ASSESSING CHILDREN'S BODY SHAPE AND WEIGHT CONCERNS

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The candidate confirms that the work submitted is her own and that appropriate credit has been given where reference has been made to work of others.

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ABSTRACT

Shape and weight over-concern and self-evaluation almost exclusively in these terms is a core feature of eating disorder psychopathology and it is this which is thought to drive weight control behaviours. The literature indicates concerns about weight and shape can be present in children at least as young as eight years of age. Currently, there is no tool available which measures a child's over-concern with their body shape and weight per se. This study developed an assessment of children's body shape and weight over-concern, using scales measuring shape and weight concern and perceived importance of shape and weight. The properties of the new shape and weight over-concern assessment were examined in relation to children's self-perception and implicit attitudes towards overweight.

Participants were 333 Year 5 children (181 boys and 152 girls) from North Yorkshire primary schools, with a mean age of 9 years 7 months. They completed measures of body shape perception, dietary restraint, height and weight accuracy, self-esteem and body shape and weight over-concern. In addition they completed a timed implicit association task which assessed implicit attitudes towards overweight.

The new assessment was concluded to have good psychometric properties and to be a reasonable assessment of shape and weight over-concern in children. Children with high shape and weight concern tended to be heavier, less satisfied with their weight and body shape, have lower self-esteem and report increased levels of dietary restraint. High levels of perceived importance of shape and weight also impacted on this latter variable. A general anti-fat bias was indicated from this group of children. Dietary restraint score was a significant predictor of shape and weight over-concern, as was global self-worth (for the boys) and physical appearance (for the girls). No gender differences were found in the assessment of shape and weight over-concern.

This study is the first to measure shape and weight over-concern in children and highlights a need of continued research of over-concern in children and adults. This will continue to inform intervention and prevention programmes of eating disorders. Further research into the implicit anti-fat attitudes in children as young as 9 years is also indicated, especially in respect of shape and weight over-concern.

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INTRODUCTION

1.1 EATING DISORDERS

The central manifestations of eating disorders in children, adolescents and adults are an excessive concern with the control of body weight and shape along with an inadequate and unhealthy pattern of eating (Bryant-Waugh and Lask, 1995a).

Within the term eating disorders two major syndromes are distinguished; anorexia nervosa and bulimia nervosa, with the former being characterised by weight loss and the latter by a cyclical pattern of bingeing and purging. Some diagnostic criteria (e.g. DSM-IV) also include a large and heterogeneous diagnostic category 'eating disorder not otherwise specified' (EDNOS) for individuals who have clinically significant eating disorders but who fail to meet all the diagnostic criteria for either of the two major syndromes. Such individuals can experience as complex and serious symptomatology as those with clear-cut anorexia or bulimia nervosa (Walsh and Garner, 1997). All of these disorders are associated with a variety of physical health hazards and reduced psychological well-being and have common psychological processes underlying them. All individuals with an eating disorder have a negative body image and experience chronic (if unsuccessful) dietary restraint. Eating and exercise patterns are often abnormal, and likewise hunger, appetite and satiety may be disturbed. Both bulimia and anorexia nervosa are predominately female conditions.

1.1.1 Prevalence and Morbidity of Eating Disorders

Eating disorders are relatively common place in adults and children and are on the increase. Estimates of incidence in adults lie between one and six per 100,000 of the population for anorexia nervosa (King, 1989) and over eight per 100,000 for bulimia nervosa (Hoek, 1991), whist in teenage girls, prevalence has been depicted as being around 1 and 3% (Szmukler and Patton, 1995). In recent decades awareness and knowledge of eating disorders has increased. Women are

more likely to develop eating disorders than men (by about eight to 11 times, Råstam, Gillberg & Garton, 1989, and Lucas, Beard, O'Fallon & Kurland, 1991), as are adolescent girls compared to boys (9:1 ratio) and pre-adolescent girls in comparison with boys (4:1 ratio, Bryant-Waugh and Lask, 1995b).

Eating disorders are known to be very disabling. In their less severe forms eating disorders produce distress with physical, psychological and social morbidity, and secondary psychiatric disorder, mainly depression. In their most severe forms they lead to disablement and sometimes death. (Royal College of Psychiatrists, 2000). The standardised mortality ratio for eating disorders has been estimated at 538, compared with 136 to 197 for depression, schizophrenia and alcoholism (Harris & Barraclough, 1998). The relatively high prevalence rates and clear disabling consequences of eating disorders, are indications for further investigation and research.

1.2 SHAPE AND WEIGHT CONCERNS IN EATING DISORDERS

Shape and weight over-concern and self-evaluation almost exclusively in these terms is a core feature of eating disorder psychopathology and it is this which is thought to drive weight control behaviours. Where usually self-worth is judged on the basis of performance in a variety of domains, people with anorexia nervosa and bulimia nervosa evaluate themselves primarily and sometimes entirely in terms of shape and weight. Cooper and Fairburn (1993) argue for the centrality of shape and weight concerns in eating disorders. They explain, that body shape dissatisfaction is a prominent feature of the psychopathology of eating disorders but it is not always present and dissatisfaction can be present in individuals without an eating disorder. However, overvalued ideas about shape and weight are "peculiar to bulimia nervosa and anorexia nervosa, relatively stable, closely related to patients' low self-esteem, and a necessary diagnostic feature of both disorders." (Pg. 388). This assertion is based on research evidence. For example, Hadigan and Walsh (1991) in examining the significance of shape and weight concern in bulimia nervosa in adults, found their data emphasised the importance of shape and weight over-concern as a diagnostic criterion for the disorder, with over-concern being more closely linked

with self-esteem than the severity of the symptomatology. Killen, Barr Taylor, Hayward and Haydel (1996) over a four-year period found weight concerns to be significantly associated with onset of eating disorder psychopathology in adolescent girls. Girls with weight concern scores in the top quartile, had the highest incidence of onset of eating disordered psychopathology, whilst the lowest quartile did not develop any symptoms. Furthermore, Bryant-Waugh, Cooper, Taylor and Lask (1996) in examining the efficacy of the modified Eating Disorder Examination in seven to 14-year-old children with eating disorders, also found overvalued weight and/or shape concerns important in terms of self-evaluation in the majority of children with anorexia nervosa.

Fairburn's cognitive model of the maintenance of bulimia nervosa (see Figure 1) places body shape and weight over-concern as a core feature of the disorder and also as a central characteristic of anorexia nervosa. This is because shape and weight over-concern is thought to lead to many of the remaining features found in eating disorders. These include dieting, other weight control behaviours and preoccupation with thoughts of food, eating, shape and weight but not binge eating, which is not seen as a direct expression of shape and weight over-concern. Long-standing low self-esteem in an individual, a second core characteristic of both anorexia nervosa and bulimia nervosa, can lead individuals to evaluate themselves largely in terms of their shape and weight. This is thought to be due to appearance and weight being seen as more controllable than other areas in life and because dieting and weight loss are socially acceptable practices. Hence, such individuals aim to increase their self-esteem through evaluating themselves more positively by becoming thinner. However, their fundamental low self-esteem feeds into a persistent dissatisfaction with their appearance and weight, resulting in a continual drive for thinness.

