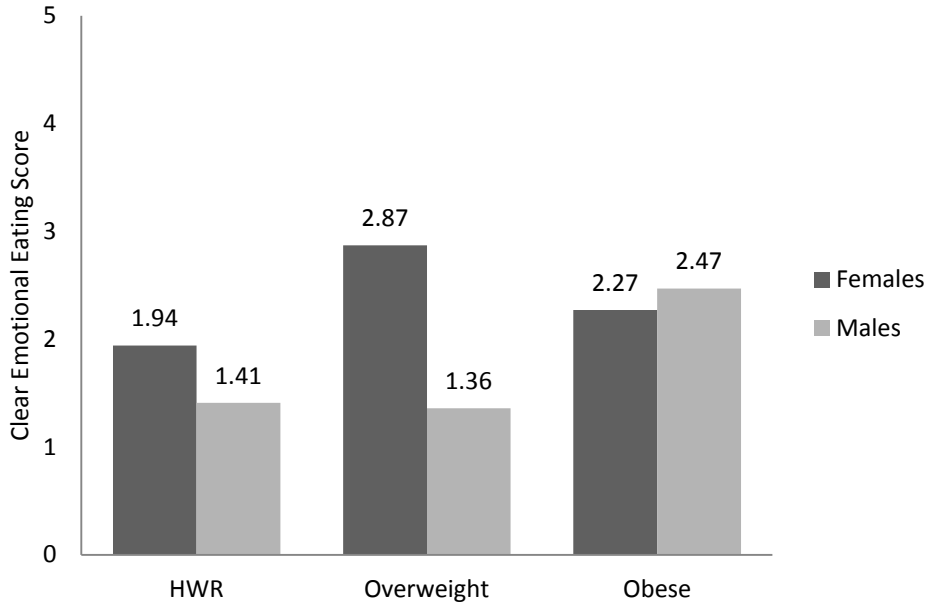

Figure 3b. Means for clear emotional eating scores for the three weight groups (healthy weight range, overweight, obese)

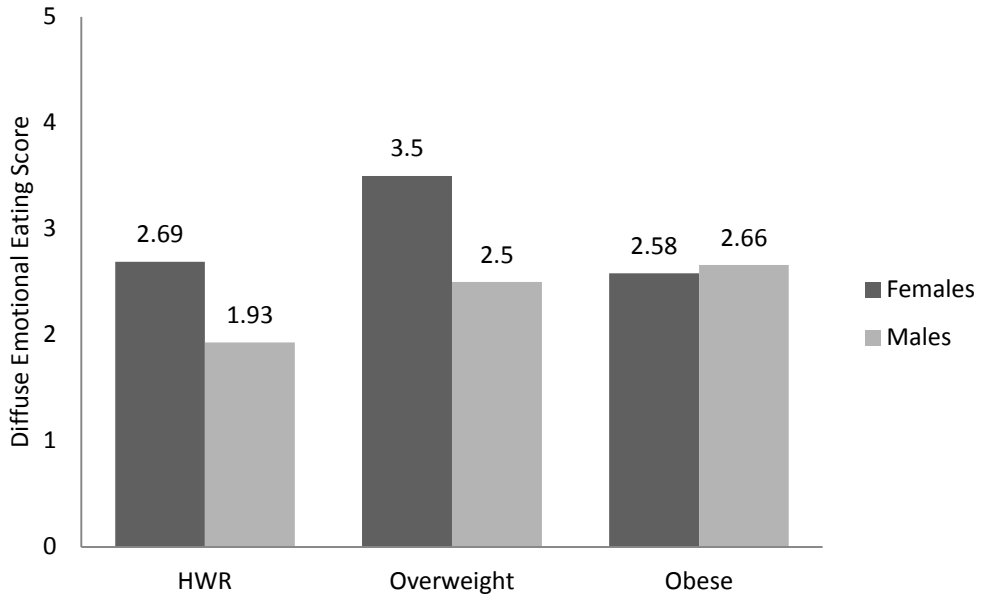

Figure 3c. *Means for diffuse emotional eating scores for the three weight groups (healthy weight range, overweight, obese)*

A significant interaction effect for total emotional eating was also found [$F(2, 71) = 4.96$, $p = .010$]. Results of Tukey's post-hoc analysis are presented in Table 4. Post hoc tests showed HWR participants ate significantly less often in response to emotional triggers compared to overweight and obese participants. Overall, there was no difference in the amount of total emotional eating between the obese and overweight groups.

Table 4

Tukey's Post Hoc Analysis for Total Emotional Eating Scores for the Three Weight Groups (HWR, Overweight, Obese)

		Differences in mean	Standard error	Significance
HWR	Overweight	-.570*	.213	.033
	Obese	-.432	.177	.057
Overweight	Obese	.138	.241	.850

Note: * $p < .05$

Similar to total emotional eating, a two-way ANOVA for clear emotional eating showed a significant main effect for weight [$F(2, 71) = 3.01$, $p = .002$] and a significant main effect for gender [$F(1, 71) = 4.62$, $p = .002$] with females reporting higher clear emotional eating scores compared with males. An interaction effect was also found [$F(2, 71) = 5.39$, $p = .007$].

Results of Tukey's post hoc analysis are presented in Table 5. Post hoc tests revealed HWR participants ate significantly less often in response to clear emotions compared with obese participants. There was no significant difference in clear emotional eating scores between the HWR and overweight groups or between the obese and overweight groups.

A two-way ANOVA for diffuse emotional eating showed a significant main effect for weight [F(2, 71) = 3.48, p = .037] and gender [F(1, 71) = 6.58, p = .013], with females reporting higher scores for diffuse emotional eating than males. No interaction effect was evident [F(2, 71) = 2.28, p = .110]. Tukey's post hoc analysis revealed overweight participants ate significantly more in response to diffuse emotions compared to participants in the HWR. No significant difference was found

Table 5

Tukey's Post Hoc Analyses for Clear Emotional Eating Scores for the Three Weight Groups (HWR, Overweight, Obese)

		Differences in mean	Standard error	Significance
HWR	Overweight	-.530	.226	.057
	Obese	-.565*	.188	.010
Overweight	Obese	.035	.256	.990

Note: * $p < .05$

for diffuse emotional eating scores between the HWR and obese groups or between the obese and overweight groups. Tukey's post hoc results are presented in Table 6.

Table 6

Tukey's Post Hoc Analyses for Diffuse Emotional Eating Scores for the Three Weight Groups (HWR, Overweight, Obese)

		Differences in mean	Standard error	Significance
HWR	Overweight	-.570*	.213	.025
	Obese	-.432*	.177	.044
Overweight	Obese	.138	.241	.836

Note: * $p < .05$

Given the small and uneven sample sizes, to determine the magnitude of differences, effect sizes were calculated for gender and weight groups across the three emotional eating subscales. Large to very large effect sizes were found between males and females in the HWR group ($d = 0.84 – 1.02$) and between males and females in the overweight group ($d = 1.17 – 2.60$). For the HWR and overweight groups, in all three emotional eating subscales females reported higher emotional eating than males. No differences were evident between the emotional eating of obese males and females, with small effect sizes observed ($d = 0.11 – 0.25$).

Small effect sizes were found for total and clear emotional eating scores between HWR males and overweight males ($d = 0.22$ and 0.08, respectively). A moderate effect size was found for diffuse emotional eating scores between HWR and overweight males ($d = 0.61$). Very large effect sizes were observed for total and clear emotional eating scores between overweight and obese males ($d = 0.95 – 1.87$), with obese males reporting higher total and clear emotional eating than overweight males.

There was no difference, however, between the amount of diffuse emotional eating between overweight and obese males, with a small effect size observed (d = 0.22).

In contrast to males, large to very large effect sizes were found between overweight and HWR females (d = 1.17 – 1.58) and overweight and obese females (d = 0.75 – 1.45), for all emotional eating scores with overweight females reporting the highest amount of total, clear, and diffuse emotional eating. No differences were found in the amount of total emotional eating or diffuse emotional eating between HWR and obese females, with small effect sizes reported (d = 0.30 and 0.16, respectively).

The above results show that overweight females reported the highest amount of total, clear, and diffuse emotional eating than the other five groups. Obese males and females, and HWR females reported the second highest amount of total and clear emotional eating. Males in the HWR and overweight groups reported the least amount of total and clear emotional eating. HWR females, overweight males, and obese males and females reported the second highest amount of eating in response to diffuse emotions. Similar to total and emotional eating scores, HWR males also reported the lowest amount of eating in response to diffuse emotions.

Absolute score values. The results that have been reported so far relate to differences in scores on the DEBQ subscales between gender and weight groups. It is also important to consider the absolute score values. Restrained eating was common amongst most participants, except for males of a healthy weight. Eating in response to external cues was common among all weight groups. Overall, participants ate in response to emotions less often than in response to external triggers. Eating in response to a clear emotion was less common than eating due to a diffuse emotion. Nevertheless, diffuse emotional eating scores were also relatively low, except among

overweight females who, on average, reported they often or very often ate in response to difficult to label emotions.

DEBQ subscale correlations. Many studies have found restrained eating, external eating, and emotional eating to be interrelated (Rodin, 1975; Slochower, 1983; Slochower et al., 1981). To identify relationships between scores on the various DEBQ subscales, Pearson correlations were calculated for each of the subscales and across each of the three weight groups. These data are presented in Table 7.

There were significant positive correlations between the emotional (total), emotional (clear), and emotional (diffuse) scales for the HWR group (r = .612 - .953), overweight group (r = .649 - .966), and obese group (r = .763 - .980). Correlations between restraint and external eating for the HWR group (r = .169, n = 43, p = .277), overweight group (r = -.311, n = 10, p = .382), and obese group (r = .223, n = 17, p = .389, two-tails) were not significant. These data indicate that among these participants, restrained eating and external eating were not associated.

Table 7

Correlation Coefficients for the Five Subscales on the DEBQ

		External	Emotional (total)	Emotional (clear)	Emotional (diffuse)
HWR	Restrained	.169	.366*	.368*	.266
	External		.359*	.227	.511*
	Emotional (total)			.953**	.823**
	Emotional (clear)				.612**
Overweight	Restrained	-3.11	-.201	-.183	-.189
	External		.349	.456	-.054
	Emotional (total)			.966*	.823**
	Emotional (clear)				.649*
Obese	Restrained	.223	.571*	.544*	.546*
	External		.359	.402	.193
	Emotional (total)			.980**	.876**
	Emotional (clear)				.763**

Notes: * p <.05 level (2-tailed)
** p <.01 level (2-tailed)

Different findings were observed for the relationship between restrained and emotional eating for the different weight groups and the type of emotional eating subscale. For the obese group there was a significant positive relationship between restraint and all three emotional subscales (emotional total: r = .571, n = 17, p = .017, emotional clear: r = .544, n = 17, p = .024, emotional diffuse: r = .546, n = 17, p = .023, two tails), suggesting that obese participants who restrained their eating were susceptible to eating in response to all emotional triggers. For the HWR group, a significant positive correlation was also found between restrained and emotional total (r = .366, n = 43, p = .016, two tails), and restrained and emotional clear (r = .368, n = 43, p = .015, two tails). No relationship, however, was found between restraint and emotional diffuse (r = .266, n = 43, p = .085, two tails). These findings suggest that HWR participants who restrained their eating were susceptible to eating in response to emotions that are easily identifiable, but not in response to emotions that are difficult to label.

The overweight group was quite different to the other weight groups as no significant relationship was found between restraint and any of the emotional subscales (emotional total: r = -2.01, n = 11, p =.554, emotional clear: r = -.183, n = 11, p = .589, emotional diffuse: r = -.189, n = 11, p = .577, two tails). These findings suggest that among overweight participants, restrained eating was not associated with any type of emotional eating.

Different patterns were also observed for the relationship between external and emotional eating across each of the weight groups. Within the HWR, a significant positive relationship was found between external eating and emotional total (r = .359, n = 43, p = .018), and external and emotional diffuse (r = .511, n = 43, p < .001, two tails). Therefore, HWR participants who ate in response to external triggers were also

susceptible to eating in response to difficult to label emotions, but not in response to clear emotions.

Within the obese group, external eating was not correlated with any emotional eating subscales (total: r = .359, n = 18, p > .143, clear: r = +.402, n = 18, p = .098, diffuse: r = .193, n = 18, p = .443, two tails). Likewise, within the overweight group there was no significant correlations between external eating and emotional total (r = .349, n = 10, p = .322), emotional clear (r = .456, n = 10, p = .186), or emotional diffuse (r = -.054, n = 10, p = .883), two tails. Therefore, there was no association between restrained eating and external eating for the obese or overweight groups.

The second questionnaire requested information that either extended on the subscales of the DEBQ (restrained, external, and emotional eating) or explored additional topics relating to antecedents and cues of non-hungry eating and overeating. The majority of questions required responses on a 5-point scale, ranging from 1 (never) to 5 (very often). Unless otherwise stated, the following sections will use the term “rarely” to describe the combined response categories of “never” and “seldom”, and the term “frequently” to describe the combined response categories of “often” and “very often”.

Non-Hungry Eating

Non-hungry eating (NHE) was assessed in two ways. After an initial description of the definition of NHE, the participants were provided with a 13 cm line anchored at the ends with 0% and 100%, with markers placed at 25% intervals along the scale. Participants placed a mark on the line that represented the percentage of their eating during a typical day that they believed was triggered by factors other than physical hunger. In addition, participants responded to four questions related to eating in response to physical hunger or to avoid hunger (Do you wait until you are hungry

to eat? Do you eat to avoid the feelings of: a) having an empty stomach, b) low energy levels, c) other sensations of hunger?). Responses ranged from “never” to “very often” on a five point scale of 1 – 5.

Percentage of NHE. Means and standard deviations for percentages of NHE are presented in Appendix C. A two-way (3 x 2) ANOVA was undertaken to compare differences in NHE percentages across weight groups and gender. The results indicated that there were significant main effects for both weight [$F(2, 72) = 3.73$, $p = .029$] and gender [$F(1, 72) = 5.88$, $p = .018$], with females reporting a higher percentage of NHE ($M = 43.4\%$) than males ($M = 30.4\%$). The interaction effect was not significant [$F(2, 72) = 0.69$, $p = .504$], indicating that across all weight groups, females had higher NHE percentages than males. Tukey’s post hoc analyses revealed that differences between NHE percentages in the three weight groups were not significant. Average NHE percentages for the three weight groups are presented separately for male and female participants in Figure 4.

With the small and uneven sample sizes of the three weight groups, it is possible that this non-significance was a result of low statistical power. Effect sizes were therefore calculated to avoid making any type 2 errors. Moderately low to moderate effect sizes were found for between males and females within the HWR and obese groups ($d = 0.39$ and 0.46, respectively), and a very large effect size was found between males and females within the overweight group ($d = 1.09$). Females reported higher percentage of NHE across all weight groups.

Overweight females reported more NHE than HWR females ($d = 1.14$) and obese females ($d = 0.30$), with large and moderately low effect sizes reported, respectively. A large effect size was also observed for NHE scores between HWR and obese females ($d = 0.76$).

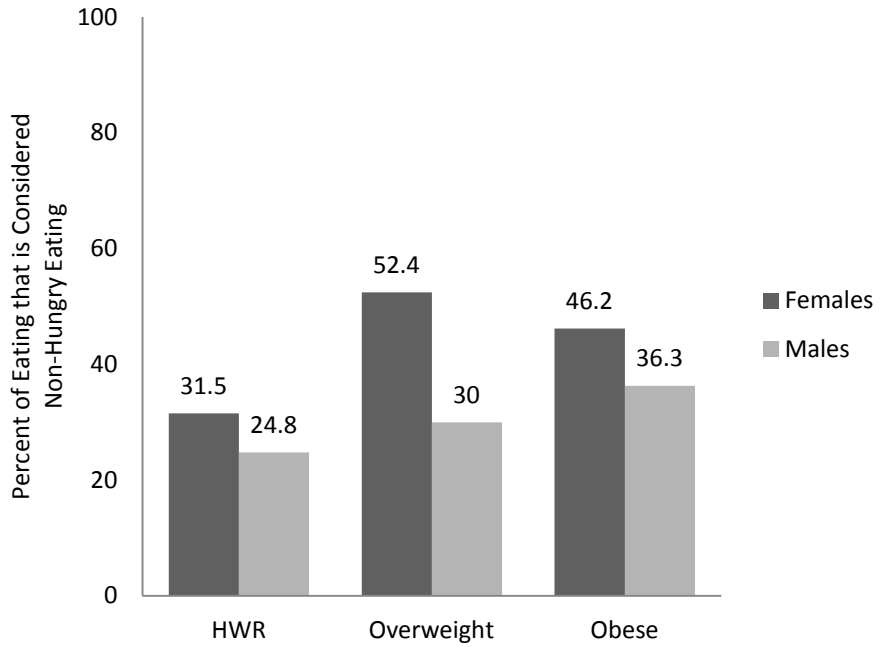

Figure 4. The mean percentage of non-hungry eating for male and female participants separately in the three weight groups

Males in the HWR reported the lowest amount of NHE compared to overweight males and obese males. A small effect size was found between NHE percentages of HWR and overweight males (d = 0.32) and between overweight and obese males (d = 0.28). A large effect size, however, was found between NHE scores of HWR and obese males (d = 0.70). The above findings show that, of the six groups, overweight females engage in the most amount of NHE and HWR and overweight males engage in the least amount of NHE.

Hungry eating. Most (55%) overweight participants reported that they rarely waited until they were hungry before eating, compared to almost 40% of obese people and only 20% of people in the HWR. Consistent with the high percentage of NHE reported by overweight participants, no overweight participant reported they frequently waited until they were hungry before eating. Participants were provided with an opportunity to include additional comments, which elaborated on their hungry

eating or non-hungry eating. An obese male participant wrote: “I usually eat when I don’t feel full as oppose to hunger pangs or feeling physically hungry.” Another similar comment was written by an overweight female participant: “There are times when all my eating is non-hungry, for months at a time.” In contrast, a female HWR participant noted: “I only eat when I’m not hungry if there’s something that I really like that’s available that I don’t have very often.” Overall, equal numbers of males and females (25%) frequently waited until they were hungry to eat. The response frequencies are presented in Table 8.

Table 8

Response Frequencies to the Question “Do You Wait Until You Are Hungry to Eat?”

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	2	7	21	11	2	43
	Overweight	2	4	5	0	0	11
	Obese	0	7	6	4	1	18
Gender	Females	1	12	23	9	3	48
	Males	3	6	9	6	0	24
Total		4	18	32	15	3	72

Eating to avoid hunger. The following three questions relate to eating to avoid future physiological sensations of hunger. The response frequencies are presented in Tables 9 - 11.

Eating to avoid having an empty stomach was an important consideration for many overweight people, with 45% reporting that they frequently ate for this reason. Only 9% of overweight people reported that they rarely ate to avoid having an empty stomach, compared to 26% of people in the HWR. Among obese participants, eating to avoid an empty stomach was not a factor in food consumption, with 39% of obese people reporting that they rarely eat for this reason and only 17% indicating they frequently eat to avoid an empty stomach. For example, an obese female participant

Table 9

Response Frequencies to the Question "Do You Eat to Avoid the Feelings of Having an Empty Stomach?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	6	5	16	14	2	43
	Overweight	1	0	5	4	1	11
	Obese	1	6	8	2	1	18
Gender	Females	4	6	19	15	4	48
	Males	4	5	10	5	0	24
Total		8	11	29	20	4	72

wrote: "It's rare for me to feel like I have an empty stomach." Almost twice as many females than males reported that they frequently ate to avoid the feelings of having an empty stomach (40% against 21%). For example, one female wrote "I eat at least five times a day to avoid hunger."

Table 10

Response Frequencies to the Question "Do You Eat to Avoid the Feelings of Low Energy Levels?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	3	5	10	22	3	43
	Overweight	2	1	4	4	0	11
	Obese	3	7	4	4	0	18
Gender	Females	4	7	12	22	3	48
	Males	4	6	6	8	0	24
Total		8	13	18	30	3	72

Most (58%) HWR participants frequently ate to avoid low energy levels, whereas most (55%) obese people rarely ate for this reason. Overweight participants were quite evenly spread with 27% reporting they rarely ate to avoid low energy levels and 36% frequently eating for this reason. Females frequently ate to avoid the

feelings of low energy with one in two (51%) eating for this reason compared to one in three males (33%).