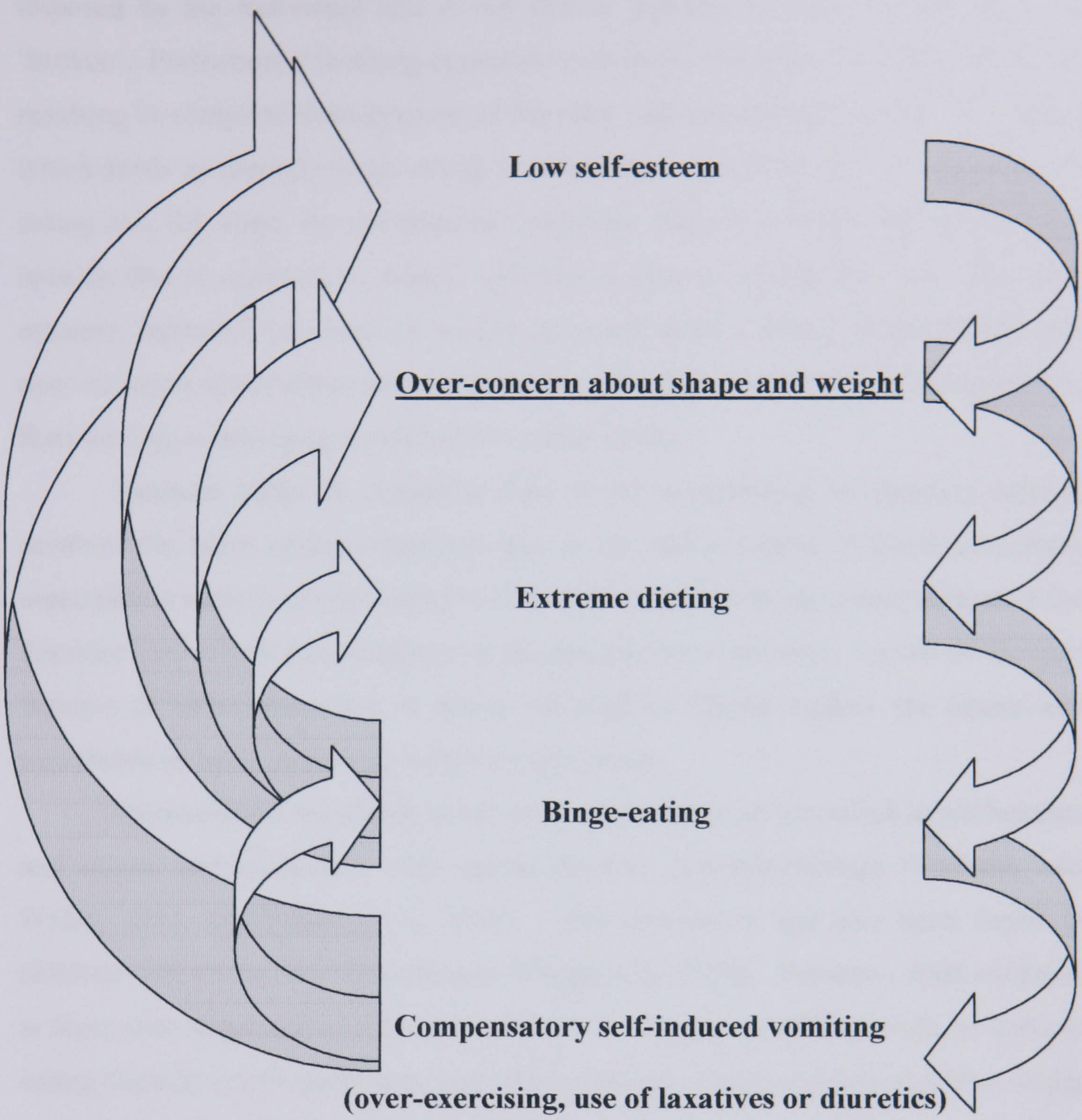


Figure 1. Fairburn's cognitive view of the maintenance of bulimia nervosa (Fairburn, 1997).

The rigid and intense dieting found in anorexia and bulimia nervosa results from perfectionist and dichotomous (black and white) thinking, commonly found in individuals with eating disorders and can be seen in many aspects of their lives, not just dieting. Strict dietary rules on when, what and the amount they should eat are

imposed by the individual and if not strictly adhered to are perceived as being 'broken'. Perfectionist thinking interprets such inevitable lapses as complete failure, resulting in complete abandonment of the rules and hence binge eating. Low mood which tends to precede binge eating is momentarily relieved due to aspects of the eating and, for some, the self-induced vomiting. However, by the end of the binge episode this is replaced by regret, self-disgust (hence feeding back into low self-esteem), increased concerns of weight gain and fatness (hence feeding back into over-concerns about shape and weight) and individuals become more determined in their dieting, establishing a number of vicious circles.

Fairburn states the cognitive view of the maintenance of anorexia nervosa involves the same central characteristics as the above model of bulimia nervosa, especially in respect of over-concern of weight and shape being a core feature of the disorder from which many features of the disorder are secondary. As one of the core features of eating disorders, it seems essential to further explore the nature and prevalence of body shape and weight over-concern.

Over-concern with body shape and weight has been identified in adolescents and adults and associated with eating disorder psychopathology (Hadigan and Walsh, 1991, and Killen et al, 1996). This association has also been found in children with eating disorders (Bryant-Waugh et al, 1996). However, what evidence is there that shape and weight over-concern is present in children with or without eating disorder psychopathology and, if it is present, which children is it most likely to be found in? What follows is a review of the research literature available on children and their concerns about shape and weight, which include body dissatisfaction and dieting, not solely over-concern.

1.3 SHAPE AND WEIGHT CONCERNS IN CHILDREN

Collins (1991) was one of the first to identify shape concerns in pre-adolescents. Scaled drawings of male or female figures ranging from thin to obese were used, and children (with a mean age of eight) were asked to identify their current and ideal figure choices. The study found girls expressed more

dissatisfaction with their body shape than boys. Such gender differences have been replicated in studies of similar aged children from the UK, America and Australia. For example, Hill, Draper and Stack (1994) found 41% of nine-year-old girls placed their preferred body shape at a thinner point than their current shape, in contrast to 28% of the boys. However, 41% of the boys identified their ideal at a broader point than their current shape. Brodie, Bagley and Slade's (1994) study used a distorting mirror method together with the scaled drawings with nine and 14-year-old girls, and they found the girls reported shape concerns but no age differences were evident in this. Maloney, McGuire, Daniels and Specker (1989) using a children's version of the Eating Attitudes Test (ChEAT), found 55% of girls answered yes to "Have you ever wanted to be thinner?" compared to 34% of the boys. However, they also found nearly twice as many older girls answered yes compared to the younger girls.

Body shape and weight dissatisfaction has been shown to be higher in overweight 15-year-old girls compared to those that were not, although these concerns were expressed in all weight categories (Wadden, Foster, Stunkard, and Linowitz, 1989). This finding was replicated in nine-year-olds by Hill et al (1994), who also found the gender difference disappeared in the heaviest category with 80% of boys and girls indicating a desire to be thinner.

In an examination of whether early dieting reports are present with body shape and weight concerns, Hill, Oliver and Rogers (1992) studied the relationship of the self-perception of nine and 14 year old girls and their self-reported dieting behaviours. No age differences were found in restraint, but the older girls described more overall body dissatisfaction. Furthermore, girls reporting high dietary restraint were significantly more dissatisfied with their weight, build and specific body areas. Their preferred body shape was significantly slimmer than their current figure, unlike the unrestrained group. Moreover, the highly restrained girls were significantly heavier than the unrestrained group. The study showed girls who were not overweight but dieting did so due to having a poor self-perception of their body shape and weight. Hill and Pallin (1998) found self-ratings of dieting practices were significantly related to eight-year-old boys and girls discontent with their appearance. For the girls this reported dieting was also related to characteristics of

low self-esteem. In the US, Flannery-Schroeder and Chrisler (1996) found children as young as seven years of age, were expressing dieting and weight concerns and engaging in eating disordered behaviours, however this has not been replicated. Hill (1993, 2002) states these studies indicate girls, sometimes before eight years of age. will try to improve their feelings of self-worth by controlling their weight.

To summarise, body shape and weight concerns are more likely to be found in girls, children who are overweight and children who have low self-esteem. Although age differences are not clear, the literature indicates concerns over weight and shape can be present in children at least as young as eight years. Dietary restraint appears to be an expression of shape and weight concerns and has been reported by primary schoolchildren.

But, how are shape and weight concerns acquired, how do children learn about society's perceptions of shape and weight, and how do they learn about methods of weight control?

1.4 INFLUENCES OF SHAPE AND WEIGHT CONCERNS IN CHILDREN

Stice (1994) discusses appearance-based socio-cultural pressures on individuals and their role in the promotion of eating disorders, specifically bulimia nervosa. He categorises these pressures into: the thin-ideal body for women; the centrality of appearance in the female gender-role; and the importance of appearance for societal success. A review of the literature led Stice to conclude the ideal body image for women has become increasingly thin paralleled by a corresponding increase in the numbers of diet articles and advertisements in women's magazines. He states that appearance is a central component of the female gender role and attractiveness is important for women's societal success. Stice goes on to theorise that there are three primary carriers of the socio-cultural themes, which influence children and adults' body shape and weight concerns and weight control behaviours. These have been identified as the family, peers and the media, and a review of each, in respect of children and adolescents, follows.

1.4.1 Family

As a route of transmission and acquisition the family has a significant impact, and a large part of this is the impact of a parent, especially the mother. Pike and Rodin (1991) compared mothers of 16-year-old girls who were rated highly as having symptoms of disordered eating, with mothers of same aged girls who had low scores of disordered eating. They found the former group of mothers to have significantly higher scores on measures of drive for thinness, bulimia and body dissatisfaction. Hill, Weaver and Blundell (1990) obtained similar findings in younger girls (aged 10 years), where a strong association was found between the level of dietary restraint reported by the girls and their mothers. They concluded that girls appeared to be modelling their mothers' dieting behaviour alongside learning and giving the same reasons for dieting failure. Even in eight-year-olds dieting awareness is predicted by the children's perception of whether their mothers would diet if they felt fat (Hill & Palin, 1998).

However, Hill (2002) argues that it is over-simplistic to explain these findings as being a mechanism of simple modelling of mothers current concerns. Studies have shown that parents can be active as well as passive in conveying weight concerns to their children. Dieting in nine and ten-year-old girls has been found to be positively associated with parental encouragement to control weight (Thelen & Cormier, 1995) and parents who have been on a diet, compared to those who have not, were more likely to have tried to help their child to lose weight (Striegel-Moore & Kearney-Cooke, 1994). Smolak, Levine and Schermeer (1999) found direct parental comments, especially by the mother, to nine to 11-year-old children seemed to be more powerful influences than did parental modelling of weight and shape concerns, although the latter did affect the child's beliefs and behaviours. Lein (2000) explored attachment patterns and perceived parental weight expectations in relation to weight concerns between pre-adolescent girls and their parents. She found that girls who perceived their parents as having high expectations on them to control or lose weight had a higher degree of weight concerns, and furthermore, the fathers' expectations played more of a dominant role in predicting the girls' degree of weight concerns. This reinforces conclusions (Hill, 2002) made on the

importance of the child's perception of parental involvement compared to what is reported by parents themselves. Moreover, the Lein study supports other research emphasising the role of the father's pressure for thinness (Shisslak, Crago, McKnight et al, 1998), their own weight dissatisfaction or comments made about their daughter's weight (Keel, Heatherton, Harnden & Hornig, 1997) in contributing to their daughters' weight concerns.

Other than perception of family functioning there is very little research on the role of other family members, such as siblings, in the transmission of the socio-cultural pressures. However, this does not necessarily reflect the lack of importance of this area.

There are studies which have found daughters and their mothers with high levels of weight concern (Pike & Rodin, 1991) or who reported dieting (Hill & Franklin, 1998), desire increased family cohesion or are less satisfied with the current cohesion, family organisation and moral-religious emphasis. Hill (2002) highlights the importance of the dynamic nature of family functioning, with dissatisfactions in self-perception having the potential to influence dissatisfactions in other domains, and vice versa.

1.4.2 Peers

As children's social support moves towards peers and away from parents, the role of peers in the transmission and acquisition of weight and shape socio-cultural issues increases with age (Hill, 2002). Paxton (1996) has reviewed the literature on peer influences on adolescent dieting, there being little investigation in this area in pre-adolescent children. The review highlights the common place discussions about weight and dieting in adolescent peer group interactions, which serve to give and receive weight control information and advice, as well as highlight issues such as the importance of being thin and sharing negative perceptions regarding particular body areas. The fact these are shared increases their normative value in the perceptions of adolescents. Paxton, Schutz, Wertheim & Muir (1999) found the level of body image concerns, dieting and extreme weight loss behaviours were more similar within adolescent friendship groupings than between them. The few studies

undertaken in younger age groups do show some evidence that peer opinion and behaviour are important before adolescence (Levine. Smolak, Moodey, Shuman & Hessen, 1994, and Barr Taylor, Sharp, Shisslak et al, 1998) but it is unclear how these are mediated.

Differences in age have been shown in the role of peer teasing. Where peer teasing about weight has been shown to predict weight concern in 11 to 15-year-old girls, it has not been shown to have an impact on weight concerns in nine to 12-year-olds (Barr Taylor et al, 1998). In a study focusing on teasing about being overweight in 12-year-old children, Hill and Murphy (1999) found 12% of girls and 16% of boys reported being victimised for being overweight. These children were heavier than those children who did not report being victimised and there was a significant association between the victimisation and dietary restraint and a range of weight loss behaviours.

Peer behaviour is clearly relevant to early weight concern and dieting. Gender differences in weight-related talk and teasing vary in that girls perceive being attractive as relatively more important than boys and there is a fluctuation of this perception with age. Therefore, girls engage more in weight-related talk than boys and boys engage more in weight-related teasing towards girls than vice versa (Hill and Murphy, 1999). Being teased for being overweight also appears to increase the likelihood of teasing for other reasons. The complexity of these functions of peer behaviour warrants further research.