Within the three weight groups there were varied responses to the question of eating to avoid other sensations of hunger. Almost one in five (18%) overweight participants rarely ate to avoid other sensations of hunger, however 18% frequently ate for this reason. There was a similar pattern among the obese group with 28% never or seldom and 32% often or very often eating to avoid other hunger sensations. More males (38%) frequently ate to avoid other sensations of hunger compared to females (29%).

Table 11

Response Frequencies to the Question "Do You Eat to Avoid the Feelings of Other Sensations of Hunger?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	3	6	17	15	2	43
	Overweight	1	1	7	2	0	11
	Obese	1	4	9	3	1	18
Gender	Females	3	6	25	11	3	48
	Males	2	5	8	9	0	24
Total		5	11	33	20	3	72

Desire to Lose Weight

Information on a person's desire to lose weight can provide important underlying information on eating behaviour and weight loss such as readiness to change, locus of control, internal and external sources of motivation, body dissatisfaction, and restraint.

Desire to lose weight was assessed through three questions on a five point scale (the same as the scale used on the DEBQ). Participants were asked "Over the past six months, have you wanted to: a) lose weight, b) lose weight for yourself, and

c) lose weight for your family / partner?" Response frequencies are presented in Tables 12 – 14.

Although obese and overweight participants wanted to lose weight, this was particularly important for the overweight participants, with 91% indicating that over the past six months they had frequently wanted to lose weight, compared to 67% of obese people. An obese female participant even noted that she was "taking leave from work to increase exercise ability." In contrast, another obese female wrote "I enjoy good food too much to bother with willpower." Although they are classified as having a healthy weight, more than half (51%) of HWR participants reported over the past six months they had frequently wanted to lose weight.

Table 12

Response Frequencies for the Question "Over the Past Six Months Have You Wanted to Lose Weight?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	8	5	8	15	7	43
	Overweight	0	1	0	2	8	11
	Obese	0	1	5	4	8	18
Gender	Females	2	3	10	14	19	48
	Males	6	4	3	7	4	24
Total		8	7	13	21	23	72

Across all weight groups, more females (69%) than males (46%) frequently wanted to lose weight. In many cases participants noted that weight loss was extremely difficult. For example, an overweight female participant commented that she been dieting on and off for around 10 years. An overweight male noted similar difficulties: "I have been following slimming diets previously with good results. Unfortunately the kilos come back as soon as I am on my own."

Table 13

Response Frequencies for the Question "Over the Past Six Months Have You Wanted to Lose Weight for Yourself?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	8	3	8	15	9	43
	Overweight	0	1	0	1	9	11
	Obese	0	0	5	5	8	18
Gender	Females	2	1	10	13	22	48
	Males	6	3	3	8	4	24
Total		8	4	13	21	26	72

Overall, a similar number of people who wanted to lose weight (61%) stated that they would like to lose the weight for themselves (65%). Only a small number of HWR participants had frequently wanted to lose weight for their family / partner (14%) compared to overweight (36%) and obese participants (44%).

Table 14

Response frequencies for the question "Over the Past Six Months Have You Wanted to Lose \Weight for Your Family/Partner?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	22	7	7	4	2	42
	Overweight	2	2	3	1	3	11
	Obese	2	3	5	3	5	18
Gender	Females	16	9	11	5	7	48
	Males	10	3	4	3	3	23
Total		26	12	15	8	10	71

Counterregulation

According to restraint theory, the more that people attempt to restrict the type and amount of food they consume in order to lose weight, the more likely they will overeat when the restrictive dieting patterns are broken. This is termed counterregulation. Counterregulatory behaviour was explored with the question "If

you break an eating pattern that you would like to maintain (i.e., a diet) are you further inclined to eat more unhealthy food?" The response code was similar to that used for other items on the DEBQ. Frequency data are presented in Appendix D.

Overall, overeating after breaking a diet was relatively uncommon, with only 11% of the total participants reporting that they frequently overate after breaking a diet. Nevertheless, almost one in five overweight participants (18%) frequently overate after breaking a diet compared to 11% of obese participants and 9% of HWR participants. The concept of counterregulation was noted by an obese female participant who wrote "I don't think it's good to forbid yourself certain foods, it only makes you crave them more."

A Pearson correlation analysis was undertaken to investigate the relationship between the restraint subscale of the DEBQ and response to the above question regarding counterregulation. This analysis was undertaken on the basis of research suggesting a causal effect of restraint on overeating. No significant relationship was found (r = .20, n = 71, p = .094, two tails).

External Eating

External triggers from a bakery or snack-bar / cafe. In addition to items on the DEBQ, five questions were included in the second questionnaire to further explore eating that is triggered by external cues. Two questions directly extended on two items on the DEBQ. The two DEBQ items were "If you walk past the baker, do you have the desire to buy something delicious?" and "If you walk past a snack-bar or café, do you have the desire to buy something delicious?" To assess respondents' behaviour after walking past a bakery or snack-bar / café, rather than assessing only the desire to eat, an additional question that followed these two items asked, "Do you actually buy it?" Response frequencies are provided in Appendix E and F.

Although the percentages were quite low, more overweight participants frequently bought food after walking past a bakery (9%) or snack-bar / café (9%) compared to obese (6% and 8% respectively) and HWR participants (5% and 0% respectively). Overall, more females responded to environmental cues with 8% reporting they frequently bought food after passing a bakery and 6% after passing a snack-bar / café.

Social cues. An additional question was included in the second questionnaire to explore whether eating behaviour changes during social eating situations compared with eating alone. Appendix G shows response frequencies for the question "When you are eating with others, how much food do you eat compared to when you are eating alone?"

Most participants did not alter the quantity of food they ate while eating with others. No participant reported that they frequently ate much less food than usual when with others, however 36% of overweight participants frequently ate much more food when eating with others compared to only 5% of obese and 0% of HWR participants. An overweight male wrote about his difficulties in eating healthily when in social situations: "I normally eat healthy meals, however when I go out to restaurants and parties I cannot control myself as far as eating goes." Although the percentages are relatively small, almost double the proportion of women (13%, $n = 3$) frequently ate much more during social situations compared to men (7%, $n = 3$).

Additional comments provided by participants revealed social norms may also influence eating behaviour, with an obese female participant noting "I will often eat out of politeness or pressure, but I am getting better at saying 'no' when a workmate tries to force me to eat cake." The same participant also wrote "My boyfriend always wants me to have dessert so he can have some of mine. I never really liked desserts.

With him, I eat more because I have another course. I try to only do it if I am not too full, but sometimes I care for him." In addition, seeing other people eat was also found to influence physiological sensations of hunger for a HWR female who wrote "Sometimes I am so busy I forget how hungry I am until I see others eating."

Additional comments suggested that being alone was also a trigger for eating. For example, an overweight female participant wrote "At times, any time alone has been an excuse for eating. As long as I can remember I've had a strong desire for sweet foods and secretly overate them from about 11 or 12 years of age." Food was also deemed an important social occasion for many participants. For example, an obese female participant wrote "Food / eating out is a hobby or a passion, a social event."

Visibility of food. When food is frequently visible throughout the day, thoughts of food and eating may become more salient and NHE can result. Participants were asked "Throughout the course of a typical day (at home and / or at work), do you usually find that food is visible: a) only at meal times, b) at meal times and some other times, or c) frequently throughout the day?" Response frequencies are presented in Appendix H.

More HWR participants (40%) frequently had food visible throughout the day than overweight (27%) and obese participants (22%). Many more females (42%) frequently had food visible during the day compared to men (17%). The effect of having food visible during the day was noted by a HWR female, who wrote "If lollies and chocolates are visible at work it is very hard to resist myself. I don't buy biscuits, chocolates, or lollies at home because if they're not there then I won't be tempted."

Predetermined meal times. The reliance on the time of day in determining eating behaviour was not investigated in the DEBQ. A question was therefore

included that asked “Do you eat at pre-determined times of the day (e.g., lunch at 12.30pm)?” A five point response code identical to the DEBQ code was used. Response frequencies are provided in Appendix I.

Almost twice as many overweight participants (64%) reported they frequently ate at pre-determined times of the day than those in the HWR (33%). Forty-four percent of obese participants frequently relied on time as a factor to determine eating behaviour.

Emotional Eating (Positive Emotions)

As the DEBQ only assesses emotional eating in response to negative affect, three additional questions were included to achieve a more representative perspective of emotional eating. The three questions were: “Do you have the desire to eat when (a) you are happy, (b) you are relaxed, (c) you are excited?” Each question was scored on a five-point scale identical to the DEBQ. Response frequencies are provided in Appendix J – L.

A greater proportion of overweight participants reported that they frequently wanted to eat when happy (27%) or excited (18%) than any other group. Sixteen percent of HWR participants were frequently motivated to eat when happy and 5% when excited. Only a small number of obese participants frequently had the desire to eat when happy (11%) and no obese participant had the desire to eat when excited (0%). For example, an obese female participant wrote “There is a definite sense of self-justification in the amount and type of food I eat in response to emotions. The emotions are usually negative so the choice of food is often “junk” or “treat”. Nevertheless, a high number of obese participants frequently desired food when relaxed (39%), compared to overweight (27%) and HWR (12%) participants. More females were frequently motivated to eat when happy (21%) and relaxed (15%)

compared to males (8% and 8%), however, twice as many males (8%) than females (4%) frequently desired food when excited.

Affect After Overeating

Emotional reactions after one has overeaten have been shown to have an influence over dichotomous "all-or-nothing" approach to dieting, restrained eating, and future eating behaviour. Participants' mood after they have overeaten was assessed through the question "When you have eaten too much, do you usually feel (a) guilty, (b) ashamed, (c) disgusted, (d) satisfied, (e) relaxed, (f) relieved, (g) in high spirits, or (h) numb?" Participants were asked to identify any of the emotions that they commonly experienced by ticking all relevant boxes. Response frequencies are shown in Appendix M.

Overall, the most common emotions that were experienced after overeating were guilt and satisfaction, with 49% and 35% of all participants frequently experiencing these emotions, respectively. Overweight participants reported more negative emotions and less positive emotions after overeating than the other groups. Almost three-quarters (73%) of overweight participants frequently felt guilty after overeating. Despite having a healthy weight, almost half (49%) of HWR participants frequently experienced guilt after overeating. A female HWR participant used the negative emotions she usually experienced after eating to discourage her from eating unhealthy food: "I avoid eating foods that look, smell, or taste good if I know I am going to feel bad afterwards." Of the three weight groups, obese participants reported the lowest amount of guilt (33%) after overindulging in food. More overweight (18%) and obese (17%) participants frequently felt ashamed after overeating compared to HWR participants (7%). A greater proportion of overweight participants (27%) reported that they frequently felt disgusted after overindulging than obese (22%) and

HWR participants (21%). Overweight participants reported the lowest amount of satisfaction (18%) compared to HWR (35%) and obese participants (44%). Approximately double the number of HWR participants (21%) reported frequently feeling relaxed after overeating than obese (12%) and overweight participants (9%). No obese or HWR participant reported feeling in high spirits after indulging, compared to 11% of obese participants. Only one participant (HWR female) reported frequently feeling relieved and no participant reported feeling numb after overeating.

A larger number of females than males frequently experienced negative emotions after overeating, whereas more males than females frequently experienced positive emotions after overeating. More females than males reported that they frequently felt guilty (65% versus 17%), ashamed (15% versus 4%), and disgusted (31% versus 4%), whereas a greater number of males than females reported that they frequently felt satisfied (46% versus 29%) and relaxed (42% versus 8%). Only 4% of females and 2% of males reported frequently feeling in high spirits after overeating.

Attributions for Weight Gain

Excess weight can be attributed to either internal sources (events within the control of the individual, such as willpower, lifestyle, etc) or external sources (events outside of the control of the individual, such as genetics, luck, fate, etc). How people attribute excess weight may influence their perceived control over their weight or the extent of self-blame for weight gain, or any failures at weight loss attempts. These attributes may ultimately influence the initiation or outcome of any weight loss attempts. Three questions assessed how participants attributed excess body weight. On a five point scale ranging from never to very often, participants were asked “To what extent do you believe that excess body weight is caused by (a) a lack of

willpower, (b) genetics, and (c) luck, chance, or fate?" Response frequencies are provided in Appendix N – P.

Overall, most participants (69%) believed that a lack of willpower was the main reason for excess weight gain. Genetics was the second most common reason (33%), and luck, chance or fate was the least cited reason for weight gain (7%). All overweight participants believed weight gain was attributable to a lack of willpower, compared to 65% of HWR and 61% of obese participants. The overweight group was least likely to blame genetics (18%) compared to the obese (33%) and HWR groups (40%), whereas obese participants (22%) were much more likely to attribute excess weight to luck, chance, or fate than HWR (2%) and overweight participants (0%). One HWR female participant appeared to be unaware of the complexities of eating behaviour with her statement "Weight gain is usually because too much in and not enough exercise – simple maths!!!" A similar comment was written by an overweight female participant: "You control your own eating habits and what goes in to your mouth." In contrast, an obese female participant wrote "Dieting and weight are complex and difficult to come to a firm conclusion about." A comment from an overweight female participant also suggested an awareness of the complexities of eating behaviour and weight loss: "I believe dieting is a complex issue which is influenced by multiple factors including social, personal, nutritional, heredity, mood, etc. However, basically it boils down to move more and eat less – not always easy, though!"

Experiences of Weight and Food

Previous experiences of food and weight are perceived as principal aspects of most psychological theories of eating behaviour. Five questions addressed previous experiences in childhood such as excessive weight or eating disorders within their

family, dieting history, whether participants were provided with food as a reward, as an incentive, or to soothe pain, and the extent to which tasty and unhealthy food was denied. Responses were on a five-point scale. Response frequencies are shown in Appendix Q-U.

A much higher proportion (44%) of obese participants reported that in the past their family members were frequently overweight, compared to the overweight (20%) and HWR groups (14%). Six percent of obese participants reported an eating disorder within their family compared to 2% of HWR participants. Three times as many (18%) overweight participants reported an eating disorder in their family compared to the obese group.

More overweight participants (82%) reported that in the past they were frequently conscious of the type or amount of food they ate than HWR participants (63%) and obese participants (56%). Food was frequently used as a reward or to soothe pain for more than double the number of overweight (36%) compared to obese (17%) participants. For example, an overweight female participant noted “We had a very stressful job so we compensated by eating chocolate, lollies, anything really.” Food was very rarely used (2%) as a reward or to soothe pain within the HWR group.

Twenty-two percent of obese and 17% of HWR participants were frequently denied tasty and unhealthy food, however, no overweight participant was frequently denied appetising food because it was unhealthy. Across all weight groups, more females than males reported they had previously been conscious about the type and amount of food they consumed (73% vs 43%), and frequently had been denied tasty food because it was unhealthy (21% vs 4%). A female participant in the HWR group wrote how denial of tasty food would cause her to overeat: “As children we never had sweet biscuits in the house, so when they were available I ate the whole packet.”. In

addition, more females than males reported they were frequently given food as a reward or to soothe pain (15% vs 4%).

Location of Eating

The location where food is consumed is an important factor that may directly or indirectly influence NHE and overeating (Kausman, 2004). For example, specific locations may assist in forming associations and habits (e.g., a person who frequently consumes food while sitting on a their couch might be more likely to automatically think of food when sitting on their couch to watch television). In addition, the location where food is consumed may indicate the speed of eating and one's level of awareness of sensations associated with satiety. For example, people who consume food while standing in the kitchen may be more likely to eat quicker and be less likely to be aware of the quantity of food they are consuming than if they had served the food onto a plate, and consumed the food while seated at a table, free from extra immediately accessible food (Kausman, 2004).

Participants ranked locations where they frequently consumed food in order from most common to least common. Among all weight groups, seated at the kitchen or dining room table was the most common location, with 68% of obese, 63% of HWR, and 46% of overweight participants ranking the kitchen or dining room table as the place where they most frequently consumed food. More than two-thirds (36%) of overweight participants ranked sitting on the couch as the most common place they consumed food, compared with 23% of HWR and 17% of obese participants. Standing in the kitchen was also a popular place to consume food among overweight and obese participants. Thirty-six percent of overweight participants and 33% of obese participants ranked standing in the kitchen as the second most common place where they consumed food, compared to 19% of HWR participants.

Specific Eating Characteristics

Three questions assessed how quickly participants ate, frequency of binge eating, and eating after waking during the night. Each question was scored on a five-point scale similar to the DEBQ. Response frequencies are provided in Appendix V – X.

More overweight (64%) and obese (61%) participants reported that they frequently ate quickly than HWR (35%). Although binge eating was not common among any weight group, 6% of obese participants frequently binged compared to no overweight or HWR participant. Consuming food after waking during the night also was not common behaviour, however 22% of obese participants reported sometimes eating after waking compared to no overweight or HWR participant. Females and males reported similar speeds of eating, and similar frequencies of binge eating, and eating after waking.

Textual Responses

Textual responses for the questions exploring habit eating and current eating patterns were analysed. No distinctive patterns between the weight or gender groups were observed. An in-depth analysis of these responses has therefore been excluded from the report.

Discussion

The following information includes an overall summary and discussion of the patterns of eating behaviour reported by males and females within each of the three weight groups (healthy weight, overweight, obese) from the results of Study 1. Gender comparisons between and within the three weight groups for the variables on the DEBQ (restrained eating, external eating, and total/clear/diffuse emotional eating) and non-hungry eating percentage scores are also discussed. Other eating behaviour

variables are compared between each weight group, and possible explanations for the observed patterns are provided. An in-depth discussion of the implications of these results for the assessment and prevention of obesity, the limitations of the research, and the implications for future research are provided at the conclusion of Study 2.

Participants in the Healthy Weight Range

Males (HWR males). Males of a healthy weight rarely engage in non-hungry eating (NHE). HWR males predominantly use physiological sensations of hunger and satiety to determine food intake, with an average of only one in five eating bouts triggered by factors other than hunger.

HWR males rarely eat in response to negative emotions, whether they are clear or diffuse emotions (i.e., difficult to label). Although HWR males sometimes eat in response to external triggers, (such as having food visible during the day and eating at pre-determined meal times without considering hunger levels), the external eating is too infrequent to cause significant or consistent weight gain.

In addition, HWR males rarely attempt to restrain the type or amount of the food they consume. Previous research has found that people who do not impose strict dieting rules have fewer thoughts of food and eating and are less likely to overeat, experience negative emotions after overeating, or eat in response to internal and external cues and antecedents (Marlatt & Gordon, 1985; Ruderman, 1986; Wegner, 1994). Many of these studies, however, were conducted with overweight or obese participants.

Females (HWR females). Non-hungry eating was more common among females than males in the HWR group; a pattern that was also observed within the overweight and obese groups. Non-hungry eating scores among HWR females were not only higher than HWR males, but, with an average of almost one third of eating

undertaken by HWR females considered “non-hungry eating”, clearly a considerable amount of eating by HWR females is for reasons other than in response to physiological hunger. Two factors that featured predominantly in the eating behaviours of this group of females were eating in response to external cues such as the hedonic qualities of food (e.g., taste, smell) and the time of the day (e.g., eating because it is “lunchtime”) and in response to the experience of negative emotions (e.g., depression, anxiety).

HWR females engage in more emotional eating (incorporating clear and diffuse emotions) and eating in response to environmental triggers than is observed among HWR males. These patterns of emotional eating and external eating may relate to the higher levels of restrained eating by HWR females compared to HWR males. For example, because more HWR females restrict the type and amount of food that they eat in order to lose weight compared to HWR males, this restriction can eventually result in a greater susceptibility to eating to cope with negative emotions. The relationships between both emotional eating and external eating and restrained eating are discussed in greater detail below.

HWR females do not just restrain their eating more than HWR males, the absolute scores on the restrained eating subscale, that is, the extent to which they restrain their dietary intake, were relatively high (average restrained eating scores of 2.97 out of a possible score of 5). This finding indicates that many females of a healthy weight are actively trying to lose or maintain their weight through restricting the type and amount of food they consume. These results are consistent with Australian figures reported by Kenardy, Brown, and Vogt (2001) that state that almost 50% of HWR young women had dieted to lose weight in the preceding year.