1.4.3 Media

Research into the impact of exposure to media which reinforces the thin ideal on the development of shape and weight concerns or dieting, has been problematic and difficulties have been encountered. Thereby, it has been difficult to conclude that there is an association between the two. For example, Field, Cheung, Wolf, Herzog, Gortmaker and Colditz (1999) found girls (aged nine to 17 years) who were frequent readers of women's fashion magazines were two to three times more likely than infrequent readers to report dieting or exercising because of a magazine article, and to agree that magazines influence what they believe is the ideal body shape.

However, there is a problem of causality which prevents this study being used to indicate there is an impact of fashion magazines on the initiation of weight and shape concerns. In contrast, Champion and Furnham's study (1999) of exposing pictures of thin and overweight women to 12, 14 and 16-year-old girls, did not find, as was expected, that the exposure effected the girl's self-perception. They explained this in terms of there being a weakness in the brief exposure to media images in comparison with everyday exposure which tends to be continuous and often unnoticed.

However, what the research does indicate, is studies that establish individual's pre-existing weight and shape concerns have found those with existing shape and weight concern are more likely to be affected by exposure to such media content (Sherwood & Neumark-Sztainer, 2001). Therefore, the research indicates that a change in focus is needed. For example, emphasis needs to be placed on identifying the characteristics of children which increase their vulnerability to media messages, rather than identifying media types which influence shape and weight concerns of children (Lewis and Hill, 1998). Social comparison theory, for example (Waller and Shaw, 1994), highlights a need for children to use others as a source of information about body shape ideals in order to evaluate their own attitudes and self-perception of body shape. Therefore a child with high social comparison needs is more likely to use and more likely to be sensitive to media images and messages. They are therefore more likely to use media sources to evaluate their own body image.

Applying this theory, Martin and Kennedy (1993) found a brief exposure to pictures of highly attractive models raised the comparison standards for physical attractiveness in adolescent girls but not in 10-year-olds. Hence, although a 'standard' model's perceived attractiveness was dependent on the attractiveness of a preceding set of fashion images the girls' own self-perception was not changed. Atchison (1999) repeated these findings for ratings of thinness in 10-year-old girls. There are possible explanations as to why self-perception is not affected by fashion images but perceptions of an 'ambiguous' individual are. Firstly, exposure to the images was brief and so not comparable to everyday media exposure which is

known to be more continuous, often unnoticed and repetitive. Secondly, central beliefs such as shape and weight self-perceptions have an enduring nature which makes them resistant to change at a superficial level. Significantly, a recent report from the BMA Board of Science and Education (2000) on 'Eating disorders, body image and the media' recommends "more research into the subject of the media .... particularly the impact on perceptions of body shape and healthy eating."

The literature on body shape and weight concerns in children provides clear evidence of shape and weight concerns in pre-adolescent children. Moreover, there is evidence to support the argument that socio-cultural pressures to be thin and be concerned with shape and weight are absorbed by children through three primary carriers; family, peers and the media; which are all highly important and influential parts of a child's system. With this knowledge it would be expected that primary prevention programmes have been developed in addressing eating disorder psychopathology if not specifically on body shape and weight concerns. Therefore, what prevention programmes have been developed and how effective are they?

1.5 THE PROBLEM OF PREVENTION

Prevention programmes focusing on changing the presence of eating disorder psychopathology through addressing body dissatisfaction and dieting in children have so far been largely unsuccessful. They usually have taken the format of teaching sessions delivered to class groups of adolescents (i.e. school-based primary prevention), but on evaluation have shown to have little impact. On the whole they are shown to be effective in increasing knowledge in the area, have little, if any, effect on eating, body shape or weight attitudes and are very poor at changing weight control behaviours (e.g. Killen, Barr Taylor, Hammer, et al 1993).

In answer to whether the programmes had been targeted at the wrong age group, Smolak, Levine and Schermer (1998) demonstrated similar findings for nine-year-old children. Another explanation for such interventions being unsuccessful could be the lack of an appropriate outcome measure. Due to the very low rates of new eating disorder cases it is difficult to show an impact on the rate of eating

disorder diagnosis, i.e. assessing true efficacy. Therefore, other measures have been used to evaluate outcome which tap into the knowledge, attitudes and behaviours related to eating disorders. The most common has been dieting which has become directly associated with eating disorders, and is assessed as such when treating individuals with eating disorders. However, in a society where obesity in children and adults is escalating, the association of dieting to eating disorders is too simplified, indicating that dieting is not an appropriate or effective outcome measure. Furthermore, dieting can not be identified as being a major risk factor for eating disorder onset in pre-adolescents, simply because this has been identified in adolescents. Rather, concerns with weight regulatory behaviours could be an indicator of vulnerability to acquiring an eating disorder later in life if combined with other risk factors (Levine and Smolak, 1992).

If an effective outcome measure can be developed that reliably and validly assesses a known risk factor for eating disorder psychopathology, then future primary prevention programmes aimed at reducing risk factors and increasing young people's resistance to them can be objectively evaluated. It is important such an outcome measure is in place before recommendations made from the BMA Board of Science and Education (2000) are put into practice. They concluded prevention programmes within the school curriculum are needed, to increase awareness of issues relating to body image, self-esteem and pressure to diet.

1.6 THE ASSESSMENT OF BODY SHAPE AND WEIGHT OVER-CONCERN

As previously argued, dieting and other weight regulatory behaviours are known to be associated with, and are likely to be an expression of, shape and weight over-concern (Hill et al 1992). Shape and weight over-concern has been shown to be a core characteristic of eating disorder psychopathology. There is evidence to support the existence of general shape and weight concerns (including body dissatisfaction and dieting) in primary schoolchildren. Over-concern of shape and weight as conceptualised by Fairburn (1997) in the maintenance of anorexia and

bulimia nervosa is specific and extreme and is quite different in its nature compared to general shape and weight concerns.

Body shape and weight over-concern can be operationalised as shape and weight worry (or concern) and high perceived importance of shape and weight. Therefore a child (or adult) who perceives shape and weight as important and who also worries about their shape and weight can be described as having shape and weight over-concern. Hence, if shape and weight worries and perceived importance can be assessed separately, children can then be identified as having body shape and weight over-concern.

An outcome measure of body shape and weight over-concern would be a more effective and appropriate means of assessing the efficacy of a primary prevention programme. Alongside this, targeting shape and weight over-concern in prevention programmes would also seem pertinent and by doing so would improve the effectiveness of the intervention. It follows that body shape and weight over-concern in children is an area where more research is required. More specifically, there is a need for the development of a measure which assesses shape and weight over-concern in children.

1.6.1 Available measurements relating to body shape and weight over-concern

Currently there is no tool available which measures a child's over-concern of their body shape and weight per se. However, the following are examples of questionnaire assessments of eating disorder psychopathology relating to body shape and weight concern in children, adolescents or adults.

A self-report questionnaire designed to assess assumptions and beliefs associated with eating disorders in adults was developed by Cooper, Cohen-Tovee, Todd, Wells and Tovee (1997). The 32-item questionnaire uses statements of beliefs which the individual has to rate using a visual analogue scale (0-100). The end points are anchored at 'I do not usually believe this at all' and 'I am usually completely convinced that this is true'. The respondents are asked to base their replies on 'what you emotionally believe or feel, not on what you rationally believe to be true' and 'to choose the rating that best describes what you usually believe or

what you believe most of the time`. Factor analysis suggested a replicable four-factor structure consisting of the following dimensions: negative self-beliefs; weight and shape as a means to acceptance by others; weight and shape as a means to self-acceptance; and control of over-eating. The questionnaire was shown to distinguish adults with eating disorders from normal controls.