Despite some dietary restraint and non-hungry eating, HWR females appear relatively immune to the overeating and weight gain that is commonly experienced after episodes of dieting (counter-regulation). Only 9% of HWR participants indicated that they are frequently inclined to overindulge in unhealthy food after breaking a diet.

Westenhoefer and colleagues (Westenhoefer, 1991; Westenhoefer, Stunkard, & Pudel, 1999) found that restrictive dieting only resulted in overeating and disinhibition (counter-regulation) if it was coupled with rigid dieting rules. The suggestion that HWR females are relatively immune from counter-regulatory behaviour may be because they do not catastrophise diet transgressions. For example, HWR females may take a more flexible approach to dieting, and may perceive breaking their diets as relatively insignificant occurrences. Overweight and obese females, however, are possibly more likely to perceive diet transgressions as catastrophic events. This perception can result in the "What the Hell Effect". These people often feel like a failure after breaking their diets, consequently use these feelings of failure to rationalise giving up their diets, and allow themselves to consume food *ad libitum*.

Overall, HWR females frequently eat in response to emotional and environmental triggers and, despite being a healthy weight, they often restrict their food intake. These moderate levels of internal, external, and restrained eating are similar to patterns observed in obese males and females. These levels of emotional eating among HWR females may have been caused by their dieting behaviours. Further analyses revealed that HWR participants who restrained their eating were susceptible to eating in response to negative emotions (clear emotions). Although causality can not be assumed based on this data alone, restraint literature has

suggested that dieting can have a significant influence on emotional eating (Herman & Polivy, 1991; Kausman, 2000; Polivy & Herman, 1999). Dieting as a causal factor in emotional eating is discussed in detail under the 'Participants in the Overweight Range" section of this discussion.

Despite the moderate levels of non-hungry eating (emotional and external eating) and levels of food restriction observed, this group were still able to maintain a healthy weight. This finding suggests that one can undertake a modest amount of non-hungry eating and still maintain a healthy weight, particularly if one stops when satiated rather than overeat. Overeating, however, was beyond the scope of this study and not included as a key variable, but inclusion in future studies may assist in determining the interrelationships of NHE and overeating. In addition, future studies may wish to explore the energy expenditure (e.g., physical activity) within the different groups that may compensate for NHE and overeating.

Healthy weight range participants overall pattern. Males and females of a healthy weight rarely had food used as a reward, as an incentive, or to soothe pain throughout childhood. These results are similar to those of other studies. Brink et al., (1999), for example, found 19% of people of a healthy weight reported that their families allocated rules regarding food and eating compared to 45% of obese participants. Rules regarding food and eating (e.g., all food on the plate must be consumed) can teach children to ignore feelings of hunger and satiety, and instead to rely on environmental cues. For example, a child may learn to eat past their feelings of satiation so they can eat all of the food on their plate and please their parents. This can result in an automatic behaviour, whereby the child does not even notice their satiation levels, and merely eats all of the food on their plate, contributing to overeating and future weight gain.

Overall, participants of a healthy weight sometimes were denied access to high- kilojoule, unhealthy food (e.g., chocolate, ice-cream, chips) but were not completely denied these tasty treats. This finding is congruent with restraint theory literature, which suggests that denying unhealthy food may result in feelings of deprivation and consequent future overeating / bingeing (counter-regulation) (Herman & Polivy, 1983). This finding indicates that to achieve a healthy weight as an adult, throughout childhood a "middle path" approach may be optimal, where unhealthy food should not be denied altogether, but also should not be eaten to excess.

A flexible approach to healthy eating, which is common among participants of a healthy weight, has been found to be a key factor in preventing counter-regulatory behaviour and possible associated weight gain (Westenhoefer, 1991; Westenhoefer et al., 1999). A middle path approach may lessen the likelihood of counter-regulation in several ways. For example, a more flexible "non-dieting" approach to healthy eating can reduce the moral labels that are often placed on food (e.g., "good", "bad", "junk", "rubbish"), a dichotomous all-or-nothing approach to dieting, negative affect after overeating, and the emotional eating that is associated with restrictive diets (Kausman, 2004).

Participants in the Overweight Range

Although the main purpose of this study was to compare the eating behaviours of people who are in the obese and healthy weight range BMI categories, inadvertently, questionnaires from people who had a BMI categorised as "overweight" were returned. These questionnaires were included in the analysis and have shown to be valuable in understanding the cues and antecedents that can contribute to weight gain and successful weight loss.

Overweight males. Overweight males typically reported a relatively low amount of non-hungry eating. Consistent with this finding, further results revealed that overweight males rarely eat in response to negative emotions (levels similar to HWR males) and are not particularly susceptible to eating following environmental triggers (e.g., social situations, time of the day). In addition, overweight males moderately restrain their eating in attempts to lose weight.

These results present a paradox because, despite the reported low levels of NHE, these males' excess weight suggest that their food intake is high relative to output. Perhaps overweight males may predominantly eat when physiologically hungry, but when they do consume food, their previously successful restraint on their food intake motivates them to take advantage of their diet transgressions and eat to excess rather than stopping when they experience satiety cues. This behaviour illustrates the What the Hell Effect, which is a common phenomenon when rigid dieters overeat after breaking restrictive diet rules (Herman & Polivy, 1983).

In support of the proposition that overweight males commonly overeat, additional findings from Study 1 suggest that overweight people often eat quickly, and therefore are more likely to feel full later in the eating bout than if they were to consume the food slowly. For overweight men, excess weight may be predominantly related to overeating (continuing to eat despite feeling satiated) rather than non-hungry eating (eating without physiological feelings of hunger). This hypothesis requires further investigation through future research.

Overweight females. Large differences are evident between the eating behaviours of overweight males and females. Overweight females have exceptionally high levels of non-hungry eating. Non-hungry eating is significantly more frequent for overweight females than any other weight / gender group, and is considerably higher

compared to overweight males. Overweight females are extremely susceptible to eating in response to triggers in the environment (e.g., social cues, predetermined meal times). In addition, they have a very high susceptibility to eating in response to negative emotions (both clear emotions and emotions that are difficult to label). Overweight females are much more likely to eat in response to environmental and emotional cues compared to any other weight / gender group.

Females who are overweight frequently restrict the type and/or amount of food they eat in attempts to lose weight. According to restraint theory, dieting may be a causal factor in their non-hungry eating, because restricting food often results in a greater susceptibility to eating in response to emotional and external triggers (Herman & Polivy, 1980; Schotte et al., 1990). When people begin to restrain their eating, thoughts of food often become more salient, and therefore they become more sensitive to cues and associations.

Despite an abundance of studies that support restraint theory, in this current study, overweight participants who restrained their eating were not more susceptible to eating in response to negative emotions or external cues than overweight participants who did not restrain their eating. The lack of association between restrained eating and emotional eating, and restrained eating and external eating on the DEBQ subscales for overweight participants may be explained by the low number of participants in this group (n = 11).

Overweight participants overall pattern. Overweight people often attribute their excess weight to a lack of willpower, rather than luck, chance, or fate. This finding suggests that people who are overweight perceive their weight to be within their control (the role of control and willpower in overeating is discussed at greater length in the section discussing obese males' and females' eating patterns). This

perception, however, may lead to self-blaming and negative emotions after eating, which can result in emotional eating. Consistent with this suggestion, overweight people often feel negative emotions after overeating, including guilt, shame, and disgust. These damaging emotions can result in a poor relationship with food, whereby one perceives food as the "enemy," paradoxically making thoughts of food and eating more salient, potentially triggering further non-hungry eating.

Although most of these findings are based on collective data for the overweight group and does not allow for within-group gender comparisons, the above findings suggest that many of these patterns may be represented by the overweight females rather than overweight males. For example, overweight females may begin with restricting their food intake (e.g., start a new diet, start skipping meals), which leaves them susceptible to emotional and external eating when they finally break their restrictive intake. Food eaten in response to emotional or environmental triggers is usually consumed rapidly, which can delay feelings of fullness (Maruyama et al., 2008; Smith & Hawks, 2006; Wansink, 2006). Overeating often results, which may trigger thoughts of guilt, shame, and disgust. In order to cope with these negative emotions, they may once again turn to food. When the eating bout finally stops, they begin another restriction period and the cycle starts again (Kausman, 2004).

Additional findings from this study show that, compared to the other weight groups, more overweight people have histories of eating disorders within their immediate and extended families (often mothers, sisters, or aunts). In these circumstances, role models often portray food and weight as enemies, with moral labels such as "junk" and "bad" placed on many food groups. Extreme dieting, bingeing, and body dissatisfaction often becomes normalised by other family members, who also learn to fear food and weight gain. Often, however, either through

the food restriction-overeating cycle or through rebelling against a family member's eating disorder, other people within the family may significantly overeat and gain weight.

Many of the overweight participants reported that food was used as a reward, as an incentive, or to soothe pain throughout their childhoods. Birth et al., (1980) found that people who were rewarded with food at an early age may be more prone to rewarding themselves with food as adults, and more likely to prefer the foods they were rewarded with as a child which were often high in fat, sugar, and kilojoules. These early experiences with food may have caused food, eating, and weight to become substantial issues for these people in adulthood and may have acquired underlying meanings such as a source of control, a source of love, one's identity, or a method of comfort.

In addition, no overweight participants reported that they were frequently denied access to eating unhealthy food throughout their childhoods. Having unrestricted access to unhealthy food may have promoted an overeating-style of eating behaviour. This finding is further evidence to support a "middle path" approach to healthy eating, whereby unhealthy food is not completely restricted, yet also is not eaten to excess.

Overweight people often eat while standing in the kitchen and/or while sitting on the couch, and are more frequently prone to eating after waking during the night than people in the lower and higher weight groups. These actions may result in food becoming associated with many places and events, causing a greater susceptibility to eating in response to environmental triggers. In addition, eating while sitting on the couch may reduce eating intuition due to possible distractions (e.g., television) and eating while standing in the kitchen may result in overeating because people may be

more prone to eating quicker than if they were eating in a more relaxed environment. Eating without awareness is common, as Wansink (2006) found that 91% of people reported that they typically watch television when eating meals, 62% were sometimes or often too busy to sit down and eat, 35% ate lunch at their desks while they work, and 26% often ate while driving.

Despite the overweight group consisting of small number of participants (7 females, 4 males), their data show that distinctively different psychological cues and antecedents determine their eating behaviour compared to people of a healthy or obese weight. Although restricted by the limited number of participants, their data may be a valuable step towards understanding why some people remain stable at an overweight BMI, why some people transit down and successfully become a healthy weight, and why others transgress through to obesity.

Participants in the Obese Range

Unlike in the HWR and overweight categories, the eating behaviours of males and females in the obese category are very similar. Both obese males and females are moderately susceptible to non-hungry eating, specifically in response to emotional (e.g., sadness, anxiety) and environmental (e.g., pre-determined times of the day) triggers. In addition, obese males and females moderately restrict their food intake to lose weight. These eating behaviour patterns are similar to females of a healthy weight.

Although previous research comparing the incidence of emotional eating of males and females are extremely limited, a study by Swanson and Dinello (1970) indicated that emotional eating is more common amongst obese females than obese males, which is in contrast with the findings of this study. The study by Swanson and Dinello, however, is many years out of date which limits its applicability. Gender

differences in emotional eating require further exploration for more definitive conclusions to be drawn.

Obese people usually feel satisfied after overeating. Compared to people of a lesser weight, obese people experience the least amount of guilt after overeating, although absolute values suggest it is still a common emotion, with a third of obese people reporting a guilty feeling after eating a large amount of food. These findings are consistent with the study's other results demonstrating that although many obese participants wanted to lose weight (67%), the desire to lose weight was not as common as among overweight participants (91%). The large discrepancies between the desire to lose weight among obese and overweight participants was unanticipated, given both groups had relatively similar restrained eating scores and considering the vast literature illustrating the immense psychosocial effects of obesity (Brownell & Fairburn, 1995; de Zwaan et al., 2003; Han et al., 1998). Perhaps the obese participants in the current study had learned to accept their excess weight, or believed that they were "too far gone" to try to reach a healthy weight. Another explanation is that they were repressing their desire to lose weight as a protective mechanism as they may have unsuccessfully attempted to lose weight numerous times and it was too painful to consciously have an incessant desire to lose weight. This phenomenon needs further investigation to understand motivation and "readiness to change" among people of different BMIs.

Obese people often eat food quickly, which may cause satiation sensations to be delayed, sometimes resulting in people consuming more kilojoules than if the food were eaten at a slower rate. In addition, obese people frequently consume food while standing in the kitchen. Food may become associated with different areas of the house, and the person may become sensitised to numerous environmental triggers to

eating. As previously mentioned, eating while standing in the kitchen may increase the speed of eating, which reduces the awareness of the eating process, ultimately reducing the enjoyment of eating while increasing the number of kilojoules consumed (Maruyama et al., 2008; Sasaki, Katagiri, Tsuji, Shimoda, & Amano, 2003; Smith & Hawks, 2006, Wansink, 2006).

Obese people are more likely to have family members (parents, siblings, and partners) who are also overweight or obese, compared to people of a healthy weight or who are overweight. Although this finding suggests that eating behaviours may be learned through family models at a young age, this may not be the case as obese people were frequently denied unhealthy food throughout childhood. This finding is consistent with that of Brink et al. (1999) who found people who were obese were more likely to have been governed by strict family rules regarding food and eating (most commonly being required to eat all the food on their plates) compared to people of a healthy weight and people who had successfully lost weight.

The finding that obese people were frequently denied unhealthy food throughout childhood is also consistent with the literature on restrained eating suggesting that denying tasty, unhealthy food can result in future overeating and obesity (Heatherton et al., 1990; Herman & Polivy, 1983). Perhaps obese parents, with the aim of preventing obesity in their own child, decided to restrict their child's intake, which ironically could have become a contributing factor to their child becoming an obese adult**.**

Obese people commonly attribute their excess weight to factors that are outside of their control (luck, chance, fate). This perception may promote a passive approach to weight loss and discourage attempts at lifestyle changes that may assist weight loss such as exercise and healthy eating. Overweight people, however,

commonly attribute excess weight to lack of willpower or motivation, which are personal characteristics seemingly within the control of the individual. Once people make the transition from overweight to obese, attributions may change as a defence mechanism whereby they can no longer cope psychologically with the personal failure that may be associated with their obesity status, if it were in their control. Alternatively, people may attribute their excess weight to factors within their control when they become overweight, but when they try to control their weight unsuccessfully through restrictive diets (and willpower), and eventually gain more weight and become obese, they conclude that their weight is due to factors outside of their control.

Associations between Restraint and Emotional/External Eating

This study found no association between participants' level of restraint and eating in response to external cues, among any of the weight groups. Previous literature exploring the relationship between restrained and external eating have been inconsistent (e.g., Fisher, 1998; Waller & Osman, 1998) and primarily focused on people in the obese weight group. After an extensive literature search, no studies were found that explored and compared the association between restrained and external eating across different weight groups. One explanation for the lack of association between restraint and external eating within any of the weight groups may lie in the sensitivity of the data. Across the board external eating was relatively common for all the participants in each of the weight groups, thus reducing the sensitivity of the data and overpowering correlations.

Different findings were observed for the relationship between restrained eating and emotional eating for the three weight groups. Obese and HWR participants who restricted their food intake were more susceptible to emotional eating compared to

those participants who did not restrict their food intake. Overweight participants who restrained their eating, however, were equally as susceptible to emotional eating as overweight participants who did not restrain their eating. As previously mentioned, the lack of association between restrained eating and emotional eating among overweight participants may be explained by the low number of participants in the overweight group (n = 11).

Conclusion

This study comprised analyses of an extensive amount of data. Despite some variances within each of the groups, distinctive patterns of cues and antecedents of eating behaviours differentiated the weight and gender groups. As males progressed in weight, they were more likely to restrain their eating and eat in response to cues other than hunger, up to a moderate level, which obviously contributed to their weight gain. The moderate level of emotional, external and restrained eating does not adequately explain why obese males maintain such an excessive amount weight. Perhaps for this group, the extra kilojoules from frequent and long bouts of overeating contribute more to their obesity than from short bouts of non-hungry eating.

The eating behaviour pattern among females was not as consistent as among males. Females of a healthy and obese weight were moderately restraining their eating and moderately susceptible to eating in response to cues other than hunger. Overweight females, however, were frequently dieting and were extremely susceptible to eating in response to emotional and external cues. The importance of this finding is twofold. First, the moderate amount of non-hungry eating reported by obese females (similar to obese males) is not adequate to account for the maintenance of their disproportionate weight, and suggests that perhaps, combined with non-hungry eating, overeating also plays a significant role in the excessive number of

kilojoules that are consumed. Second, this finding suggests that future research should target overweight people in an attempt to understand this unique group who are in the 'pre-obese' phase. The finding highlights the lack of current knowledge about the sequelae of obesity and the factors that predispose people to maintain or transit up or down a BMI category. Further exploration is required to determine whether 'overweight' is a transitional stage for people gaining weight from a healthy weight to an obese weight, or if it is a separate stage characterised by unique cues and antecedents associated with food and eating. For example, among people who are increasing from HWR to obese weight category, it needs to be determined whether overweight is a distinctively separate stage for these people, whereby their characteristics change, or are they just transitioning through the overweight category because BMI categories lie on a continuum.

In addition to the low to moderate levels of emotional, external, and restrained eating, several antecedents were common for HWR participants that have possibly served as protective mechanisms to prevent weight gain. For example, during their childhood, food was rarely used to serve other purposes other than as a physiological requirement (i.e., food was rarely used as a reward, incentive, or to soothe pain), and therefore they did not learn to use food as a coping mechanisms for negative emotions. As food was not linked with underlying meanings, these people possibly learned to attune to feelings of hunger and satiety to control food intake. Tasty food was sometimes denied during childhood, and therefore they learned to adopt a 'middle path' approach to eating, whereby unhealthy food is not denied nor eaten to excess. Diet transgressions are not preceded by overeating as diet rules are probably more flexible within this group. Overall, people of a healthy weight were more likely to feel satisfied after overeating and not perceive food as an "enemy", thus

establishing a healthy relationship with food and eating and protecting them from the dieting-overeating cycle.

Overweight and obese participants reported antecedents that potentially predispose them to weight gain. Antecedents, however, were quite different between the overweight and obese groups. Throughout their childhoods, obese people were frequently denied unhealthy food, whereas overweight people were never denied unhealthy food. Having tasty, unhealthy food denied throughout childhood may have promoted future weight gain among obese people as now that they are old enough to have the freedom to control their own food intake, they may over-compensate and eat tasty, unhealthy food to excess. This over-compensation (i.e., counter-regulation) is consistent with the What the Hell Effect (Herman & Polivy, 1980). On the other hand, free access to unhealthy food as children may have caused weight gain among overweight people as they may not have learned how to moderate their consumption of unhealthy food or to regulate food consumption using physiological cues of hunger and satiety.

Compared to other groups, overweight participants were more likely to have had a family history of eating disorders, whereas obese participants were more likely to have family members who were overweight or obese, compared to other weight groups. Both of these situations may have predisposed these participants to weight gain as their primary role models displayed an unhealthy relationship with food and eating, either through eating to excess or significantly restricting their food intake, ultimately shaping their own unhealthy relationships with food and eating (Braet & van Strien, 1997; Mela & Sacchetti, 1991; Wardle et al., 2001).

Most overweight participants have an intense belief that their excess weight is caused by a lack of willpower, whereas most obese people strongly perceive their

excess weight is attributed to factors outside of their control, such as luck, fate, or chance. Although conflicting, these strong perceptions may have caused a predisposition to weight gain. For example, the belief that weight is caused by luck, fate, or chance (out of one's control) may cause an individual to feel helpless and disempowered, and not attempt any interventions to reduce their weight or avoid gaining weight. Alternatively, if one believes that their weight is within their control, they may erroneously assume that their excess weight is due to a lack of willpower, ultimately resulting in guilt which may trigger future emotional eating bouts and yo-yo dieting.

Many overweight participants learned to associate food with underlying meanings at an early age, with food commonly used as a reward, incentive, and to soothe pain. As adults, females who are overweight commonly rigidly restrict the amount of food they consume, whereas overweight males do not frequently restrict their food intake. Perhaps among overweight females, excess kilojoules are consumed because of the dieting-overeating cycle (counter-regulation), whereas overweight males consume excessive kilojoules as they eat quickly and overeat (do not stop eating in response to the sensations of satiety). In both circumstances, overweight people have lost their ability to, or, for many reasons, simply do not use physiological sensations of hunger and satiety to determine their food intake. As most overweight females have had long histories of being informed of when and how much to eat through dieting, they have simply lost touch with these physiological cues, and instead rely on diet guidelines, or internal or external cues to control food intake, predisposing them to weight gain (Herman & Polivy, 1983).

The data and the discussion above highlight the differences in the cues and antecedents between people of different weight and gender. Obesity treatment and

prevention programs have so far been extremely ineffective. To enhance the effectiveness of these programs, a “one-size-fits-all” approach to obesity treatment and prevention needs to be abolished, and programs need to be implemented with a consideration for the different cues and antecedents specific to each weight group and gender. These considerations need to occur on a community and individual level. In addition, research needs to focus towards understanding the sequelae of transiting between the weight categories. Recommendations for future research, along with a thorough analysis on how these findings can be applied to obesity prevention and treatment is examined in the final discussion.

CHAPTER 4

STUDY TWO: CASE STUDIES EXPLORING THE EATING BEHAVIOURS OF THREE OBESE PEOPLE

Introduction

The results of Study 1 revealed several differences between the eating behaviours of obese and non-obese people. The results also showed large within-group differences in the responses of obese people, indicating that eating habits and patterns, and attitudes towards eating and food, vary greatly among people who are obese.

The aim of Study 2 was to gain a more detailed and a rich personal account of the immediate cues and antecedents of eating behaviour in obese people through in-depth case studies of three obese adults who participated in Study 1. Each of the three participants had unique experiences regarding their previous and current patterns of eating, including their susceptibility to emotional and external cues in determining food intake, the extent to which they restrained their eating, and other cues and antecedents of eating behaviour. In addition, all three participants had unique aspects to their motivations for, and current experiences of, managing their weights.

Method

Participants

Invitations to participate in Study 2 were attached to all questionnaires distributed to obese participants in Study 1. Three obese participants accepted the invitation and returned their contact details with the questionnaire. The three participants included two females and one male. The females were aged 44 and 49 years, with BMIs of 30 and 32, respectively. The male participant was aged 40 years and had a BMI of 40.

Procedure

The participants were contacted by phone and briefed as to the purpose of the research and the interview process, and appointment times for the face-to-face interviews with the student researcher were arranged. Interviews were arranged at a place convenient to both participant and interviewer, and included the workplaces of two participants and the house of the other participant. Prior to each interview, the interview process was explained in detail to the participants, including confidentiality and their rights to withdraw from the study at any time. A plain language statement (Appendix Y) and consent form were given to each participant and permission was sought to audio-tape the interview.

The length of the interviews ranged from 45 – 60 minutes. Each interview was transcribed verbatim. For clarity, superfluous utterances such as “ums” and “ahs” were edited from the transcript, except in cases where they were relevant to the tone of a passage or enhanced the meaning expressed in the dialogue. The confidentiality of participants’ identities was maintained by using pseudonyms to replace real names and omitting or modifying slightly identifying sections of the dialogue.

The interviews. Interviews were semi-structured, with probing questions based on each participant’s responses in the questionnaires of Study 1. Further questions were based on additional information volunteered by participants during the interview. Although some questions were asked of all participants, the specific lines of questioning and probing adopted by the researcher in the interviews were different for each participant. This was because the interviews were designed to provide a more detailed understanding of the unique antecedents and cues that influence each participant’s eating patterns and behaviours as identified in Study 1.

All participants were asked questions regarding their history of weight (e.g., when they had gained or lost weight throughout their lives, and any event or triggers that they believe may have contributed to the weight change). Previous experiences of weight and food were also explored with all participants, including how their families' weights shaped previous or current behaviours or thoughts about food and weight, family rules and values regarding food, and other uses of food (e.g., as a reward or bribe). Dieting behaviours and cognitions were also explored, including previous and current dieting behaviours, the type and rigidity of self-imposed dieting rules, and counter-regulation (overeating after breaking a diet).

Data Analysis

The interviews were transcribed verbatim. Responses to the questions were analysed independently by two experienced researchers (student and supervisor), to extract several common themes. Each transcribed interview was organised and interpreted using content analysis whereby individual meaning units in the data were identified, coded, and categorised into primary and secondary themes (Patton, 2002). Patters or themes were derived in two ways: deductively, where key issues and concepts from the interview guides served as organising codes; and inductively, where raw data themes emerged during the process of analysis. The strategy, recommended by Miles and Huberman (1994), emphasises the *a priori* formulation of 'startlist' themes, with further revisions made during data collection and analyses. The primary themes were expected to follow closely the areas raised by the researcher in the semi-structured interviews, with secondary themes representing sub-categories of the primary themes and comprising units of raw data.

The two researchers read and analysed the interview transcripts independently. Both researchers then met to discuss and compare the identified themes and ensured

that consensus was achieved regarding the structuring of thematic coding. This process of cross-checking served as an important reliability check to minimise the intrinsic bias that comes from single-observer research (Patton, 2002).

Case Study 1: Ann

Background

At the time of the interview, Ann was 44 years of age and had a BMI of 32. She was an office worker who had never been married, had no children, and lived alone. Although Ann was born and grew up in Australia, she has a strong French background. None of her immediate family members had ever been overweight or experienced an eating disorder. Ann was not undertaking any weight loss treatments or programs at the time of the interview.

Ann indicated that she has strong familial and cultural ties that, at an early age, shaped her strong perceptions of, and attitudes towards food, eating, weight, and dieting. She has held a relatively consistent body composition throughout her life, reporting that she has "always been a little bit fat."

In her questionnaire, Ann reported that approximately 40% of her eating is non-hungry eating (NHE). The Dutch Eating Behaviour Questionnaire subscale scores showed that her NHE is primarily influenced by external/environmental cues (score = 3.7) such as social situations, rather than internal/emotional cues such as stress or anxiety (1.2).

Motivation to Lose Weight

Ann has never had a strong desire to lose weight, and is quite comfortable with her excess weight.

> A: (Excess weight) never really bothered me incredibly. I'm not really that fussed about necessarily wanting to diet. I don't have that body image thing. You are what you are.

Although Ann appears to accept her excess weight, several of Ann's statements contradict this belief and imply that she would like to lose weight. For example, Ann repeated that three months after her interview for the study, she will compete in an organised 100 km cycle event, which she perceives as a "good and healthy excuse to lose 10 kg." She adds that "Every now and then you have to say 'Right, let's have a bit of an effort and eat a bit less and do a bit more exercise.'" Despite these comments, Ann recognises that this motivation is usually not strong enough to outweigh her enjoyment derived from NHE and overeating.

Diets/Restrained Eating

Ann is extremely against dieting. She understands the physical and psychological ramifications associated with restrictive diets. For example, Ann is aware of the metabolic changes that occur with restrictive dieting, and understands the difficulties of adhering to diets.

Ann is not only personally against dieting, she also judges others who attempt to lose weight through restrictive diets. For example, Ann recalled a recent informal competition among her workmates to lose 10 kg in 10 weeks, stating: "A few of them went and starved themselves for a couple of days to lose 10 kg - utter stupidity!"

Ann's aversion to dieting is partially due to the negative effect dieting has on her social life, which Ann values highly. On the rare occasions when Ann tries to lose weight, rather than modifying her eating or drinking habits, she instead decides to avoid social situations altogether.

> A: Dieting cramps your style in going out to dinner. Everyone says "We're going to the pub" and I go "Well, I won't go to the pub" and that's really sad. I don't like doing that. If you go to the pub and just have soda water, then that's a misery.

In preference to restricting her dietary intake, Ann often uses her awareness of her habitual NHE habits to help her to lose weight.

> A: When I am on a diet I try and modify my behaviour. I try and eat consciously. I try not to automatically do it. I try and think about something else. I don't just sit there and have a piece of chocolate.

Attributions for Excess Weight

How one attributes excess weight can be an important factor in determining action (Saltzer, 1978). For example, if a person believes their excess weight is out of their control (e.g., genetics, fate) (external locus of control) he or she may be less likely to seek treatment. People who have an external locus of control, however, may be less likely to experience guilt and self-blame, and less likely to blame others for being overweight. Alternatively, if a person believes his or her weight is determined by their own actions (e.g., healthy eating, exercise) (internal locus of control) there may be a greater chance of that person seeking treatment. Nevertheless, a person with an internal locus of control may experience more guilt and self-blame (possibly resulting in more emotional eating), and may blame others for their excess weight (Kausman, 2004).

Overall, Ann attributes excess weight to a combination of genetic and motivational factors. Ann perceives excessive weight in others to be mostly due to a pre-programmed metabolic rate, however she believes her own excess weight to be due primarily to overeating.

> A: (Excess weight) is pretty clearly genetic. It's the way you metabolise food. Some people eat a lot and are really skinny; others don't eat much and genuinely put on a lot of weight. I don't count myself in that category in any way. I eat too much. Absolutely.

Ann perceives excess weight in most people to be largely determined by metabolic rate (which is out of one's control), however Ann also strongly believes

that everyone is in control of their own weight (through healthy eating and exercise). In addition, Ann's statements suggest that she perceives weight loss to be almost as easy as merely identifying it as a priority.

> A: I think that it is a matter of priority. If you are passionate about wanting to look good … then you are going to lose weight, of course you will. A lot of people don't recognise it, but if it's a priority, you will do it. If you are very clear on the benefits, then you are going to put a bit of effort in.

Ann's attributions for her excess weight may serve to reassure her, as she believes that weight loss is within her control, and she is confident that whenever she really wants to lose weight she will be able to achieve her weight loss goals easily, through a combination of healthy eating and exercise. Her stated acceptance of her excess weight, taken in combination with various contradictory comments about wanting to lose weight, may be an indication of an underlying fear or concern she has about the reality of not being able to lose weight as easily as she expects.

Antecedents of NHE/Overeating

Familial aspects. Ann considered that her father played an important role in moulding her perceptions and attitudes towards food and dieting. Her father was a Prisoner of War in Germany during the Second World War. During this experience her father suffered extreme food deprivation. Similar to the participants of eating behaviour studies involving World War II veterans who experienced extreme food deprivation (Franklin et al., 1948; Polivy et al., 1994), Ann's father also learned to value food and discredit dieting.

> A: Dad's values were that … diets were ridiculous … diets were modern thinking gone mad. He saw dieting as really quite insulting.

Ann believes that her father's POW experience of food deprivation taught him to value food highly, and as a consequence he strongly discouraged dieting attempts by Ann and her mother.

> A: At school I thought "Oh, I might go on a diet," and Dad would just ridicule it. I remember when Mum went on a diet – couple of Vita Wheat and an egg for lunch or something – one of those old fashioned diets that were stupid, and Dad thought it was just ridiculous. I mean, fair enough!

Cultural influence. Ann's father was French, and because he did all of the cooking, Ann believed that the French culture also influenced her eating behaviour from an early age. Ann explained that French people are very passionate about food, and that they never diet and always eat what they like. Ann identifies highly with this belief.

Ann recalled a study indicating that, despite their passion for food, the French have very low rates of obesity and cardiovascular disease. Ann reiterated that the low rate of obesity and heart disease was due to the smaller portions sizes of the meals typically consumed in France compared to most other countries, including Australia.

> A: In France, when you have an entrée, you have a slice of ham or a tomato salad and a bit of cheese. The concept of entrée is just ridiculous in this country.

Ann's eating behaviour, however, is not consistent with her view of the eating behaviours of French people (i.e., small portion sizes), and she has adapted to the Australian eating style of larger portion sizes of energy dense food and consequent overeating.

The prominent roles that Ann's father and culture took in shaping her attitudes to food and dieting is consistent with various studies illustrating that familial and cultural influences in childhood often determine eating behaviours in adulthood (Birch et al., 1980; Brink et al., 1999; Krassner, Brownell, & Stunkard, 1979). For example, in the study by Krassner et al., a participant whose father was also a POW, like Ann, was taught to value food, and consequently developed strong perceptions against dieting as an adult.

Family rules. Although Ann was not forced to finish all of her meals, her parents had a rule that she at least had to try all of the food that was on her plate. Her French influence meant that her meals were usually varied and quite different to those of Australian children, often incorporating food such as tripe and blood sausage. Ann's family rule of tasting all of the food that was offered to her extended into her adulthood.

> A: Mum and Dad always said "Just taste it", so I have a really broad variety of tastes. I like everything. When I go travelling I would be inclined to buy a lot of things and just taste them.

The family rule of having to try different foods may have enhanced Ann's overall enjoyment of food and her desire to eat a variety of food throughout adulthood.

Passion for food. It is clear that Ann perceives food and eating to serve a variety of purposes including a source of pleasure, social engagement, relaxation, and entertainment. Ann is very enthusiastic about food and eating, and believes that food should be eaten slowly and eating should be a pleasurable experience.

> A: I am a slow eater. I have no need to finish my dinner quickly. There's no hurry; I just like eating dinner. It's because I'm an only child. If you don't finish quickly then nothing bad is going to happen. I was in the Army Reserves and I would sometimes eat quickly because I had to. You've got 15 minutes for lunch and that's stupid! You shouldn't do that! Meals are social. It's a social time.

Apart from just finding pleasure in eating food, Ann also finds the preparation of food enjoyable, and often uses this process to relax and unwind in preference to other forms of stress relief (such as watching television or exercising).

> A: When I get home from work I find it meditative to cut up some vegetables and make a stir-fry. It's nice to sit there and relax and do something different instead of come home and sit in front of the TV. I enjoy the concept of cutting up vegetables. It's mediation time. It's really nice. It's like going for a walk.

Overeating

Weight loss is not a high priority for Ann, and because she is so passionate about food and eating and living in an environment that is conducive to over-indulgence, she is susceptible to overeating. Specifically, Ann says that her portion sizes are usually too big and she enjoys a variety of food. Rather than ceasing eating once her satiation level is reached, she often eats until she has consumed all of the food on her plate.

> A: For instance, you go to a restaurant and you get French cheese. I want a whole bunch (of it); I want a broad variety of it.

Ann reiterates that having knowledge of one's nutritional needs is not sufficient for her to engage in behavioural change.

> A: You just don't need to eat that much. I am aware of how many calories I need. I know if you put a meal on a plate and say "What should you be eating?" I can chop off that, get rid of that, and say "Right, that's what I should be eating." But I've served this; I am going to eat it all. That's the issue. Of course I'm not going to (manage portion sizes). It's not a priority.

Ann also identifies taste as a significant factor or motivator for overeating.

> A: I know very well that it is more food than I need, but it tastes so good so I eat it. Too bad, I'm going to eat it. I like it.

> A: Very often I just go "Well that was nice, I am going to have another one" and I probably have three of four pieces of chocolate. I'm a shocker! I have a piece and then think "I can find something nicer!

Cues Triggering NHE/Overeating

Habit eating. Habit eating is a common form of NHE for Ann, in particular snacking when she arrives home from work and eating at specific times of the day. Ann is aware of her habitual eating and is quite judgemental towards it, but does not express any desire to change her habit.

> A: I have a snack when I get home. That's a stupid thing. You have a glass of wine and a dip or something like that. And again, that's a bad habit.

> A: Sometimes you have a lunch that is a bit more heavy, but you are probably not that hungry, but you feel like having a wine and you have something to go

with it. It's not the world's worst behaviour, but it is a relaxing thing to do.

Although Ann eats dinner at different times in the evenings, she places a high reliance on the time of day (or temporal factors) to determine when she eats lunch. Ann eats lunch at 12.15pm every day. On the occasions when she is unable to take her lunchbreak at the pre-determined time, Ann will begin to look for snacks at 12.15pm, to avoid hunger, often eating lollies from the desks of her colleagues. This behaviour is further evidence of Ann's reliance on external cues to determine eating behaviour, along with her discomfort of the physiological sensations associated with hunger. Eating to avoid future hunger is a common form of NHE, as the physiological sensations of hunger are frequently associated with psychological feelings of emptiness, stress, depression, unhappiness, and deprivation (Kausman, 2004). For example, many people fear the feeling of emptiness associated with hunger, as an empty feeling is often associated with a generalised feeling of a lack of fulfilment or meaning in life.

Social eating. Another external trigger for Ann's NHE and overeating relates to her social life. Ann lives alone but considers herself to be quite extraverted and regularly socialises with friends. Much of this socialisation is centred around food. Ann finds that she commonly eats more food when in the company of others, irrespective of the type of company (friends, colleagues), and whether she is comfortable in the presence of the company or if she is trying to impress her company.

> A: I think I probably eat more around people somehow. I am more inclined to finish (meals) when really I probably shouldn't. … You graze all day then go to the pub for dinner … If you go out for lunch, a good percentage of it I could really do without. My problem is at work we go out to the pub for lunch. That's not very good.

Eating more food when in social situations, irrespective of the type of company, is in contrast to findings of previous studies. Most studies have found that people reduce their food intake if they are trying to impress the other person, or, if the other person consumes a relatively large or small portion size, they ensure the amount of food they consume corresponds with the quantity that is consumed by their company (Conger et al., 1980; de Luca & Spigelman, 1979; Goldman et al., 1991; Polivy et al., 1979; Roth et al., 2001). Herman et al., (2003) suggested that obese people in particular are more vulnerable to the effects of impression management, due to the stigma associated with overeating and obesity, and also to deflect the assumption by others that their obesity is attributable to excessive eating.

Although most obese people tend to reduce their food intake when in the company of others, Ann not only increases the amount of food she consumes on her own plate, she also commonly eats others' leftovers. This behaviour is further indication that Ann is not self-conscious about eating large portion sizes, which is also contrary to what research has revealed about most overweight people.

Alcohol. Ann commonly consumes alcohol when socialising and it is a significant mediator of the type and amount of food that Ann consumes. She believes strongly that it is extremely unhealthy to drink alcohol without eating, so she ensures she consumes a significant amount of food while consuming alcohol. In addition, this food is likely to be high in kilojoules, specifically fat. For example, Ann commented that she commonly eats hot chips when she consumes beer and she usually consumes cheese and olives when drinking wine.

Along with affecting the amount and quality of food that Ann consumes while drinking alcohol, the type of food that Ann consumes the following day is also often affected by alcohol. For example, the morning after drinking a large amount of

alcohol, Ann usually consumes a breakfast that is high in fat. As socialising and drinking alcohol is a common event for Ann, the associated increased intake of high-calorie food contributes greatly to her obesity.

Emotional/internal triggers. Negative emotions, including stress, depression, and boredom commonly trigger NHE and overeating, particularly among overweight people. Nevertheless, unpleasant emotions are not contributing factors to Ann's NHE or overeating. Ann felt that she has never sought food in an attempt to cope with unpleasant emotions, but rather seeks the combination of company and alcohol when she is stressed, anxious, or depressed.

> A: I don't come home and feel bad and eat. If I'm feeling unhappy … I want to go to the pub and have a drink. I'm not going to go to McDonalds or KFC. I'm not going to go home and eat chocolate. I'm going to go to the pub and have a drink. I'm an extravert, so an extravert will seek company, not a piece of chocolate.

Ann probably does not turn to food for emotional comfort because she does not place moral labels on food (i.e., "good" and "bad" food). For example, if Ann was consistently on a restrictive diet, the self-imposed rules in combination with strong negative emotions may result in the What the Hell Effect (Herman & Polivy, 1975, 1980), causing her to overeat in response to breaking her diet. Instead, food and negative emotions are considered by Ann to be very separate.

Ann does, however, perceive a relationship between food and positive emotions. For example, Ann often eats when she is happy. It should be noted, however, that eating when she is happy is usually related to the situation associated with being happy rather than in direct response to the positive emotion itself. For example, Ann states that she is frequently happy when socialising with others, but it is the social situation that triggers the NHE and overeating, rather than her happy mood.

Conclusion

Ann's familial and cultural background has promoted a passionate and non-restrictive attitude to food and eating. At an early age Ann was encouraged to taste a wide variety of food, and now derives enjoyment from all aspects of food and eating. Ann lives in an environment which is conducive to overeating. The plentiful environment, combined with Ann's passion for food and her low motivation to participate in weight-reducing behaviour, means that she susceptible to consuming more food than her body requires.