The 'My worries' measure (Wadden, Brown, Foster and Linowitz, 1991) is a 15-item questionnaire using a 10-point scale, and asks how often male and female high school students worry over specific issues, including appearance, shape, weight, popularity, money and relationships. The measure has been adapted to measure intensity (how much) as well as frequency (how often) of these 15 worries. Wadden et al found some gender differences in what the children worried about. For example, girls worried most about shape and weight in contrast to boys, and girls reported significantly greater worry than boys on nine out of 15 items. Obese boys and girls reported worrying significantly more about weight and figure than did their non-obese peers, but being overweight was otherwise unrelated to trait anxiety or worry about other issues. As expected from the literature shape and weight concern were more prevalent in female and heavier children.

The adolescent version of the Shape and Weight-Based Self-Esteem inventory (SAWBS-A) (Geller, Srikameswaran, Cockrell, and Zaitsoff, 2000) assesses the contribution of shape and weight to overall feelings of self-worth, in the context of other dimensions on which self-esteem is based. This study examined the psychometric properties of the SAWBS-A inventory in adolescent females and compared structural aspects of self-concept in symptomatic and non-symptomatic individuals. Individuals select and rank order a list of attributes that are important to their feelings of self-worth. The choices include intimate or romantic relationships (intimate), body shape and weight (body), competence at school (school), personality (personality), friendships (friends), face (face), personal development (develop), competence at activities other than school work (other comp), and other. They then divide a circle into pieces, such that the size of each piece reflects the importance of each attribute to overall feelings of self-worth. The SAWBS-A score is the angle, in degrees, of the shape and weight piece. Geller et al found scores

discriminated between adolescents reporting few or no disturbed eating symptoms and possible / probable cases. Comparison of self-esteem profiles in these two groups revealed that in addition to body, the groups differed in the extent to which facial appearance contributed to feelings of self-worth. This measure appears to be able to assess the importance of shape and weight in children in relation to their feelings of self-worth in comparison to other attributes.

Stewart (2000) developed a measure used clinically in identifying and challenging distorted or unhelpful beliefs and in developing a positive sense of self. It is similar to Geller et al (2000) in that it uses similar attributes, asks the child to select and rank order the attributes and then asks them to divide a circle into pieces so the size of each piece reflects the importance of each attribute. It is also scored by the angle, in degrees. However, Stewart uses three different circles one representing who they are currently, one representing what they value about themselves and the third representing what they would like to be. This measure can assess shape and weight concern in children, in relation to their feelings of self-worth in comparison to other attributes, if a discrepancy is measured between what they would like to be and what they feel they are currently. In this aspect this method has similarities to that developed by Harter (1985a) – see later.

Finally, the Eating Disorder Examination Questionnaire (EDE-Q) (Fairburn and Beglin, 1994) is a self-report questionnaire version of the Eating Disorder Examination (EDE) (an investigator-based interview, Fairburn and Cooper, 1993). It is scored the same way as the EDE and has two functions. Firstly, it permits the diagnosis of eating disorders by asking questions specific to key behavioural features, and secondly, it measures eating disorder psychopathology. It has two specific subscales on shape concern and weight concern and two others on eating concern, restraint or dieting.

1.6.2 Assessment of body shape and weight over-concern in children

Harter (1985b) views self-esteem as multidimensional, comprised of separate evaluations of competence in specific domains as well as evaluations of

global self-worth. She argues that self-esteem is related to the discrepancy between competence and importance in the various domains, whereby perceived competence or adequacy in domains rated as important is strongly predictive of self-worth. From this she has developed a measure of self-esteem, the Self-Perception Profile for Children (SPPC, Harter, 1985a) which is a 36-item questionnaire with six subscales that distinguish global self-worth from competence in five specific domains. These are scholastic competence, social acceptance, athletic competence, physical appearance and behavioural conduct. An additional ten-item scale, presented separately, measures the child's perceived importance of each domain. The concurrent use of both measures permits the discrepancy between a child's own competence and perceived importance to be calculated across the domains, hence only measuring how adequate the child feels in those areas judged as important. Developed for use with children aged 8-14 years, this questionnaire has good sub-scale reliabilities.

Mendelson, Mendelson and Andrews (2000) further explored Harter's theory, namely, that global self-worth is determined by an interaction of an individual's feelings of adequacy in a range of domains, with the individual's rating of importance for each of the domains. They labeled this the 'Competence X Importance' model and explored this whilst investigating adolescent self-esteem, body esteem and the importance attributed to three body-esteem domains (weight, appearance and others' evaluations of one's appearance). They concluded that "consistent with the Competence X Importance model, individuals who had relatively large BMI and who thought that weight was important were apt to have low global self-esteem and to rate their appearance low" (Pg. 263). This clearly emphasises the role of perceived importance in evaluating self in terms of self-worth and its increased impact when interacting with perceived competence in the same domain. Furthermore, Darnall, Smith, Craighead and Lamounier (1999) found in female adolescents increased weight concern to be associated with lower self-esteem, which in turn was found to be correlated with greater perceived importance of shape and weight. The areas of perceived importance of weight and weight concern can be seen to have a link with self-esteem in a way that Fairburn argues

that over-concern with shape and weight links in with self-esteem. This reinforces the conceptualisation of body shape and weight over-concern as being one of concern and perceived importance.

In terms of assessment methodology, Austin and Joseph (1996) developed two six-item self-report scales (the Bullying-Behaviour Scale and the Peer-Victimisation Scale) to assess bully-victim problems at school. The scales were designed so that they could be immersed within the Self-Perception Profile for Children (SPPC, Harter, 1985a) to reduce the saliency of the items. They wanted to investigate the scales' internal reliabilities and associations with scores on the SPPC and the Birleson Depression Inventory. Using the two scales they were able to classify children into victims only, bullies only or both bullies and victims and investigated the similarities and differences between the children in the three groups. Austin and Joseph used a cut-off score of 2.50 or above to identify bullies or victims and distribute them into their respective groups. Internal reliability of both scales was found to be satisfactory. Higher scores on the Peer-Victimisation Scale were associated with lower scores on all the SPPC subscales and higher scores on depression. Higher scores on the Bullying-Behaviour Scale were associated with lower global self-worth, and lower scores on scholastic competence, social acceptance and behaviour conduct. Higher scores on the Bullying-Behaviour Scale were associated with higher scores on depression for boys but not girls.