Ann's main triggers for overeating and NHE are acquired from external cues. Social cues are the most prominent form of external cues, encouraging both NHE and overeating. Ann socialises often, and she regularly consumes more food (particularly unhealthy food with a high kilojoule count) when she eats with others compared to when she eats alone. In addition, during social situations, Ann often drinks alcohol, also affecting the types and amount of food that she consumes.

Habit eating also contributes significantly to Ann's NHE and overeating. Ann often arrives home from work and has a large high-kilojoule snack with a glass of wine, irrespective of her hunger level. In addition, she habitually eats lunch at a very specific time without monitoring her hunger levels.

Internal /emotional cues, on the other hand, seem to rarely play a role in Ann's eating behaviour. When emotionally upset, Ann prefers to socialise and drink alcohol in preference to eating. Although Ann is frequently happy when she overeats, Ann is usually a happy person and her eating is often in response to a social situation rather than her positive mood per se.

Overall, Ann derives immense pleasure from food and eating. Without a strong motivation for improving her health and losing weight, she often indulges in

large quantities of unhealthy food, which consequently resulted in her gaining weight and maintaining the excess weight.

Case Study 2: Julie

Background

Julie was a 49 year-old female with a BMI of 30. At the time of the interview she was living with her husband and three children aged 21, 19, and 16 years. She was working full-time as an orderly at a hospital and as a part-time football trainer. Julie described both her parents as being “fairly big” and her husband and oldest daughter as being moderately overweight. No one in her immediate family has experienced an eating disorder.

Julie estimated that approximately 25% of her eating is non-hungry eating (NHE). Her responses on the Dutch Eating Behaviour Questionnaire subscale showed a high score on the restraint scale (score = 4.3), suggesting that Julie is attempting to lose weight through restricting the type and amount of food that she consumes. Julie’s DEBQ scores suggest that external and emotional stimuli rarely influence her eating behaviour (scoring 1.8 on both subscales). She reports that she seldom eats in response to the clear emotions (2.1) and never eats in response to the diffuse emotions (1.0) that are specified in the DEBQ.

Weight History

Julie stated that her weight had fluctuated most of her life. She remembers being mildly overweight in primary school, but reduced some of her excess weight when she began playing netball in grade 6. Her weight increased again during her teenage years, and her mother put her on a commercial weight loss program (Weight Watchers) when she was 18 years old. Julie lost her excess weight again, and remained a constant 75-80 kg, until she was married and had her first child. Julie then

accumulated weight between the ages of 28 and 33 years, when she married and gave birth to three children. Most of the excess weight was gained between her first and second child. After her third child, Julie lost weight again. Nevertheless, Julie regained the weight when she went through menopause when she was 40 years old and initiated hormone replacement therapy. Julie stated that she has been consistently struggling to lose the excess weight for the past nine years.

Current Weight Loss Treatment

At the time of the interview, Julie was on Weight Watchers "No Count" program. This program involves eating the daily intake of food at three sittings, without any snacking in between. In addition, certain types of food are abolished from the diet (such as dried fruit). Regular meetings are held to educate members on nutrition and eating behaviour and also to serve as a support network for other members. Julie had begun the program six weeks prior to the interview, and had lost 3.5 kg.

Motivations for Weight Loss

Julie indicates a very strong desire to lose weight. This stems from health reasons, reporting that she wants to "be around" for her children. Julie turns 50 years old next year and uses this milestone as a marker in her weight loss attempt. Although she has struggled with her weight for a large part of her life, Julie indicates a strong desire to lose weight before she turns 50.

Attributions for Excess Weight

Julie perceives excess weight to be a result of a combination of metabolism and willpower. Despite her Weight Watchers educational classes discussing that metabolism has no influence on weight, she is convinced otherwise, stating:

J: They say at Weight Watchers it's (excess weight) got nothing to do with your metabolism. That's bullshit. I'm sorry, it does!

Julie dismisses "good luck" as a factor in determining weight, stating that weight loss is within everyone's control. In particular, Julie believes that willpower plays a crucial role in influencing weight loss. This belief is concurrent with her restrictive behaviour and often leads to dichotomous all-or-nothing approach to dieting. Guilt, depression, and overeating (counter-regulation) often follows when diets are broken (Kausman, 2004).

Non-Hungry Eating (NHE)

Although Julie is actively trying to lose weight, as part of the Weight Watchers guidelines she has been instructed to increase her amount of NHE. Julie's Weight Watchers consultant has advised her to eat more food, and disregard natural feelings of hunger and satiety in determining food intake. This advice is causing cognitive dissonance as Julie is torn between eating more food (on the advice of her Weight Watchers consultant) and listening to her body's signals and her own perception that she should reduce her food intake to lose weight.

> J: That's where Weight Watchers say is my biggest problem – I don't eat enough. I think "Ok, I've had enough, I don't want any more." But they are saying that I will lose the weight quicker if I eat more, but then I feel guilty if I eat more (laughs), even if it's the right stuff.

> J: At Weight Watchers you can have a piece of bread, … fruit, plus a bowl of porridge. For lunch you can have soup … a salad sandwich, and … fruit. For tea you can have a piece of meat, salad, and vegetables. And at suppertime you can have a yoghurt and fruit. That's a lot to put in. But as she (Weight Watchers consultant) said, if you don't put it in, you don't lose it. I can't seem to make myself to do that. My body just won't do it.

The Weight Watchers consultant is probably basing her advice to eat more food on the premise that food intake can increase metabolism (Kurpad, Muthayya, & Vaz, 2005). Asking Julie to disregard her feelings of hunger and satiety may increase

Julie's susceptibility to internal and external cues to regulate her eating, and consequently may cause Julie to consume more food that her body requires.

Antecedents of NHE/Overeating

Rewards. Julie recalls that her parents and other authority figures often used food to reward her when she was a child.

> J: I was at school with nuns and they were giving us lollies and everything for winning a game of netball.

This pattern has stayed with Julie and, as an adult, she has recognised that she is prone to rewarding herself with food. Specifically, Julie uses food as a reward for healthy eating during the week, and also perceives eating unhealthy food as "her time." For example, Julie stated:

> J: When I am on the ground at the end of the (football) game I think I am going to pack up everything and have my chips (laugh), because that is my time.

Rules. Julie recalls that as a child, her parents enforced a common rule that she was not allowed to leave the table until she had eaten everything on her plate. This rule can cause a person to rely more on a visual cue rather than the physiological sensation of satiety in determining when to cease eating (Kausman, 2004). The childhood rule also followed Julie into adulthood. Julie believed that, prior to returning to Weight Watchers classes, her food intake frequently would be governed by the amount of food on her plate rather than sensations of hunger and satiety, which contributed to overeating.

Restraint

Deprivation. Consistent with Julie's high score on the Restrained Eating subscale, during the interview Julie regularly commented about the restrictions she places on the type and quantity of food that she consumes to aid her weight loss

efforts. When discussing her dieting behaviour, Julie always emphasised that her restraint does not bother her. For example, Julie stated:

> J: The kids sit down for a roast or something, but I will just have anything I can find in the fridge like bok choy and silver beet and spinach. I'm quite happy with that.

This restraint is not only evident at home, but also at social gatherings.

> J: We went to a party and had roast pork, and they had all the potatoes and the pork, and everything, and I just had a bit of pork, just a little bit, and some bok choy, and I was quite happy with that.

On a superficial level, in the short term, Julie probably was content on eating only a small amount of healthy food, rather than indulging in the more unhealthy foods, because she was able to remain in control and within her diet boundary (Herman & Polivy 1975, 1980). Nevertheless, Julie often finds herself craving unhealthy food. This is consistent with restraint literature that suggests that if a person restricts the type and/or quantity of food they consume, often a preoccupation and cravings for unhealthy food will ensue (Grilo et al., 1989; Ogden, 1995).

Kausman (2004) writes about a weight loss client he was working with who likened dieting to holding your breath – at the start it seems really easy, but as time goes by, you realise that it is impossible to maintain. This metaphor appears to be analogous with Julie, as she reports situations where maintaining her diet is relatively easy and even enjoyable, but also mentions several occasions where her cravings for unhealthy food are so strong they overpower her.

> J: When I get home and have been out in the cold rain all day … that's when I find it really hard, and that's when I break my diet because my body's saying "You just gotta eat something". If I don't eat (what I want) then I get very frustrated, very frustrated … I don't think it's my body, I think it's my mind.

Cognitive and emotional effect of restraint. Restricting the type and/or quantity of food that is consumed commonly leads to feelings of guilt and other negative emotions once the diet has been broken (Kausman, 2004). Throughout the interview, Julie has conflicting / contrasting perceptions of her attitude towards breaking her diet. On one hand, Julie portrays an image of being satisfied and in control when she transgresses her dieting rules, believing that once she has broken her diet she can easily get back in control of her healthy eating. On the other hand, Julie frequently reports feelings of guilt and cognitive dissonance.

> J: The boys have their take-away, so I have a bowl of hot chips. That's all I need. That's all right. That's all fine. So I have it and that's it.
> M: How do you feel afterwards?
> J: Guilty! Very Guilty!

> J: Every time I take a savoury shape … I put it in my mouth and go "I shouldn't be doing this. I shouldn't be doing this."

Like many people who diet, Julie perceives the type and amount of food that she eats as "good" or "bad" (King et al., 1987). To do this, Julie uses a combination of information such as the number of points allocated by Weight Watchers, the amount of fat content in the food, and social norms. Nevertheless, sometimes these data conflict.

> J: Scones are only half a point, but it's fat. I don't know what it is but it seems wrong to eat it. I suppose my brain is retraining. I think, "You don't need this. You might be able to have this when you have lost 20 kg." But then I think, "Well if you lose 20 kg you are going to start putting it back on again.

Behavioural effect of restraint. Perceiving different types of food and eating behaviours as "right" or "wrong" can cause a person to focus more on dieting rules rather on physiological sensations on hunger and satiety in determining food intake

(Kausman, 2004). This dichotomous thinking can also lead to unrealistic expectation of maintaining restricting behaviour, and contribute to lapses and relapses of overeating and bingeing once the diet boundary had been transgressed (Herman & Polivy 1975, 1980). Herman and Polivy termed this behaviour as counter-regulation, and is also known as the What the Hell Effect, where a person overeats after breaking a diet. Although Julie reports being "good" during the week, she acknowledges that she is more likely to eat unhealthy food after she has had her "reward" of hot chips on the weekend. Eating the hot chips transgresses her diet boundary, and Julie takes advantage of the violation by eating a larger quantity of unhealthy food, in addition to the chips.

> J: I just think "Oh well, I have had my chips so I might as well have a couple more savoury shapes", and then I think, "Well I may as well have a couple more".

Julie states that she usually eats these "bad" foods quickly.

> J: I probably eat quicker with foods I shouldn't be eating, because I feel so bloody guilty. It will be over and done with and that's it.

Eating quickly allows Julie to consume a larger quantity of the food that she had been denying herself through the week, as when food is eaten quickly it delays the activation of physiological sensations associated with fullness (Kausman, 2004). In addition, eating quickly allows Julie to get the eating bout over as soon as possible and reduces the awareness of eating the unhealthy food, as the eating bout is usually followed by feelings of guilt.

External Triggers

Visual cues. When Julie is at home she is largely in control of the types of food that is immediately visible and accessible to her because Julie does the food

shopping for her family. When at work, however, Julie is often exposed to tempting food that she has labelled “bad” and, if eaten, will transgress her diet boundary.

> J: This place (staff room) is the worst. They always have chocolate sitting on the bench. That’s very hard. That’s really hard.

Julie is aware of the temptation triggered by seeing unhealthy food, and consciously avoids situations where she may be exposed to temptation.

> J: I usually come in here (staff room) and have the yoghurt and go straight away. I don’t take the full break, but no one knows that anyway, but I just go out. I go off and do my rounds and stay there. I remove myself from temptation.

> J: The kids can have fish and chips when I’m at training, so I can’t be tempted.

> J: If I do grocery shopping then I will have my lunch before I go. Otherwise I see things and I think “Oh that would be nice.” And as long as I eat … before I go shopping then I am fine.

Habit eating. Julie remembers that prior to attending Weight Watchers classes, she would eat out of habit when she wasn’t hungry, particularly after arriving home from work and while watching movies. Julie has since become aware of her habitual eating and has incorporated behavioural techniques to reduce her NHE. For example, when arriving home from work Julie makes herself a cup of tea and sits in the lounge room away from food, rather than in the kitchen. Julie also drinks soda water when watching movies to replace the habitual behaviour of eating.

> J: My husband will sit there and eat a packet of BBQ shapes and I won’t have one. And I’ll be quite happy as long as I have my soda water. I need something else to do.

Emotional Triggers

Julie believes that she regained her weight at around 40 years of age primarily because of stress and depression. Although most people tend to lose weight when

experiencing stress or depression (Schachter et al., 1968), obese people and people who have a history of dieting typically gain weight (Ganley, 1989; Rand, 1982).

Consistent with Polivy and Herman's (1999) theories regarding emotional eating, Julie believed that she would use the immediate, but temporary heightened effect of eating to relieve herself from her depression and stress. Julie said that eating helped to reduce her negative mood and therefore reinforced future emotional eating. Initially, Julie was not aware that she was gaining weight as a consequence of her emotional eating. Nevertheless, when she finally became aware of her weight gain, Julie placed a higher priority on relieving her depression and stress through food than on her concern about her excess weight.

> J: That was reinforcing and then you (eat) more often. (I would think) "Oh yeah, I felt really good after that. Ok let's do some more." Of course you do some more and then you try and fit into your jeans and they don't fit. It felt much better when I was eating. I thought "Nup, this is all good. I'll just keep doing it. Gaining weight (through eating) is a good trade (for reducing depression and stress).

Julie believes that the Weight Watchers classes made her more aware of her emotional eating and she now incorporates behavioural techniques to reduce her susceptibility to eating in response to emotional triggers.

> J: Emotional eating used to be an automatic response for me, but now I am more conscious of it. Now I have tea if I am a bit stressed. I am very aware of the emotional eating, and now I think "Hmmm …… no."

Although Julie believes that she has managed to reduce her eating in response to emotions, she still perceives eating as a source of comfort.

J: Hot chips are my comfort food. Literally, my comfort food.

Summary

Julie has struggled with fluctuating weight as a child and as an adult. She recalls successfully losing weight many times, but has difficulty maintaining the

weight loss. Julie is aware that she is prone to eating in response to feelings of depression and stress, but has incorporated behavioural techniques to minimise her reliance of food to deal with negative emotions.

At the time of the interview, Julie was trying to lose weight and was restricting the type and amount of food she consumed. This restriction, however, was contributing to periods of overeating when she would break her diet, and resulted in consequent feelings of guilt. Although Julie is learning behavioural techniques to assist with external triggers to eating, she recognises that she is still experiencing constant battles with temptation to eat unhealthy food at home and work.

Case Study 3: John

Background

John was a 40 year-old male with a BMI of 40. At the time of the interview he was in his final stages of completing a PhD in psychology, specifically within a psychodynamic framework. In addition, John has undertaken his own psychoanalysis with a therapist for several years. John's background in psychology, along with his psychoanalyic therapy, provided him with insight into antecedents that may have shaped his attitudes and behaviours surrounding food, eating, weight, and dieting. Throughout the interview, John was very open and spoke candidly about some very personal issues that he believed influenced these attitudes and behaviours. Although John himself interprets his eating behaviour primarily within a psychodynamic paradigm, a psychodynamic interpretation of his interview data is beyond the scope of this thesis and will not be undertaken here. Rather, the focus will be on reporting and discussing John's own description and understanding of issues relating to his eating behaviours and weight control.

John's mother and younger sister are moderately to substantially overweight. His younger sister has been bulimic most of her life, and John reports that her weight fluctuates significantly. Although John's father died of emphysema many years ago, John remembers his father as being a slim man, who was always within (and usually at the low end of) the healthy weight range.

John reported in the questionnaire package that approximately 75 percent of his eating is non-hungry eating (NHE). In addition, the Dutch Eating Behaviour Questionnaire subscale showed a relatively high restraint score (score = 3.6), indicating that John is attempting to lose weight through restricting the type and amount of food that he consumes. John's score on the external subscale was also quite high (3.5), suggesting that his eating is often influenced by cues within the environment. Emotional cues also play a dominant role in influencing John's eating behaviour, with high scores for total emotional eating (4.3), diffuse emotional eating (4.5), and clear emotional eating (4.2). These scores indicate that John frequently eats in response to a variety of negative emotions.

Weight History

Prior to turning five years of age, John experienced significant problems trying to keep weight on. According to John, he was quite malnourished and required antibiotics to combat the effects of the malnutrition. He remembers not being interested in eating and food did not appeal to him. John's parents devoted considerable effort in ensuring he ate enough food, and constantly monitored his weight. He was provided with parental reinforcement for eating and gaining weight and grew up in a family environment that had an unusually high emphasis on food and weight.

After about five years of age John was able to achieve and maintain a healthy weight. From his own account he became extremely athletic, achieving state and national success in a variety of sports including swimming, water polo, and Australian Rules football. During his early teenage years and into his early twenties, John was extremely fit, and would run over 100 kilometres per week, He maintained a healthy body weight by increasing his energy intake to coincide with his high energy expenditure.

In his early twenties John required reconstructive surgery on both knees and was on crutches for about a year. Consequently his physical activity diminished considerably. John, however, recalled eating the same amount of food as when he was in full training, and therefore he rapidly began to gain weight.

Prior to his knee surgery, John had moved to America where he formed a large social network. A few years after moving, however, he was forced to return to Australia. John did not want to move back to Australia and consequently developed depression. It was at this time when John began to use food to cope with his negative emotions, which further added to his rapid weight gain.

Since his mid-twenties, John's weight has fluctuated substantially. Attempts to lose weight became an obsession for John, and he remembers many times when he lost 50 pounds (23 kg) in a three-month period.

> J: I'm a bit of a control freak, so once I am a week into the diet I pretty much stop eating. I have to force myself to eat. I can go a whole day without having anything. Once the weight starts coming off I become quite obsessed about how the weight is coming off and what I am eating. I've got a very addictive personality.

Like many dieters, John also found it very easy to put the weight back on just as quickly, recalling a few years in his twenties when he had a 100 pound (45 kg) turn-around within a six-month period.

> J: But of course, if I lost 50 pounds in three months, it would come back on in the next three months. I kinda get to my goal and then once the goal is achieved I start to sit back and relax and enjoy myself and just eat everything I can. And then I'm always confident that I can lose it so I put it on knowing that it's ok because next month I will just lose 20 pounds.

Attributions for Excess Weight

John is aware of the vast number of factors that can contribute to weight gain, acknowledging the role of genetics and biology. Having a psychodynamic orientation, however, John believes that in most circumstances, weight gain can be attributed to a person's experiences, personality, and of course, unconscious processes.

> J: I think people's weight is a combination of every minute you have been alive, every single social interaction you've had, right from the minute you were born, and from when you got the breast, and whether you got the breast, whether your mother could produce enough milk, whether you went on the bottle too early.

John believes that a person's weight is not within the control of the individual. This perception often causes a passive attitude to exercise and healthy eating, as the individual believes they are unable to influence their weight. John's obsessive food and exercise rules while dieting, however, conflict with his belief that his weight is out of his control. For example, throughout the past 15 years, John has attempted to control his weight through strict exercise regimes and food restriction. Throughout the interview, John repeatedly refers to the controlling aspects of food, and how this control influences his eating behaviour. The role of control in John's eating behaviour will be discussed further throughout this case study.

Current Eating Pattern

John's eating pattern can be described as "all-or-nothing", characterised by periods of fasting and bingeing. This pattern is often caused by dichotomous thoughts of either being on a diet, or off a diet. Like many overweight people John never eats

breakfast (Kausman, 2004). He reports feeling full and "sickly" in the mornings, possibly as a result of eating large quantities of food the previous night. Although John estimates that 75 percent of his eating is non-hungry eating (NHE), John's reason for not eating breakfast is that he does not like to start eating for the day until he is hungry. Although initially these statements appear contradictory, John's estimate of his NHE may include overeating (eating past sensations of satiation).

John usually waits until he feels famished before he eats, which often is between 3pm and 4pm. Once John has broken his fast, he continues to overeat throughout the evening and into the night.

> J: Then I get to the point where I am starving and so then I eat way too much and eat into the night.