As body shape and weight over-concern can be operationalised as shape and weight worry (or concern) and high perceived importance of shape and weight, the current study devised two six-item self-report scales to measure these two constructs. Similar to Austin and Joseph (1996) they were then immersed into the SPPC (Harter, 1985a) as additional domains to the five specific domains already used. The items for both scales were drawn from the questions forming the shape concern and weight concern subscales from the EDE-Q. The key themes drawn out from the items chosen from the EDE-Q were incorporated into both the shape and weight worries and perceived importance domains in the SPPC. (See Appendix 1 for a table of all the items within the shape concern and weight concern subscales and the subsequent ones chosen to inform the shape and weight concern and

perceived importance scales.) The themes (with the EDE-Q question number in brackets) were: fear of gaining weight or becoming fat (12); being dissatisfied with your weight or shape (33 & 34); feeling uncomfortable about seeing your body in a mirror (35); feeling fat (13); and having a strong desire to lose weight (14). Items within both the new scales used the same themes. The wording differed to highlight 'being worried' about an issue or 'thinking it is important'. A table of the new shape and weight items with the corresponding items from the EDE-Q from which the themes were drawn can be found in Appendix 2. The items assessing shape and weight worries were numbered 3,7,11,15,19,23 in the revised SPPC and the items assessing shape and weight perceived importance were numbered 27,31,35,39,43,47. The items can be found in Appendix 3 and the complete SPPC measure in Appendix 4.

The same cut-off scores used by Austin and Joseph (2.50) were used with the shape and weight concern and shape and weight perceived importance scales. Hence the children were classified as those who have shape and weight worries, those who perceive shape and weight to be important when examining self-worth, those who have neither, and those who have both shape and weight worries and perceive them to have high importance (i.e. are over-concerned with shape and weight).

Looking at this issue in a different way, it is of note that Doll and Fairburn (1998) reported heightened accuracy of self-reported weight in adults with eating disorders. This accuracy was not found in healthy control subjects who reported a discrepancy between their subjective and measured values of height and weight. It was concluded these results supported the hypothesis that the intense interest of individuals with eating disorders in their weight is expressed by heightened precision of their self-report. Therefore it could be hypothesised that children reporting body shape and weight over-concern would also have heightened accuracy of self-reported weight. Accordingly, in this study, children were asked to self-report their height and weight as an additional means of assessing body shape and weight over-concern. This stems from the hypothesis that children reporting shape

and weight over-concern will have heightened accuracy of self-reported height and weight.

In summary, one aim of this study was to investigate the properties of the two body shape and weight scales (concern and perceived importance) especially in relation to children's self-perception.

1.7 STIGMATISATION OF OBESITY

1.7.1 Obesity, prevalence and morbidity

Obesity is defined as a condition of being significantly overweight (Romano and Quinn, 1995) as measured by the Body Mass Index (BMI). BMI is measured by the following calculation: weight (kg) / height^2 (m). Overweight is usually classified as having a BMI between 25 and 29.9, whilst obesity is classified as having a BMI of 30 or more (The Department of Health, 1995).

A recent report from the National Audit Office (NAO, 2001) states by 1998 the prevalence of obesity had nearly trebled since 1980 when 8% of women were classified as obese and 6% of men. In 1998, 17% of men and 21% of women in England were classified as obese. A continued increase is expected and reflects a world-wide trend most marked in, but not restricted to, developed countries. Over half of women and around two-thirds of men are either overweight or obese (NAO). The increase in prevalence is also found in primary schoolchildren. Rudolf, Sahota, Barth and Walker (2001) found a significant increase in the proportion of overweight and obese children aged nine to 11 years in England from 1996 to 1999, with one in five nine-year-olds and one in three 11-year-olds being classified as overweight in 1999. Even younger populations are showing an increase in the proportion of overweight and obese children. For example, Bundred, Kitchiner and Buchan, 2001, found the proportion of obese four year olds and under to increase from 5.4% to 9.2%, from 1989 to 1998.

Research has indicated that a BMI greater than 25 increases the risk of physical illness, including stroke, cancer, diabetes, heart disease, gall bladder problems and hypertension. A BMI greater than 30 is believed to greatly increase

risks of mortality. The National Audit Office (2001) estimate 30,000 deaths a year in England are due to obesity with such deaths being estimated, on average, to shorten life by nine years. Two concerns with childhood obesity lie in obesity being tracked from childhood to adulthood and in obesity in adolescence being directly associated with increased morbidity and mortality in adult life, independent of adult body weight (Rudolf et al, 2001).

1.7.2 Stigmatisation in adults

Stigma is defined by Goffman (1963) as negative attitudes which colour interpersonal interactions. Stigmatisation of adults who are obese can be seen to have a number of consequences. Research in this area clearly outlines discrimination against obese individuals across many areas of everyday living.

Studies which have investigated weight-based discrimination in employment have pointed to prejudice, insensitivity and inequity in work settings (Puhl and Brownell, 2001). In a study of job applicants for sales and business positions, Rothblum, Miller & Garbutt (1988) found more negative judgments were made for obese women than for non-obese women. The authors concluded that obese applicants remain vulnerable to negative evaluations because of their weight. Employability has been shown to be seriously affected by being over weight (Klassen, Jasper and Harris, 1993; Larkin and Pines, 1979; and Klesges, Klem and Hanson, 1990). Roehling's review (1999) of research of work-related stereotypes of overweight employees indicated assumptions were made of such individuals being lazy, lacking self-discipline, being less competent, sloppy, disagreeable and emotionally unstable. It comes as no surprise then that additional research has shown obese employees to be paid less than their thinner counterparts (Register and Williams, 1990, and Pagan &Davila, 1997), to have lower promotion prospects (Brink, 1988) and be suspended or have their jobs terminated due to being overweight (Rothblaum, Brand, Miller and Oetjen, 1990; and Garcia, 1995). In the UK there is no legislation preventing discrimination in the workplace based upon weight.

Other consequences of being obese include more general psychological, emotional and social difficulties, indicating stigmatisation of obesity can invade all areas of an individual's life. Allon (1982) identified being overweight as socially depicted as slothful and undesirable and stated these stereotypes are reinforced socio-culturally.

The pervasiveness of the stigmatisation of obesity is very evident when examining studies on health-care professionals' attitudes towards individuals who are obese. A third of physicians listed obesity, when asked to list five diagnoses or patient characteristics to which they responded negatively, making it the fourth most common category. They associated obese individuals with poor hygiene, non-compliance, hostility and dishonesty (Klein, Najman, Kohrman & Munro, 1982). Sixty-three percent of nurses in one study (Maroney & Golub, 1992) felt obesity could be prevented by self-control. Nearly half of the nurses felt uncomfortable caring for obese patients, where as just under a third preferred not to care for an obese patient at all. Some of the descriptions for obese individuals used by the nurses included, unsuccessful, overindulgent, lazy and as experiencing unresolved anger. Poor obesity management practices as found by Kristeller and Hoerr (1997) and a reluctance for obese individuals to seek health care (Olson, Shumaker and Yawn, 1994) could be consequential of such negative attitudes.

Teachman and Brownell (2001) have further investigated this area by examining whether obesity treatment specialists had negative implicit anti-fat attitudes and beliefs towards obese individuals, and if so, how they compare to the attitudes of the general population. They argued that explicit attitudes could be and often were adjusted by individuals when they felt it was not appropriate to report negative attitudes. Moreover, they felt people who wish to be unbiased may still be affected by societal messages and may not realise they hold negative attitudes. Therefore, they stated there was a need to assess individuals' implicit attitudes which were unconscious and not so easily changed. (A more detailed discussion of explicit and implicit attitudes can be found later). Researching this area was thought to be important as demonstration of an anti-fat bias among health care professionals

would further highlight the pervasiveness of weight bias in society, and had important implications in the delivery of health care to such individuals.