> J: At night I go to bed and I usually take something to bed with me, you know, a snack such as ice-cream.

John's eating style can be explained by Herman and Polivy's (1983) Boundary Model. First, the Boundary Model implies that compared to non-dieters, greater food deprivation is needed for a dieter to feel hungry and a larger quantity of food is needed for a dieter to become satiated. Second, according to the Boundary Model, people who attempt to lose weight through restricting their eating often set a "diet boundary." This diet boundary determines their maximum desired food intake based on the type and amount of food they allow themselves to eat. Once the diet boundary has been transgressed, restrained eaters continue to eat up to, and often past the point of satiation. Their eating patterns are characterised by cycles of dieting and periodic overindulgence (Herman & Polivy, 1975, 1980).

As John does not consume food during the morning and early afternoon, he is within his self-imposed diet boundary. Once he feels famished, he allows himself to

eat, however, he eats quickly and regularly overeats. Consequently, John transgresses his diet boundary, abandons his rules, and overindulges.

Weight Loss Treatments

John's previous weight loss attempts were usually achieved by following the Weight Watchers points system program. The points system program involves points being allocated to food/meals (according to caloric content) with people being allocated a maximum number of points per day, based on their current weight and weight loss goals. John has never officially joined Weight Watchers, as he is fearful of the meetings and associated weigh-ins.

> J: Every week you have to go to the meetings and they weigh you in. But I don't like weighing in because I find it de-motivating. If I haven't lost any weight I go and buy a cheesecake.

Despite being popular among many health and fitness professionals, Kausman (2004) believes that constant weigh-ins are often counterproductive to weight-loss motivation, and can be a negative experience if a person has not lost a significant amount of weight. This response may be compounded for emotional eaters and "all-or-nothing" dieters who have a dichotomous approach to dieting. Particularly among these people, not losing weight or gaining weight can evoke feelings of guilt and worthlessness and trigger emotional eating and eating in response to the What the Hell effect (Herman & Polivy, 1975, 1980) (e.g., "This diet isn't working, so I might as well eat all the tasty food of which I have deprived myself").

Although John has had some short-term success following the Weight Watchers "Points System" program, he is also aware of the negative aspects of the program.

J: I don't think it's a good program for people like me because I become really

> obsessional about it. I find it is the easiest way to lose weight, but I think it's a really bad program because the whole issue is to not make food the focus or make food that important. Food is just something that you just fill yourself with when you need to. With people who are overweight, food is such an important issue. I become obsessed with what I'm eating and how much I've eaten.
>
> J: So I think unconsciously (the Weight Watchers Points System program) is a very bad idea. Consciously, it's ok, and it works, and you lose weight.

Counting points, kilojoules, or grams of fat is common among dieters (Kauman, 2004). In many circumstances, this behaviour leads to an obsession with the nutritional properties of food (Kausman, 2004). The obsession with food can cause people to regulate their eating according to the external rules of the number of points / kilojoules / grams of fat in the food, rather than according to hunger levels. For example, Shide and Rolls (1995) found non-dieting women consumed more during a subsequent lunch after eating yoghurt perceived as "low-fat" compared to when it was perceived as "high-fat." According to the authors, participants in their study relied more on the perception of the fat content to determine their food intake than their levels of physiological hunger. Results of this study suggest that the body's natural signals to stop eating once satiated were overwritten by the perceived nutritional properties of the food.

During the six months prior to the interview, John had consulted various health professionals to aid him in his weight loss attempts. His general practitioner continues to monitor his associated symptoms such as high blood pressure and high cholesterol, and a dietician is assisting John with a healthy eating plan. In addition, John is continuing his psychoanalytic psychotherapy to explore emotional triggers and antecedents that govern his overeating. Although John reports that he has had some weight loss success over the previous six month period, his thoughts and behaviour associated with food, weight, and eating are still quite disordered.

Motivations for Weight Loss/Psycho-Social Effect of Obesity

In addition to the physical consequences associated with his obesity, John experiences psycho-social difficulties as he endures the stigma and shame associated with being overweight. These psycho-social effects have had a direct influence on John's life. For example, John had planned two trips back to America to visit his friends. He planned to lose a significant amount of weight before the holidays, but was unable to lose the weight and decided to cancel both trips due to the shame of his weight.

> J: Even though it sounds completely ridiculous, the main reason why I put both of the trips to America off was because I haven't lost weight and can't bare the thought of going back so big. The last time they saw me I would have been 30 kg lighter, and my friends would be like "Oh my God, you've got so fat!" I can't bare the thought of that. I am desperate to get back and see my friends. So for me it's a really serious issue.

While comparing his issues with weight as a very skinny child and as an obese adult, John notes the stigmas associated with the differences in weight status.

> J: Because I was a skinny kid … my weight was a constant issue right from the very beginning. Now it's just different. I'm just on the other end of it. A lot of skinny people say "You don't know what it's like to be skinny. I can't put on a pound." Well, I think "Fuck them." There is a big difference. It is socially acceptable to be skinny. And even if you're super-skinny, people say "Oh, they're skinny", but it doesn't matter. They are acceptable, but fat people are not. So it's a constant social battle.

Despite the detrimental health and psycho-social effects of his obesity, John's motivation to lose weight is sporadic. On a rational level, John's health risks may serve as powerful motivators for him to change his eating habits and lose weight. For John, however, the process is more complicated. On a rational level John is aware of the life-threatening health risks, and understands the urgency to change his eating habits. On a less conscious level, however, John continues to eat, and attempts to defy

the health risks to which he is so susceptible. He explains this concept through the example of his smoking habits.

> J: My dad died of emphysema. Both my sisters died of emphysema. So there's every chance in the world I am going to get emphysema, but I keep smoking, and both my sisters smoke. It's very much the death drive. You know it will kill us because we are genetically prone to getting some disease, but it is like a defiance. "You died of lung cancer, but I am going to smoke because I'm not going to die of lung cancer." But I know I'm going to, but I may as well smoke anyway. It's all very complicated and ridiculous, but it makes sense in a way.

These statements further highlight the complexities of weight loss, and that the process of changing eating habits is not as simple as having a strong desire to lose weight, having awareness of the associated health risks associated with excess weight, or knowing what and when to eat.

Dieting/Bingeing /Emotional Eating Cycle

Kausman (2004) proposed a model to explain the food restricting, overeating, and emotional eating often experienced by dieters. According to Kausman, people who decide to restrict their food often perceive food as "good" or "bad", and begin to eliminate bad food from their diets. This labelling of food results in a short-term, false sense of control. The physical and emotional deprivation resulting from strong food restriction often causes dieters to obsess about food and ultimately rebel against their strict rules, resulting in the What the Hell Effect. At this stage, they no longer perceive themselves to be on a diet, and consequently overeat or binge on unhealthy food. Transgressing dieting rules can detrimentally affect body image and cause feelings of guilt, failure, depression, and anxiety, which can, in turn, trigger emotional eating (Kausman, 2004). This pattern appears to be congruent with John's behaviour and cognitions associated with eating, food, and weight.

As with many dieters, John's approach to dieting is dichotomous. John perceives himself either to be on a diet, where he is extremely obsessive about the type and quantity of food he consumes, or off a diet, where he allows himself to binge on the foods he was depriving himself of while on his diet. Also similar to many dieters, John allocates moral labels to food.

> J: I recognise the unhealthy food and say "Well that would be good, but I'm not allowed that. That is wrong, evil, and bad."

Assigning moral tags to food, for example labelling unhealthy food as "bad", "junk", or "rubbish", can cause a person to experience guilt after eating these types of food, contribute to emotional eating, and cause the person to eat more of the unhealthy food (Kausman, 2004).

John's alternating behaviour of restricting and overeating is relatively predictable during the week.

> J: Every Friday I do the same thing. I think "Monday I am going to start my diet" which gives me the licence to eat as much as I want until Monday morning. So I will buy chips and cakes and lollies and pig-out because I know I am starting Monday, so it doesn't matter what I eat now.

John's decision to diet is often accompanied by feelings of elation, control, and excitement. These feelings, however, are very short-term.

> J: Starting a diet I'm always excited, and I throw out everything in the house. Boxes of everything, all into the bin so it's not in the house. Then I go and stock up on diet food. And then I'm so excited and so happy, but then maybe two days later, I think "Fuck, why did I go and throw all those things out? I could be eating all that now."

Maintaining a restrictive diet becomes extremely taxing on John, both emotionally and physically.

> J: When I am controlling myself to diet there's so much energy that goes into controlling myself and not eating stuff. It all becomes about willpower. Then there's more value to the food. The food takes on more value when there's control involved.

John's decision to start a diet is accompanied typically with increased thoughts and cravings for food he otherwise would not obsess about when not restricting his intake.

> J: I have had a block of chocolate sitting next to my bed for about two weeks. Because I haven't really been on a diet for the past two weeks, and I know I'm allowed to eat it, it just hasn't interested me. If I was on a diet I would have to throw it out or eat it. I think it's the control issues. I'm allowed to eat the chocolate, it's there, so I can have it if I want it, but I don't really want it.

John's stronger desire for forbidden food while dieting is similar to the findings of studies, in which participants who make an active decision not to eat specific food are shown to develop preoccupations with the forbidden food (Grilo et al., 1989; Ogden, 1995).

When John ultimately succumbs to the urge to break his restrictive rules, the transgression is usually characterised by a bingeing episode and a rebellious What the Hell attitude. It is commonly triggered by a variety of negative emotions and associated with a period of elation.

> J: If I have a really bad day, if I was really pissed off, the first thing I would think of is to go to the supermarket and I would buy a pack of biscuits and chips and lollies and ice-cream, and I would absolutely stuff myself.

> J: Often I can eat until I'm quite uncomfortable. Like I am completely full, but I've got to eat more.

> J: As soon as I have gone to the supermarket and gotten all the food I am in a much better mood. I'm happy. Everything's ok. I've got food and I'm just going to go home by myself, not see anyone, not talk to anyone, just eat.

> J: If I'm in a really bad mood and I go to the supermarket I will buy so much ridiculous food and then I'm in a super-good mood. Oh yeah, party time, because I get to eat all the good food.

John recalls that it is not the act of eating, but rather the decision to abandon his restrictive diet that helps to relieve his unpleasant emotions.

> J: Once I've said I'm allowed to eat what I want today I am quite happy and high and everything's great.

> J: But it's not the matter of eating it. Sometimes I don't eat it. I've often bought tons of shit and not eaten it. By Monday I've thrown it all out.

Boredom is another emotion that triggers John to start eating. John associates his boredom eating with his controlling needs. While passively engaged in a task (e.g., watching television), John does not receiving any feedback of his involvement in the situation and therefore perceives that he is not in control. John is therefore motivated to eat in order to regain a sense of control (active engagement).

> J: Boredom triggers overeating too. It's not just boredom to me. If I am sitting there watching TV, there's nothing to control. If I am doing something or talking to someone I am in much more control. If I am watching TV, there's nothing to control, therefore the food becomes … there's that value thing again. The food generates value because of the control issues.

External Eating

John's reaction to external eating cues is highly dependent upon his dieting status. When John is on a diet he is tempted by external cues (such as walking past a café or bakery), but because he takes an obsessional stance when dieting he refuses to eat any of the temptations. Once he had transgressed his dieting rules he allows himself freedom to eat whatever food he likes, which is often influenced by visual cues and the hedonic qualities of food, such as taste, smell, and texture.

Antecedents Contributing to Overeating/Bingeing

Family influences. John's family played a primary role in shaping his behaviours and attitudes surrounding eating, food, weight, and dieting. Dieting has always been common among his immediate and extended family, and weight (his and that of other family members) is often discussed and scrutinised.

> J: All my family on Mum's side has always struggled with food. Food is always a big issue. So everyday you see someone they will make a comment on your weight, like "Oh, you've lost weight" or "You've put on weight." That's the focus. My grandparents, my uncles and aunties, everybody. And

> everyone struggles with weight. Everyone's a rollercoaster dieter, go up and down. Everyone's on a diet at some point.

John established a love-hate relationship with food. He learned to rely on food for emotional comfort, yet despises its power over his thoughts, feelings, and behaviour, and is using therapy to gain an understanding of his associations between his mood and eating patterns.

> J: I am in psychoanalysis to work through why I give food so much power.

Sexual abuse. John stated that he and his younger sister were sexually abused by their father and aunties, from as young as he can remember, until John was about 12 or 13 years old. He also considered that the abuse had a profound effect on shaping his negative body image and his need for control in his life, which in turn, affects his thoughts, feelings, and behaviour surrounding food, weight, and dieting.

Many studies have found links between sexual abuse and eating psychopathology (Bulik, Sullivan, & Rorty, 1989; Lacey, 1990). These positive relationships predominantly involve bulimic symptomatology (Everill & Waller, 1995; Welch & Fairburn, 1994), particularly associated with abuse that was initiated at a younger age, involved force, and was perpetrated by a family member (Calam & Slade, 1987, 1989).

Although he does not have bulimia, elements of John's symptomatology are characteristic of binge eating disorder (BED), such as eating a large amount of food in a short period of time, eating until physically uncomfortable, and eating alone due to embarrassment of the quantity of food that is eaten (American Psychological Association [APA], 1994). The APA has listed BED in the section of the DSM-IV titled Eating Disorders Not Otherwise Specified (EDNOS). It is a

lesser-known disorder than bulimia and anorexia nervosa, and although John stated that he did not have an eating disorder, he may not be aware of BED, or may not have considered that he might have BED.

> J: I'm lucky I haven't developed an eating disorder. But I always tell my sister I have amnesia bulimia, where I overeat and forget to purge!

Sexual abuse can affect eating behaviour in various ways. Examples of how the abuse affected John's current eating behaviour include his use of food to establish feelings of control, his use of food as a form of self-harm, and John's body image distortions which often result in feelings of disgust and shame, and consequent overeating and bingeing.

A fundamental aspect of sexual abuse is the sense of control that is taken away from the victim by the perpetrator (Thompson, 1996). Victims of sexual abuse are known to compensate for this loss of control by trying to control other aspects of their bodies, such as restricting their food intake, or overeating and binge eating (Thompson, 1996).

Although John did not specify that he believed there was a direct relationship between his need to control food and his sexual abusive experiences, John alluded to this association when discussing the parallels of sexual abuse and controlling aspects of self-harm and eating behaviour.

> J: Everyone's going to react differently after child abuse. Some people will self-mutilate because it's their way of taking control. "I can do this to my body and I have full control over it. Whatever anyone else did to my body, they can't control this, so I am doing this to my body." That's their only way of having some control over what they do to their body. And I think there's some parallels to eating habits for people who have been sexually abused.

John's abuse was heavily associated with positive reinforcement of food. Following a week of consistent nightly abuse, every Friday night John's father would return home from work with a large bag of lollies. John perceived the lollies as a reward and a signal that the abuse had ended for the week, and associated the lollies with a feeling of relief.

> J: Through my childhood and for my sister it was like "Well here, I will fuck you during the week and Friday night you will get a bag of lollies for it". So, it's like a reward. "So here I am, this monster, and I will rape you, and Friday night I come home and bring you a bag of lollies, and everything's ok." That's the end of it. Now I can relax and stuff my face. Lollies equals nothing's wrong. Food equals nothing's wrong.

As previously discussed, John has carried these associations of food and emotional relief into adulthood. Often after a difficult and stressful week, John goes to the supermarket and buy lollies and other food. Similar to when he was a child, as soon as John gets access to unhealthy food, it is a signal to him that his unpleasant week is over.

> J: As soon as I have gone to the supermarket and gotten all the food I am in a much better mood. I am happy. Everything is ok.

Body image. The sexual abuse endured by John possibly contributed to his development of a deep hatred of his body. John reached puberty earlier than any of his peers, and it was between puberty and his mid-twenties that his exceptionally poor body image reached such a level that he became extremely self-consciousness of showing any skin except for his face, hands, and feet.

> J: I've got big body image issues. That's why I gave up swimming. I just couldn't bare to be in a pair of Speedos in front of anyone. I was horrified and just couldn't do it. So I quit and made every other excuse in the world. From that point on I would never have worn a t-shirt and shorts. Even on the hottest days I would have a long-sleeve shirt on and jeans because I couldn't bare

> anyone looking at my skin. I was very fit and had a reasonably good build, but I just couldn't stand the idea of that.

Although John's poor body image remained, once John began to gain weight his obsession with covering his skin diminished. John believes, however, that he no longer has an urge to cover up with material as his excess weight serves as protection.

> J: Weight has been another way of my covering up in a way. I am covering myself up with loads of flab. Now I can wear shorts and t-shirts because I can still cover myself up with loads of weight.

Researchers exploring binge eating among victims of sexual abuse have theorised that by overeating and gaining weight, the victim will be unattractive to the abuser and the abuse will cease (Thompson, 1996). Although the abuse experienced by John stopped many years before he began to gain weight, on an unconscious level, John may overeat and binge to gain more weight in an attempt to ward-off more abuse.

> J: Some people self-mutilate because they want to make themselves more disgusting because they feel dirty or wrong, and they decide to completely go the full way "because I am gross so let me completely cut myself up so I will scar."

Although the abuse stopped many years ago, John still carries the feelings of disgust and shame, often triggering further overeating.

> J: You feel disgusting. You feel dirty. You feel like you are no good. I think "I'm disgusting, so why don't I go and make myself even more disgusting."

> J: When I get really upset I get really down on myself. I'm disgusting. I'm gross. Nobody's going to love me anyway, so I will just make myself fatter and grosser, and they can all get fucked.

Summary

As an underweight child, living with a family obsessed with dieting and weight, food has always been a focus for John. These factors, in conjunction with John's sexual abuse experiences and poor body image, contributed to John's

predisposition to use food as a source of control and emotional comfort. This predisposition began to manifest in John's mid-twenties, when John developed severe bouts of depression and his physical activity markedly reduced.

Since his mid-twenties, John's weight has fluctuated massively, with periods of extremely rapid weight loss and weight gain. Within these fluctuations, John cycles through episodes of fasting and bingeing. At the beginning of most weeks, John decides to go on a diet. He becomes obsessive and highly restrictive of the type and quantity of the food he consumes. Within days, John transgresses his restrictive rules when he encounters stress, depression, and feelings of failure, loss of control, and self-worthlessness. Once John actively decides to go off his diet, he experiences immediate relief from the negative emotions, and binges on a very large quantity of high-calorie food. Usually John remains off his diet and allows himself the freedom to overeat until the following Monday when, once again, he imposes unsustainable restrictions on food intake. John is aware of his self-defeating behaviour and acknowledges the causal relationship between restriction and bingeing/overeating. Despite his insights, John feels he is unable to change his habits. This provides a clear example of the complexities of weight loss and eating behaviour change.

Summary

The purpose of including case studies in this research was to provide real stories and experiences of obesity, food, eating, and dieting, which can often be lost behind numbers and statistical analyses that currently dominate eating behaviour research. The three participants provided unique stories that highlighted the diverse cues and antecedents that may contribute to a person overeating, and consequently becoming obese.

Although the participants' BMIs are all within the obese weight range, their relationships with their weight and their approaches to food, eating, and dieting, are very different. Overall, Ann has a very positive relationship with food, which was shaped in childhood. Ann was taught to enjoy food, and often associates eating / overeating with positive feelings and events. This appreciation of food, along with her strong negative opinions on dieting (which were strongly influenced by her father), has led Ann to regularly overeat, without consideration for the unhealthy consequences of large portion sizes and high-kilojoule food.

In contrast to Ann, John grew up in a family that perceived food as an enemy, were obsessive with dieting rules, and were critical of people who were overweight. Unlike Ann, John is disgusted with his weight, and much of his life is dominated by his love-hate relationship with food, characterised by periods of cycling between obsessing about dieting and not eating, and obsessing about food and eating. He loves food for its temporary comfort, the perception of control it gives him, and the sense of protection it provides through his excess weight. On the other hand, John hates food as he often overeats which causes shame, disgust, embarrassment, and feelings of failure, to the extent that he perceives his overeating as a method of self-harm.

Similar to John, Julie also has a love-hate relationship with food and eating, characterised with periods of dieting and overeating. Like John, Julie fluctuates between initially enjoying the weight loss and feelings of control while she restricts her eating, and then experiencing the guilt and cognitive dissonance associated with breaking her diet regime. Julie often uses food as a reward for herself, which was shaped in childhood, and has previously used food to relieve feelings of stress and depression.

Although the three participants have unique cues and antecedents that contribute to their overeating, there are similarities within all of their stories. One of these similarities is that the three participants seem to have lost touch with their internal regulation of food intake. Rather than predominantly relying on physiological sensations of hunger and satiety to determine when and how much food they ate, all three participants rely on other variables to govern their food intake. For example, Ann's NHE and overeating is often triggered by social cues, whereas John and Julie commonly overeat in response to feelings of depression, stress, or food deprivation.

Another similar thread among the three case studies is that food is a central component in their lives. Ann perceives food and eating as purely pleasurable sources, whereas John and Julie have a love-hate relationship with food and eating, where food is often used as form of psychological comfort, but paradoxically is the source of psychological distress. Whether food is perceived as a friend, enemy, or a combination of both, the central theme linking all three of the participants is that food and eating are important and powerful components of their lives.

CHAPTER 5

OVERALL DISCUSSION AND CONCLUSIONS

Study 1 found distinctive patterns in the cues and antecedents of eating behaviour that are different between HWR, overweight, and obese groups. The results also showed gender differences in the cues and antecedents of eating behaviours within the HWR, and to a larger extent, the overweight groups. Despite distinctive patterns emerging from the data, the results of Study 2 illustrated that people who are obese have unique histories which contribute to individual variations in the sequelae and maintenance of their obesity. The findings from both studies are useful in understanding the underlying factors that contribute to people developing obesity and maintaining the excess weight. In turn, this understanding will allow for more effective treatment and prevention strategies that, in the past, have previously had limited success in reducing the obesity epidemic.

Implications for Prevention

Population-based health prevention interventions are often established on the popular primary-secondary-tertiary continuum model (Institute of Medicine, 1996). In its report on the Global Epidemic of Obesity (World Health Organisation, 2000c), the World Health Organisation recommended that the primary-secondary-tertiary continuum be replaced by a three-level framework (universal, selective, and targeted prevention) that classifies obesity prevention strategies according to the segment of the population to be targeted. These strategies may include the participation of schools, workplaces, the advertising industry, the food and beverage industry, the federal government, local governments, and community and non-government organisations.

Universal prevention includes interventions that foreshadow the onset of obesity. These interventions are directed at the entire community without any selectivity on weight status or apparent risk of becoming obese. Selective prevention, however, identifies population-based interventions that are directed towards subgroups who have an above average or high risk of becoming obese. Selective prevention measures target people who are overweight in an effort to keep them from gaining more weight and entering the obese category. Populations are also targeted on the basis of biological, psychological, or social/cultural risk factors that are known to be associated with obesity. Targeted preventions, on the other hand, are directed towards people who are already obese. The aims of targeted prevention strategies are to assist people who are currently obese to lose weight in order to minimise the health risks that are associated with obesity.

A weight-loss paradigm shift. Results from this research have supported restraint theory literature that suggests that restrictive diets are not just ineffective for weight loss, but they actually cause future weight gain (Heatherton et al., 1990; Herman & Polivy, 1975, 1980, 1983; Ogden & Greville, 1993). Study 1 showed that males of a healthy weight were not as conscious of the type and amount of food they ate compared to other groups, and people of a healthy weight were less likely to overeat after periods of dieting. Textual responses also highlighted the ineffectiveness of dieting. For example, one overweight participant wrote “I have been dieting on and off for about 10 years”.

Study 1 also showed the psychological distress that often results after breaking a diet. Almost three-quarters of overweight participants feel guilty after overeating and 27 percent reported feeling disgusted after overindulging. Across all the weight groups, more females than males experience negative emotions (e.g., guilt, shame,

disgust) after overeating. These negative emotions are often counter-productive as they can promote further emotional eating and consequent weight gain. Consistent with these results, interviews in Study 2 illustrate two participants' struggle with the disappointments, feelings of failure, guilt, depression, and low self-esteem, and eventual overeating and weight gain that is often caused by dieting.

Study 1 found that 91 percent of overweight participants, 67 percent of obese participants, and more than half of the participants in the healthy weight range reported that they wanted to lose weight over the six months prior to participating in the study. Australians who are desperate to lose weight are spending hundreds of millions of dollars annually on diet products and services, with seductive promises of rapid weight loss. Initially, those consumers often lose some weight, only to regain the excess weight when the unsustainable diets are ceased. The resulting weight gain often causes more psychological and physical damage, and motivates many people to blame themselves for the failure and once again turn to the questionable diet industry in subsequent attempts to lose weight. Supporting this phenomenon are the results of Fletcher, Pine, Woodbridge, and Nash (2007) who found that of the 67 percent of women who had previously been on a diet, 68 percent had tried to lose weight between one to four times, 16 percent between four to seven times, and 15 percent had tried to lose weight more than seven times. The modal age group for participants in this study was 16 – 20 years.

Given there is a causal relationship between dieting and obesity (Herman & Polivy, 1975, 1980, 1983), and millions of people are using the diet industry as their default approach to weight loss, a substantial paradigm shift needs to occur. The general perceptions in the community are that 1) the level of "overweight" can be determined by a BMI chart and is primarily caused by laziness or gluttony (or a

combination of both); 2) the solution to obesity is to go on a diet and simply stop eating so much food and discipline oneself to do more exercise; and 3) everyone can be slim if they try hard enough and everyone needs to be thin to reach and maintain optimal health and personal happiness (Kausman, 2000).

In order to lose weight, people are avoiding eating for long periods of time, refraining from eating certain types of food, and strongly restricting the total amount of food eaten (Higgins & Gray, 1999). Supporting these counter-productive techniques, the public health and nutrition professions continue to focus on individual calorie counting and restriction as a way to promote weight maintenance and weight loss (Bren, 2002; United States Food and Drug Administration, 2005; U.S. Department of Health and Human Services, 2005). Health professionals and the community need education to help change these largely ineffective and counter-productive beliefs, perceptions, values, and practices associated with excess weight, food, and eating.

Currently, the Australian Government's Preventative Health Taskforce is in the early stages of regulating the Australian weight-loss industry by urging a review of diet products and establishing a code of practice covering the cost and promotion of diets and the training of nutrition counsellors (Commonwealth of Australia, 2009). Under the new regulations, commercial diet programs will be independently assessed on the programs' success in keeping clients' weight off for two years. Given these programs are usually food restrictive by nature, the nutritional content of these programs should also be monitored. In addition, because commercial weight loss programs are typically unsustainable in the mid to long-term time frame, with retention rates averaging about 6.6 percent after 12 months (Finley et al., 2007),

factors that affect adherence to the diet programs should also be considered in these reviews.

In addition to these welcomed regulations, people need to be educated about the ineffectiveness of dieting and the physical and psychological risks of dieting. In Australia, Dr Rick Kausman is leading the move to a “non-dieting” approach to weight loss, educating individual patients as well as the community and healthcare professionals about the futility and dangers of dieting as well as offering an alternative approach to weight management. Kausman incorporates scientifically-based strategies to reduce non-hungry eating without deprivation by targeting cues and antecedents that contribute to non-hungry eating and overeating (Kausman, 2004). A review of this non-dieting approach of dialectical behavioural therapy has produced promising results. A 12-month follow-up showed the program aids long term weight loss through reducing non-hungry eating, slowing the speed of eating, increasing physical activity, reducing fat intake, reducing guilt after eating, and increasing enjoyment of food (Kausman, Murphy, O’Connor, & Schattner, 2003).

Prevention strategies also need to focus on the language and moral labels that are placed on food, for example, branding healthy or low caloric food as “good” and unhealthy or high caloric food as “bad”, “junk”, or “rubbish”. Another example of moral labelling on food includes when many food companies adopt the term “guilt free” rather than “fat free” and the everyday language people use such as describing oneself as “bad” after consuming high-kilojoule food. Moral labels placed on high-kilojoule food are becoming more common, especially within primary schools where many school are banning “junk” food (or what is frequently termed “confectionary”). This approach communicates a message that high-kilojoule food and drink are bad, which may increase the desire to rebel and consume banned products, create guilt and

shame that may increase emotion eating, and create greater stigma towards people who are overweight or obese. These responses were observed among two of the participants in Study 2.

Awareness of non-hungry eating. Rather than focusing on what or when people eat, health professionals need to help people understand the underlying reasons behind why they eat. The current study found that people who are overweight or obese typically eat food before the physiological sensations of hunger are initiated, which consequently increases the number of kilojoules they consume during the day, thus contributing to their excess weight. Many overweight and obese people have learned to ignore the feelings of hunger and satiety, and instead rely on dieting rules or emotional or external triggers to control their eating behaviours. Prevention and treatment strategies need to address why people eat other than primarily to serve a physiological requirement. People, particularly those who are, or are at risk of becoming, overweight or obese need education and guidance to focus on their physiological sensations of hunger and satiety to determine food intake rather eating in response to emotions, habits, environmental triggers, or strict dieting rules.

Manage emotional eating. This research showed that many people who are above a healthy weight frequently rely on food to help them to cope with negative emotions such as sadness or loneliness. Emotional eating was especially prevalent among females who were overweight and among both males and females who were obese. Health professionals need to appreciate the influence of emotions on eating behaviour and consider referring clients to counsellors or psychologists to learn techniques to cope with unpleasant emotions rather than temporarily masking the emotions through food.

Prevention strategies for children. Studies 1 and 2 highlighted that the eating behaviours of adults are often learned during childhood. It is during these early years of life when people form associations between food and various positive emotions (e.g., love, comfort) and negative emotions (e.g., shame, guilt). It is therefore vital for obesity prevention measures to focus on educating parents and carers on the importance of not using food to communicate emotions such as love or pride, or to provide/deny food as a form of reward, punishment, or comfort.

Studies 1 and 2 found participants who were over a healthy weight often associated food with underlying meanings/emotions. For example, overweight participants, and to a lesser extent obese participants, were frequently provided with food as a reward or to soothe pain. These associations were most likely learned during childhood. Several strategies can be implemented at a family level to avoid children learning to use food as a reward, to soothe physical or psychological pain, or as a source of love. Parents can be discouraged to make rules about food and eating (e.g., eat all the food on the plate) or use food as a source of reward, punishment, or bribery.

This study suggested that a "middle path" approach to healthy eating throughout childhood helped a person to maintain a healthy weight into adulthood. For example, most people of a healthy weight reported that they were provided with tasty, unhealthy food in moderation during their childhoods. Supporting this middle path approach are the findings that overweight people were frequently provided with unrestricted access to unhealthy food during their childhood, whereas many obese people were often denied tasty, unhealthy food altogether.

Minimise environmental cues. Eating in response to external cues (e.g., impulsive eating when tasty food is visible or accessible) was the most common form of non-hungry eating across all weight groups. Therefore strategies minimising

external triggers to eating also need to be considered. These strategies can be implemented within food outlets as well as through the regulation of advertising of high-kilojoule food. For example, the Australian Government has proposed future restriction on the advertising of energy-dense but nutrition poor food, and will consider prohibiting toys, competitions, and the endorsements of unhealthy food through celebrities and cartoon characters to children (Commonwealth of Australia, 2009). Regulating product placement in supermarkets that is designed to trigger external cues to eating high-kilojoule food (e.g., placing confectionary at checkouts and within easy reach of children) may also reduce non-hungry eating.

Encourage mindful eating. Both the qualitative and quantitative data showed that people who were over a healthy weight frequently ate food quickly, often standing in the kitchen or sitting on the couch. These findings suggest that people who are overweight or obese often eat quickly with distractions (such as watching television), indicating that they do not focus on the taste of the food nor focus on their levels of satiety, possibly resulting in overeating. Slow and intuitive eating causes satiety cues to commence earlier resulting in more physical and emotional satisfaction after consuming fewer kilojoules. Healthcare professionals need to educate people about the benefits of eating slowly and intuitively as these behaviours have been associated with lower BMI and higher levels of enjoyment and pleasure of food (Maruyama et al., 2008; Sasaki, et al., 2003; Smith & Hawks, 2006).

Educate healthcare professionals on an approach to weight management that does not include dieting. Primary healthcare professionals, including general practitioners, psychologists, fitness advisors, and dieticians, are in valuable positions to intervene in the prevention of unhealthy weight gain across a broad spectrum of the Australian community. Unfortunately, many of these healthcare professionals do not

have adequate education or resources to effectively manage the growing rates of obesity (Commonwealth of Australia, 2009). The NHMRC "Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults" and "Clinical Practice and Guidelines for the Management of Overweight and Obesity in Children and Adolescents" have not been updated since 2003. In addition to being relatively outdated, these guidelines lack sufficient information about the role of non-hungry eating (external and emotional eating) and overeating, and the benefits of using the body's physiological responses to hunger and satiety to determine food intake. Limited training and a lack of appropriate knowledge and skills of general practitioners and other primary healthcare providers are common barriers to providing care to overweight and obese people (Campbell, Engel, Timperio, Cooper, & Crawford, 2000; Harvey, Piterman, Dixon, & O'Brien, 2006; Simkin-Silverman, 2008; World Health Organisation, 2000c).

In addition to these strategies designed to modify eating behaviour and attitudes towards dieting, a widespread campaign is required to address the discrimination and stigma towards people who are overweight or obese. This stigma, embarrassment, and shame can cause people who are over their most healthy weight to avoid seeking treatment, as well as increase overall psychological distress and increase guilt after overeating. This guilt can, in turn, increase emotional eating and the overall risk of further weight gain. Health professionals need to be educated on the importance of broaching the topic of weight loss in a non-judgemental manner, using unconditional positive regard and avoiding offensive language or pejorative connotations. The language adopted by health-care professionals while talking to people who are over a healthy weight is particularly important as, if it is not handled

in a sensitive manner, it could result in an abrupt end to a discussion of weight loss treatments (Wadden & Didie, 2003).

Although certain societal messages suggest that a degree of body dissatisfaction could encourage individuals to adopt a healthy lifestyle, women who focus on the functionality of their bodies and hold positive feelings towards their bodies are more likely to eat intuitively and regulate intake according to their bodies' internal hunger and fullness signals (Avalos & Tylka, 2006). These findings suggest that, despite popular perception and techniques adopted by some health professionals on television, health professionals should avoid motivating people through shaming them into action.

Although many of the strategies that have been identified can be implemented at a community level, healthcare professionals (incorporating a range of professionals such as medical doctors, psychologists, dieticians, and fitness advisors) need to understand these issues at an individual level. It is important for health professionals and policy-makers to appreciate and cater for the cues and antecedents that contribute to excess weight that are unique for individuals in the target population. Without addressing the underlying antecedents and cues of eating behaviour, the effectiveness of exercise and nutrition programs will be limited.

Limitations of the Research

The quantitative study reported in this thesis comprised a relatively small sample size, particularly within the overweight and obese groups. This occurrence can be explained by the response rate of 15% for the obese participants compared to 72% for the participants in the HWR. This pattern may reflect a much broader phenomenon, reflecting the embarrassment and shame among obese people, and their

reluctance to share their experiences with an often degrading ailment. This phenomenon has been reflected in studies illustrating that many overweight and obese people are avoiding or delaying medical care due to societal and medical stigmas of obesity (Cohen, Perales, & Steadman, 2005; Drury, 2002).

Despite a relatively small sample size, many results achieved both statistical and / or meaningful significance, with distinctive patterns emerging from the data. Where statistical significance was not apparent, effect size was calculated to avoid a Type 2 error. These effect sizes were often moderate to strong, indicating meaningful significance.

Study 1 adopted different sampling strategies to recruit participants for each of the weight groups. Obese participants were primarily recruited through gymnasiums and a weight management clinic. Participants in the HWR comprised of members of gymnasiums, employees at a hospital, and members of the general public. The overweight group comprised of people from all of the populations listed above. The different sampling strategies adopted for the specific weight groups may have influenced some results, in so far as they may question the representativeness of the results for the population groups. Different sampling strategies may have specifically influenced the results exploring the participants' desire to lose weight (e.g., participants recruited from weight management and fitness centres were most probably already tying to lose weight). Nevertheless, the weight group who were recruited from the widest variety of sources (and therefore were most representative of their specific population) displayed the highest desire to lose weight. Although participants may not have been representative of the entire population of each group, results found considerable variation within each group, suggesting that the HWR,

obese, and overweigh populations aren't homogenous as to their histories, behaviours, and their understandings of eating and weight management.

Implications for Future Research

Research within eating behaviour literature has focussed primarily on the comparison of people who are obese with those of a healthy weight and has largely neglected people in the overweight weight range. The current research has shown that people who are overweight have distinctively different psychological cues and antecedents that determine their eating behaviour compared to people of a healthy or obese weight. Future research should target this "pre-obese" group as they may hold valuable information as to why some people remain stable at an overweight BMI, why some people transit down and successfully become a healthy weight, and why others transgress through to an obese weight. Understanding why certain overweight people gain progressively more weight and transgress through to obesity is crucial to developing successful interventions to reduce obesity levels.

Longitudinal studies are scarce within eating behaviour research. Nevertheless, longitudinal methodology is recommended to supplement the findings of this study, in order to explore the characteristics of people who remain stable within their weight categories and those who transit up and/or down, and the underlying mechanisms behind these transitions. Longitudinal research and related intervention studies / trials of overweight people are extremely important as they may hold important clues to understanding and preventing the process of transitioning from a category of relatively low to moderate health risks (overweight) into a category associated with extremely high health risks (obesity).

Conclusions

Findings that have emerged from this research suggest that people of a healthy weight have favourable relationships with food, conducive to primarily using food to serve a physiological need, with low to moderate amounts of non-hungry eating. In particular, males of a healthy weight rarely use food as an emotional coping mechanism. In contrast, people who are overweight tend to have a damaging relationship with food, weight, and eating, compared to HWR or obese people. Overweight females, in particular, tend to associate food with underlying meanings (such as a source of reward, love, or emotional comfort), see food as the enemy (restricting food, resulting in yo-yo dieting), and be more susceptible to emotional cues that trigger non-hungry eating.

People who are categorised as having a BMI in the overweight range have largely been neglected in obesity research. Nevertheless, this group may hold valuable clues to interventions targeting the prevention of obesity, particularly in the subgroup that is at high risk of transitioning through to an obese weight. Further research incorporating longitudinal studies exploring the mechanisms behind the transitions between the different weight categories is recommended. This type of research is important to create and implement treatment and prevention strategies that have previously failed to control the increasing rate of obesity worldwide.

Large public campaigns designed to educate the community about the ineffectiveness and dangers of dieting need to be implemented for a paradigm shift to occur regarding weight loss treatment. Health professionals working in the treatment or prevention of obesity need to be aware of the patterns and typical antecedents and cues that predispose someone to become and stay obese, but also have an appreciation of the unique cues and antecedents that may cause an individual to develop and maintain an obese weight.

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APPENDIX A

Plain Language Statement (Study 1)

PLAIN LANGUAGE STATEMENT (STUDY 1)

Dear Participant,

My name is Michelle Cranston. I am currently completing a Masters of Sport Psychology at Victoria University.

As part of my course, I am undertaking a study on eating behaviour. In particular I am interested in identifying why people begin and stop eating, and the thoughts, feelings, and behaviours that people adopt regarding food and dieting. Past research has shown that eating can be motivated by internal cues (e.g., habits and emotions), external cues (e.g., taste, smell, social, availability) and physiological cues (hunger), as well as other factors such as childhood experiences and dieting history. Most studies so far have been relatively limited as they have only studied one source of motivation during one eating setting. This study will attempt to extend previous research, to obtain an overall perspective on why people eat. It is hoped that this study will provide a foundation for future research analysing eating behaviour that will result in identifying techniques that may assist individuals to modify their eating habits and have greater control over their weight. This study may also provide benefits to you by assisting in developing awareness of potential triggers that may cause you to overeat.

As a participant of my study, you will be requested to complete a questionnaire of approximately 25 minutes duration, that will ask questions about your eating behaviour, and perceptions on food and dieting.

Personal information will be treated with the utmost confidentiality by researchers. No individual will be identified in the report, as only group data will be used in the analysis.

As some people find discussing eating behaviour to be a sensitive topic, I understand that participating in this study may be uncomfortable. Participation is totally voluntary, and return of the questionnaire indicates consent to be a participant in this research.