Teachman and Brownell assessed negative implicit and explicit attitudes of health care professionals using a series of attitude and belief measures about thin and obese persons. These were compared to the same measures obtained from a general population sample. They found clear evidence for an implicit anti-fat bias in the obesity treatment specialists, which although strong was significantly below the bias measured in the general population. However, only minimal evidence was found for an explicit anti-fat bias. They concluded that even health-care specialists who work with obese people had strong negative associations towards obesity, indicating the pervasiveness of the stigma toward obesity. However, they felt there appeared to be a 'buffering factor' related to their experience which reduced this bias. The usefulness of this method in accessing implicit attitudes of individuals towards obesity is highlighted, specifically in individuals who either do not believe they hold such negative attitudes or who are aware it would be inappropriate to report them.

1.7.3 Stigmatisation in children

Pierce and Wardle (1997) found nine-year-old clinically overweight children reported significantly lower self-esteem than their non-overweight peers and believed weight to be the reason why they were teased, had fewer friends and were excluded from games and sports. This rejection was also found in overweight adolescent girls (Neumark-Sztainer, Story & Faibisch, 1998), most commonly from their peers and whilst at school. This does not come as a surprise when examining the literature on stigma and obesity in children. A number of studies have identified different personality characteristics attached by children to different body shapes, and on the whole fat figures were assigned negative characteristics and thin figures were attributed with positive qualities (Staffieri, 1967).

In a study specifically examining nine-year-olds perception of health and fitness (Hill & Silver, 1995), fat boy and girl figures were perceived as being extremely unhealthy, very unfit and very unlikely to eat healthy food compared to thin figures. In addition, overweight figures were rated as having fewer friends,

being less liked by their parents, being very unhappy with their appearance, and performing less well at school. Socio-economic status (SES) has been shown to play a role in these stereotypes (Wardle, Volz & Golding, 1995), in that children from higher SES schools assigned fewer positive qualities to fat figures than those children from low SES schools.

The impact of these stereotypes and attitudes towards being overweight on children can be clearly understood in the next study. Richardson, Hastorf, Goodman & Dornbusch (1961) asked 10 and 11-year-olds to rank order six line drawings depicting, a physically normal child, four children with different physical disabilities (in a leg brace or crutches, in a wheelchair, with a hand amputee and with a facial disfigurement), and a child who was clearly overweight. Whilst, as would be expected, the drawing of the child with no disability was preferred, the overweight child was least preferred. Repetitions of the study have found consistency in the rank ordering, and it has been concluded that industrialised Western cultures had the least accepting attitudes to overweight peers and girls were less accepting of overweight same sex peers than boys (DeJong and Kleck, 1986).

The research literature points to evidence of stigmatisation towards obesity including towards pre-adolescent obese children. This outright rejection of being obese by society alongside the strong social message that thinness is to be embraced and preferred, leads to the consequence of "by nine and possibly earlier, children know why they should lose weight and should not be fat" (Hill, 2002).

The pervasiveness of these stereotypes indicates their implicit nature alongside the explicit attitudes often expressed. As Teachman and Brownell (2001) report, explicit attitudes are easily changed, which is also demonstrated by the results of the primary prevention programmes of disordered eating. However, the intrinsic attitudes of individuals are much harder to change and it is these which can identify those individuals who hold the stereotypes of anti-fat very strongly in their beliefs and which have an impact on much of what they do. Therefore, it follows it is important to find means of identifying those who have the more extreme negative implicit attitudes towards being overweight, and investigate their relationship to shape and weight over-concern.

1.8 COGNITIVE BIASES AND IMPLICIT ATTITUDES

1.8.1 Selective processing of shape and weight related information

The assessment of individual's selective processing of shape and weight related information is one way of investigating shape and weight over-concern. This works on the premise that the processing of information can be interfered with when an individual is given shape and weight related information. This would then lead to the hypothesis that those with over-concern of shape and weight are more likely to have greater interference levels in processing shape and weight related information than those who are not over-concerned with shape and weight. However, due to the stigmatisation of being overweight and the social emphasis on the importance of shape and weight there is likely to be a general measurable interference in the processing of shape and weight information compared to neutral information.

One means of measuring the processing of information is the use of the Stroop test. Cooper and Fairburn (1992) adapted the Stroop test and compared adults with eating disorders, dieting individuals and non-dieting controls on a task of colour naming two series of Stroop arrays. These comprised of eating, weight and shape-related words and neutral matched control words. 'Normal dieters' were found to be no different from the non-dieting controls and dieters with a history of features of an eating disorder but no diagnosis together with individuals with a diagnosed eating disorder showed selective processing of information related to eating, weight and shape. However, actual body shape and weight over-concern was not identified or measured, making the association between shape and weight over-concern and selective processing of shape and weight information not clearly evident. The association can only be hypothesised, as it is assumed that those with diet restrictive behaviours have increased shape and weight over-concern.

Green and McKenna (1993) also used the Stroop test and asked children and adolescents to colour name a series of Stroop arrays, comprising of food-related words, body shape-related words, and two sets of neutral matched control words. The sample were male and female children aged nine to 14 years. They found

significant performance decrements for both food- and shape-related words in the 14-year-old girls, a possible colour-naming decrement with food-related words (but not shape) for the 11-year-old girls, and no colour-naming decrements in the nine-year-old group or any age group of the male subjects. They hypothesised that children with eating-related concerns were more likely to show performance decrements on the food- and body shape-related words compared to the neutral matched control words, i.e. showing selective processing of shape and weight information. However, although they compared girls and boys at different ages, again shape and weight over-concern was not measured and so the performance decrements could not be related to an individual's shape and weight over-concern. It can only be hypothesised that the older girls were more likely to have shape and weight over-concerns, than the boys and the younger girls.

Lattimore, Thompson and Halford (2000) repeated Green and McKenna's study (1993) on 12- and 14-year-old females. They also obtained information on dietary restraint and eating psychopathology to determine whether they influenced Stroop performance times. They found significant colour-naming impairments for food-related words in 12- and 14-year-olds. No significant differences were found between restrained and unrestrained eaters in either age group. There were no significant impairments in colour naming body shape-related words in any subgroups. It was concluded that this study did not confirm a different developmental onset for the food and body shape Stroop interference effects in young female adolescents. Furthermore, the findings did not support the use of the eating-related Stroop test as an early objective indicator of potential problems related to eating psychopathology.

Meijboom, Jansen, Kampman and Schouten (1999) specifically looked at automatic, unconscious processing of body shape and weight words compared to strategic, conscious processing through the use of subliminal and supraliminal verbal decision tasks, in restrained eaters with a mean age of 19.7 years. They compared the individuals processing of shape and weight words before and after priming low self-esteem. They found that low self-esteem did not change the processing of the supraliminal shape and weight information, but increased the accessibility of the

subliminally presented shape and weight stimuli. This highlights the importance of assessing unconscious or implicit mechanisms whether it be processing or attitudes.

The use of body shape and weight-related words in a Stroop array is one method of measuring the selective processing of shape and weight information through the comparison of performance decrements between control words and shape and weight-related words. This has the potential of identifying groups of children who are over-concerned with body shape and weight. However, another possible way of exploring shape and weight over-concern is to focus on the implicit nature of shape and weight over-concern and investigate further how implicit attitudes of body shape and weight have been assessed previously.