I thank you in advance for assisting me in my research. Should you have any concerns or queries about the research project, please do not hesitate to phone Dr Harriet Speed at Victoria University on 9919 5412. If at any stage you have concerns about the conduct of the research project, please contact the Victoria University Human Research Ethics Committee (ph: 9688 4710).

Yours sincerely,

Michelle Cranston
Student, Victoria University
michelle.cranston@research.vu.edu.au

Dr. Harriet Speed
Principal Investigator
Victoria University
(03) 9919 5412

APPENDIX B

Questionnaire

EATING BEHAVIOUR QUESTIONNAIRE

Victoria University

Please complete the following questions. Return the completed questionnaire using the enclosed reply paid envelope.

Thank you for your contribution. Your involvement is most appreciated

PERSONAL DETAILS

1. Age: _____ years **2. Sex:** ☐ Male ☐ Female

3. Weight _____ kilograms / pounds **4. Height** _____ metres / cms OR _____ feet / inches

5. Nationality: ☐ Australian ☐ Other _____ (please specify)

6. Marital status: ☐ Single ☐ Married ☐ De facto ☐ Divorced

☐ Widowed ☐ Other _____

7. Number of children: _____ **Age(s) (years):** _____ _____ _____ _____ _____

8. Has anyone in your family experienced an eating disorder? YES NO UNSURE

If so, what is their relationship to you (e.g., mother)? _____

What was/is the nature of their eating disorder (e.g., anorexia)? _____

9. Are any members of your immediate family currently overweight? YES NO

If so, what is their relationship to you (i.e., brother)? _____ _____

To what extent are they overweight? _____
sightly (5-10kgs), moderately (10-20kgs), substantially (20kg+)

NON HUNGRY EATING

People eat in response to a variety of situations, apart from the physical sensations of hunger. Situations that may trigger eating may include emotional responses (stress, loneliness, happiness), environmental cues (seeing food sitting on the bench), or habits (eating because it is 'lunch time'). When people eat when they are not experiencing physical feelings of hunger, it is termed 'non-hungry eating'.

10. On the diagram below, please estimate the amount of your food intake that is non-hungry eating (due to other factors than in response to physical hunger) by placing an X on the line.

0% _____25%_____50%_____75%_____ 100%

no 'non-hungry eating'	**half non- hungry eating**	**all non-hungry eating**

Any additional comments regarding the amount of non-hungry eating?

_____

_____

_____

_____

_____

RESTRAINED EATING

Restrained eating refers to times when people restrict the amount or type of food they eat in order to lose weight.

Please answer the questions below on restrained eating using the response code provided.

Response Code:

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response					Any Comments?
11. When you have put on weight, do you eat less than you usually do?	1	2	3	4	5	
12. Do you try and eat less at mealtimes than you would like to eat?	1	2	3	4	5	
13. How often do you refuse food or drink because you are concerned about your weight?	1	2	3	4	5	
14. Do you watch exactly what you eat?	1	2	3	4	5	
15. Do you deliberately eat foods that are slimming?	1	2	3	4	5	
16. When you have eaten too much, do you eat less than usual the following day?	1	2	3	4	5	
17. Do you deliberately eat less in order not to become heavier?	1	2	3	4	5	
18. How often do you try not to eat between meals because you are watching your weight?	1	2	3	4	5	
19. How often in the evenings do you try not to eat because you are watching your weight?	1	2	3	4	5	
20. Do you take into account your weight with what you eat?	1	2	3	4	5	

Any additional comments regarding your restrained eating?

EMOTIONAL CUES

Emotional cues such as depression, happiness, and boredom sometimes trigger eating.

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response	Any Comments?
Do you have the desire to eat when: **21. you are irritated?**	1 2 3 4 5	
22. you have nothing to do?	1 2 3 4 5	
23. you are depressed or discouraged?	1 2 3 4 5	
24. you are lonely?	1 2 3 4 5	
25. somebody lets you down?	1 2 3 4 5	
26. you are cross?	1 2 3 4 5	
27. you are expecting something unpleasant to happen?	1 2 3 4 5	
28. you are anxious, worried, or tense?	1 2 3 4 5	
29. things are going against you, or when things have gone wrong?	1 2 3 4 5	
30. you are frightened?	1 2 3 4 5	
31. you are disappointed?	1 2 3 4 5	
32. you are emotionally upset?	1 2 3 4 5	
33. you are bored or restless?	1 2 3 4 5	
34. you are happy?	1 2 3 4 5	
35. you are relaxed?	1 2 3 4 5	
36. you are excited?	1 2 3 4 5	

Any other comments regarding your emotional eating?

_____

_____

HABIT CUES

Habit cues refer to eating that is usually part of a routine, and is sometimes automatic behaviour.

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response	Any Comments?
Do you eat to avoid the feelings of: **37. having an empty stomach?**	1 2 3 4 5	
38. low energy levels	1 2 3 4 5	
39. other sensations of hunger?	1 2 3 4 5	

40. Do you eat out of habit? (i.e., immediately after arriving home from work, while watching television, because it's 'lunch time', etc.) . If so, please describe the situation(s).

SENSORY CUES

Sensory cues such as sight, smell, taste, and texture can sometimes trigger eating bouts.

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response	Any Comments?
41. If food tastes good to you, do you eat more than usual?	1 2 3 4 5	
42. If food smells and looks good, do you eat more than usual?	1 2 3 4 5	
43. If you see or smell something delicious, do you have a desire to eat it?	1 2 3 4 5	
44. If you have something delicious to eat, do you eat it straight away?	1 2 3 4 5	
45. If you walk past the baker, do you have the desire to buy something delicious?	1 2 3 4 5	
46. Do you actually buy it?	1 2 3 4 5	
47. If you walk past a snack-bar or café, do you have the desire to buy something delicious?	1 2 3 4 5	
48. Do you actually buy it?	1 2 3 4 5	
49. Can you resist eating delicious foods?	1 2 3 4 5	

Any additional comments regarding sensory cues to eating (i.e., sight, smell, taste, texture)?

SOCIAL CUES

Social cues triggered by other people, and social situations can sometimes initiate eating.

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response	Any Comments?
50. If you see others eating, do you also have the desire to eat?	1 2 3 4 5	
51. Do you eat more than usual when you see others eating?	1 2 3 4 5	

52. When you are eating with others, how much food do you eat, compared to when you are alone? Please respond by placing an X on the scale

I_____I_____I_____I_____I

Much Less Than Usual	**a little less than usual**	**about the same amount**	**a little more than usual**	**much more than usual**

ENVIRONMENTAL CUES

Environmental cues in your surroundings can sometimes produce an eating bout.

Response Code:

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response	Any Comments?
53. When preparing a meal, are you inclined to eat something?	1 2 3 4 5	
54. Do you eat at pre-determined times of the day (i.e., lunch at 12.30pm)?	1 2 3 4 5	
55. Do you wait until you are hungry to eat?	1 2 3 4 5	

56. Throughout the course of a typical day (at home and/or at work), do you usually find that food is visible: *(please tick only ONE box)*

☐ **only at mealtimes?**

☐ **at mealtimes and some other times?**

☐ **frequently throughout the day?**

Any additional comments regarding your social or environmental cues to eating?

MEDIATING VARIABLES

Sometimes eating is caused by other variables including affect (emotional reactions), behaviour, previous experiences, and dieting perceptions.

57. When you have eaten too much, do you usually feel: *(Please tick all of the relevant boxes)*

☐ **guilty** ☐ **ashamed** ☐ **disgusted** ☐ **satisfied**

☐ **relaxed** ☐ **relieved** ☐ **numb** ☐ **in high spirits**

Response Code:

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response	Any Comments?
58. Do you eat if you wake during the night?	1 2 3 4 5	
59. Do you feel that you eat quickly?	1 2 3 4 5	
60. How often do you binge eat (out of controlled, excessive eating in a short period of time?)	1 2 3 4 5	

Any other comments regarding your eating behaviour?

61. Please describe your current eating patterns in relation to meals and snacks (i.e., usually have three meals a day, and a snack between breakfast and lunch, and lunch and dinner).

62. Please RANK the locations where you most commonly eat (starting with 1 being the most common)

- ☐ **sitting at the dining room / kitchen table**
- ☐ **standing in the kitchen**
- ☐ **sitting on the couch**
- ☐ **in the car**
- ☐ **in the bedroom**
- ☐ **at the office desk**
- ☐ **other _____ (please state)**
- ☐ **other _____(please state)**
- ☐ **other_____ (please state)**

Any comments regarding the location where you eat?

_____

_____

_____

_____

PREVIOUS EXPERIENCES

1 _____ 2 _____ 3 _____ 4 _____ 5
never seldom sometimes often very often

Question	Response	Any Comments?
In the past, to what extent: **63. have you been conscious about the type and amount of food you eat?**	1 2 3 4 5	
64. were your family members overweight?	1 2 3 4 5	
65. was food given as a reward, an incentive, or to soothe physical or emotional pain?	1 2 3 4 5	
66. was tasty food denied because it was unhealthy?	1 2 3 4 5	

Any other comments regarding your previous experiences of weight and food?

_____

_____

_____

_____

DIETING PERCEPTIONS

1 _____ 2 _____ 3 _____ 4 _____ 5

never seldom sometimes often very often

Question	Response	Any Comments?
Over the past 6 months, have you wanted to: **67. lose weight?**	1 2 3 4 5	
68. lose weight for yourself?	1 2 3 4 5	
69. lose weight for family / partner?	1 2 3 4 5	
70. If you break an eating pattern that you would like to maintain (i.e., a diet) are you further inclined to eat more unhealthy food?	1 2 3 4 5	
To what extent do you believe that excess body weight is caused by: **71. lack of willpower**	1 2 3 4 5	
72. genetics	1 2 3 4 5	
73. luck, chance or fate?	1 2 3 4 5	

Any other comments regarding your dieting perceptions?

☐ Please tick the box if you are interested in participating in phase two of the study involving an interview of approximately one hour duration further discussing eating behaviour and mediating variables. If so, please provide your name and contact details below. These details are for contact purposes only, and will not be identifiable in the research publication.

Name:

Phone number:

Thank you for your time to participate in this research. Please return using the pre-paid envelope provided.

APPENDIX C

Means and Standard Deviations for Percentage of NHE

		Mean	SD
Weight	HWR	28%	17.1
	Overweight	41%	22.6
	Obese	41%	21.7
Gender	Females	43%	20.6
	Males	30%	17.9

APPENDIX D

Response Frequencies for the Question "If You Break an Eating Pattern That You Would Like to Maintain (i.e., a Diet) Are You Further Inclined to Eat More Unhealthy Food?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	12	13	14	3	1	43
	Overweight	1	3	5	1	1	11
	Obese	1	10	5	1	1	18
Gender	Females	6	17	19	4	2	48
	Males	8	9	5	1	1	24
Total		14	26	24	5	3	72

APPENDIX E

Response Frequencies for the Question "Do You Actually Buy Food (After Walking Past a Bakery)?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	5	24	12	1	1	43
	Overweight	2	6	2	1	0	11
	Obese	1	9	7	0	1	18
Gender	Females	5	23	16	2	2	48
	Males	3	16	5	0	0	24
Total		8	39	21	2	2	72

APPENDIX F

Response Frequencies for the Question “Do You Actually Buy Food (After Walking Past a Snack-bar / Cafe)?”

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	6	31	5	1	0	43
	Overweight	3	5	2	1	0	11
	Obese	0	13	4	0	1	18
Gender	Females	5	31	9	2	1	48
	Males	4	18	2	0	0	24
Total		9	49	11	2	1	72

APPENDIX G

Response Frequencies for the Question "When You Are Eating With Others, How Much Food do You Eat Compared to When You are Eating Alone?"

		Much less than usual	A little less than usual	About the same amount	A little more than usual	Much more than usual	Total
Weight	HWR	0	5	23	11	2	41
	Overweight	0	2	2	3	4	11
	Obese	0	2	10	5	0	17
Gender	Females	0	7	26	10	3	46
	Males	0	2	9	9	3	23
Total		0	9	35	19	6	69

APPENDIX H

Response Frequencies for the Question "Throughout the Course of a Typical Day (at Home and / or at Work), do You Usually Find That Food is Visible (a) Only at Mealtimes, (b) at Mealtimes and Some Other Times, or (c) Frequently Throughout the Day?"

		Only at mealtimes	Mealtimes and some other times	Frequently throughout the day	Total
Weight	HWR	9	17	17	43
	Overweight	4	4	3	11
	Obese	7	7	4	18
Gender	Females	13	15	20	48
	Males	7	13	4	24
Total		20	28	24	72

APPENDIX I

Response Frequencies for the Question “Do You Eat at Pre-determined Times of the Day?”

		Sever	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	6	8	15	9	5	43
	Overweight	1	3	0	5	2	11
	Obese	0	4	6	7	1	18
Gender	Females	7	10	13	15	3	48
	Males	0	5	8	6	5	24
Total		7	15	21	21	8	72

APPENDIX J

Response Frequencies for the Question "Do You Have the Desire to Eat When You Are Happy?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	13	11	12	7	0	43
	Overweight	0	3	5	3	0	11
	Obese	1	5	10	2	0	18
Gender	Females	9	13	16	10	0	48
	Males	5	6	11	2	0	24
Total		14	19	27	12	0	72

APPENDIX K

Response Frequencies for the Question "Do You Have the Desire to Eat When You Are Relaxed?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	13	9	16	5	0	43
	Overweight	0	1	7	3	0	11
	Obese	1	8	8	1	0	18
Gender	Females	7	11	23	7	0	48
	Males	7	7	8	2	0	24
Total		14	18	31	9	0	72

APPENDIX L

Response Frequencies for the Question "Do You Have the Desire to Eat When You Are Excited?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	18	12	11	1	1	43
	Overweight	2	3	4	3	0	11
	Obese	2	10	6	0	0	18
Gender	Females	14	18	14	1	1	48
	Males	8	7	7	2	0	24
Total		22	25	21	3	1	72

APPENDIX M

Response Frequencies for the Question "When You Have Eaten Too Much, do You Usually Feel (a) Guilty, (b) Ashamed, (c) Disgusted, (d) Satisfied, (e) Relaxed, (f) Relieved, (g) in High Spirits, or (h) Numb?"

		Weight			Gender		Total
		HWR	Overweight	Obese	Female	Male	
Negative	Guilty	49%	73%	33%	65%	17%	49%
	Ashamed	7%	18%	17%	15%	4%	11%
	Disgusted	21%	27%	22%	31%	4%	22%
Positive	Satisfied	35%	18%	44%	29%	46%	35%
	Relaxed	21%	9%	12%	8%	42%	19%
	Relieved	2%	0%	0%	2%	0%	1%
	In high spirits	0%	0%	11%	2%	4%	3%
Neutral	Numb	0%	0%	0%	0%	0%	0%

APPENDIX N

Response Frequencies for the Question "To What Extent do You Believe That Excess Body Weight is Caused by a Lack of Willpower?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	0	3	12	18	10	43
	Overweight	0	0	0	3	8	11
	Obese	0	2	5	6	5	18
Gender	Females	0	3	10	18	17	48
	Males	0	2	7	9	6	24
Total		0	5	17	27	23	72

APPENDIX O

Response Frequencies for the Question "To What Extent do You Believe That Excess Body Weight is caused by Genetics?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	3	7	16	16	1	43
	Overweight	0	5	4	2	0	11
	Obese	1	6	5	4	2	18
Gender	Females	2	10	21	12	3	48
	Males	2	8	4	10	0	24
Total		4	18	25	22	3	72

APPENDIX P

Response Frequencies for the Question "To What Extent do you Believe That Excess Body Weight is Caused by Luck, Chance or Fate?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	28	10	3	1	0	42
	Overweight	8	3	0	0	0	11
	Obese	5	5	4	1	3	18
Gender	Females	31	9	2	2	3	47
	Males	10	9	5	0	0	24
Total		41	18	7	2	3	71

APPENDIX Q

Response Frequencies for the Question "In the Past, to What Extent Were Your Family Members Overweight?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	11	16	10	5	1	43
	Overweight	1	2	5	0	2	10
	Obese	0	3	7	5	3	18
Total		12	21	22	10	6	71

APPENDIX R

Response Frequencies for the Question “Has Anyone in Your Family Experienced an Eating Disorder?”

		Yes	No	Unsure
Weight	HWR	7%	91%	2%
	Overweight	9%	81%	18%
	Obese	11%	83%	6%

APPENDIX S

Response Frequencies for the Question "In the Past, to What Extent Have You Been Conscious About the Type and Amount of Food You Eat?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	1	4	11	17	10	43
	Overweight	0	0	2	7	2	11
	Obese	1	4	3	6	4	18
Gender	Females	2	3	8	22	13	48
	Males	0	5	8	8	3	24
Total		2	8	16	30	16	72

APPENDIX T

Response Frequencies for the Question "In the Past, to What Extent Was Food Given as a Reward, an Incentive, or to Soothe Physical or Emotional Pain?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	16	14	12	0	1	43
	Overweight	3	3	1	2	2	11
	Obese	6	4	5	2	1	18
Gender	Females	13	15	13	3	4	48
	Males	12	6	5	1	0	24
Total		25	21	18	4	4	72

APPENDIX U

Response Frequencies for the Question "In the Past, to What Extent Was Tasty Food Denied Because it Was Unhealthy?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	13	9	13	7	0	42
	Overweight	6	1	4	0	0	11
	Obese	5	5	4	2	2	18
Gender	Females	17	11	10	8	2	48
	Males	7	4	11	1	0	23
Total		24	15	21	9	2	71

APPENDIX V

Response Frequencies for the Question “Do You Feel That You Eat Quickly?”

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	4	12	12	8	7	43
	Overweight	0	2	2	3	4	11
	Obese	1	2	4	6	5	18
Gender	Females	4	10	12	10	12	48
	Males	1	6	6	7	4	24
Total		5	16	18	17	16	72

APPENDIX W

Response Frequencies for the Question "How Often do You Binge Eat (Out of Controlled / Excessive Eating in a Short Period of Time)?"

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	17	18	8	0	0	43
	Overweight	2	7	2	0	0	11
	Obese	5	8	3	1	1	18
Gender	Females	14	23	10	0	1	48
	Males	10	10	3	1	0	24
Total		24	33	13	1	1	72

APPENDIX X

Response Frequencies for the Question “Do You Eat if You Wake During the Night?”

		Never	Seldom	Sometimes	Often	Very often	Total
Weight	HWR	36	6	1	0	0	43
	Overweight	10	1	0	0	0	11
	Obese	13	1	4	0	0	18
Gender	Females	42	3	3	0	0	48
	Males	17	5	2	0	0	24
Total		59	8	5	0	0	72

APPENDIX Y

Plain Language Statement (Study 2)

Dear Participant ,

My name is Michelle Cranston. I am currently completing a Doctorate of Sport Psychology at Victoria University, Footscray Campus, supervised by Dr Harriet Speed.

As part of my course, I am undertaking a study on eating behaviour. In particular I am interested in identifying why people begin and stop eating. Past research has shown that apart from hunger, eating can be triggered by internal cues (eg. habits and emotions), external cues (eg. taste, smell, social, availability), and through "yo-yo" dieting. Most studies so far have been relatively limited, as they have only studied one source of motivation during one eating setting. I am conducting interviews to explore eating behaviour, in order to obtain an overall perspective on why people eat. It is hoped that this study will provide a foundation for future research exploring eating behaviour that will result in identifying techniques that may assist individuals to lose weight. This study may also provide benefits to you by assisting in developing awareness of potential triggers that may cause you to overeat.

As a participant of my study, you will be asked to attend an interview of approximately 45 - 60 minutes duration. Personal information and interview recordings will be treated with upmost confidentiality by researchers. No individual will be identified in the report, as only group data will be used in the analysis.

As some people find discussing eating behaviour to be a sensitive topic, I understand that participating in this study may be uncomfortable. Participation is totally voluntary, and you are free to discontinue at any time without the need for reason or explanation. Although unlikely, if you do become distressed during the research process, you will be provided with the contact details of a counsellor who is aware of the nature of this study.

I thank you in advance for assisting me in my research. Should you have any concerns or queries about the research project, please do not hesitate to phone Dr Harriet Speed at Victoria University on 9919 5412. If at any stage you have concerns about the conduct of the research project, please contact the Victoria University Human Research Ethics Committee (ph: 9688 4710).

Yours sincerely,

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