1.8.2 Implicit attitudes of body shape and weight

Greenwald and Banaji (1995) define implicit attitudes as actions or judgements that are under the control of automatically activated evaluation, without the individual's awareness of that causation. Implicit and explicit attitudes can be similar, but due to the automatic and unconscious nature of implicit attitudes, they can also be unrelated. It follows that there is an increasing interest in implicit attitudes as explicit attitudes are only consciously held evaluations which are manipulated by social desirability and rely on self-report (Teachman and Brownell, 2001). An example of this would be that an individual's racist attitudes can be easily misreported by the person, when it would be highly inappropriate to report them truthfully due to their undesirable nature.

In identifying a way or method of assessing implicit attitudes, Greenwald, McGhee and Schwartz (1998) demonstrated the use of an implicit association test (IAT) in measuring automatic evaluative associations that underlie implicit attitudes. They stated this implicit association method revealed attitudes and other automatic associations of individuals who would have preferred not to express such attitudes. Their study used the IAT to measure differing attributes associated with two target concepts. The two concepts appeared in a two-choice task (e.g. flower vs. insect names) and the evaluation attribute in a second task (e.g. pleasant vs. unpleasant

words). When individuals were required to use the same response for highly associated categories (e.g. flower and pleasant), performance was faster than when they were required to use the same response for less associated categories (e.g. insect and pleasant). Therefore, the performance difference between the two sets of categories measured the difference between the attributes associated with the two concepts. The task was administered on computers achieving highly accurate timed responses.

Greenwald et al's (1998) study found the IAT to be sensitive in picking up near-universal evaluative differences (e.g. flower vs. insect), expected individual differences (Japanese and pleasant vs. Korean and pleasant for Japanese vs. Korean individuals) and most importantly, consciously denied evaluative differences (black and pleasant vs. white and pleasant for self-described unprejudiced white subjects). They concluded that the IAT procedure was sensitive to automatic evaluative associations and in comparing this method to a previous method used to assess similar associations (evaluative semantic priming, e.g. Bargh, Chaiken, Govender & Pratto, 1992), they concluded that the IAT method was twice as sensitive. It was also concluded that the IAT was reliable even if individuals attempted to mask personally or socially undesirable evaluative associations, as well as it being able to assess associations comprising of stereotypes and self-concept.

The IAT method has been developed and applied to investigate stereotypes of obesity in the general population (Teachman, Gapinski & Brownell, 2001, in Teachman and Brownell, 2001) and in obesity treatment specialists (Teachman and Brownell, 2001). For Teachman and Brownell (2001), the understanding of implicit negative attitudes toward obese persons may be critical in identifying why discrimination and stigma continue to be so insidious despite people's good intentions. This stems from evidence of how implicit attitudes predicted prejudiced behaviours more effectively than self-report (e.g. regarding racial prejudice Dovidio, Kawakami, Johnson, Johnson & Howard, 1997). Moreover, people who wish to be unbiased may still be affected by societal messages and may not realise they hold negative attitudes. The two studies used an unrelated practice IAT task in order to familiarise participants with the procedure before completing two 'fat people / thin

people' IAT tasks. The practice task participants were asked to choose whether words belonged to the 'flowers' or 'insects' category, whilst the categories were simultaneously paired with descriptive categories 'good' and 'bad'. When the paired categories matched automatic attitudes (e.g. 'flowers' and 'good') the stimuli were classified faster than when the paired categories were mismatched (e.g. 'insects' and 'good'). In measuring weight attitudes and stereotypes two different IAT tasks were completed. Both had 'fat people' and 'thin people' categories which were paired with 'good' and 'bad' categories or 'motivated' and 'lazy' categories. Participants classified category pairings which both matched and mismatched expected associations, and did so in a time limit. The task was not administered on computers. The variable of interest was the difference in the number of correctly classified items under the two different category pairings (i.e. the matched and mismatched pairings). The greater the difference the greater the implicit attitude or stereotype (negative or otherwise).

Teachman et al (2001) found evidence of implicit anti-fat evaluations of obese individuals as bad people and lazy within the general population, this bias being strong even when individuals did not explicitly report negative attitudes. The same bias was still evident in obesity treatment specialists, but with a reducing buffering factor related to their experience in caring for obese individuals (Teachman & Brownell, 2001).

The IAT method is one way of identifying implicit attitudes of adults that are not masked by self-reported explicit attitudes. Furthermore, it is a method which can identify implicit stereotypes of adults associated with shape and weight in terms of behaviour and core characteristics associated with individuals who are overweight or obese. This method could be adapted for children to assess implicit attitudes of children towards body shape and weight, specifically attitudes towards 'thin people' and 'fat people' associated as being 'good' or 'bad'.

The selective processing of shape and weight related information and the IAT are both possible ways of tapping into and exploring shape and weight over-concern. However, the outcome of studies on selective processing is variable and there are concerns in relation to its reliability and sensitivity as a measure, especially

when used in children. Links between performance decrements and shape and weight concerns have been hypothesised but shape and weight over-concern has not be measured per se and related to performance decrements. However, it has already been tested with children. In examining the IAT, it specifically looks at implicit attitudes (which are automatic and unconscious) towards 'thin people' and 'fat people' and is not masked by explicit socially acceptable attitudes. The implicit attitude is measured by the difference of the number of correctly classified items between the two different category pairings (i.e. the matched and mismatched pairings). This latter method will be able to identify the general trend of attitudes towards 'fat people' in children, as well as identify the group of children who have extreme negative attitudes towards 'fat people'. The measure is more amenable to being administered to large groups due to the possible use of global instructions and due to the task being completed in a set time. The known robustness of the task in not only identifying implicit attitudes but in doing so for overweight stereotypes, also makes it more appealing.

1.8.3 Development of a measure for children assessing implicit attitudes towards body shape and weight

For the current study, Teachman and Brownell's (2001) measure was developed for use with children with some amendments. Similarly, a practice task was needed to ensure the children understood the procedure before attempting the actual task. In order to simplify the task, only 'good' and 'bad' attributes were needed to be paired with the 'thin person' and 'fat person' categories, which means the 'motivated' and lazy' stereotypes could not be assessed. Similarly, the children needed to complete two versions which were expected to reflect the same matched and mismatched negative automatic associations with overweight as for adults (i.e. 'thin person' and 'good' was matched and 'fat person' and 'good' was mismatched). Another adaptation for use with children was an increased length of time for the practice and implicit anti-fat attitude tasks. The adapted measure can be found in Appendix 8.

1.9 SUMMARY OF AIMS OF STUDY AND HYPOTHESES

Shape and weight over-concern and self-evaluation almost exclusively in these terms is a core feature of eating disorder psychopathology and it is this which is thought to drive weight control behaviours. The literature indicates concerns about weight and shape can be present in children at least as young as eight years of age (Hill et al, 1994). However, there is no tool available which measures a child's over-concern with their body shape and weight per se. This study's main aim was to develop an assessment of children's body shape and weight over-concern and to examine its validity in relation to self-perception and implicit attitudes towards overweight. The self-report measure was developed through adapting Harter's Self-Perception for Children questionnaire (1985a), and included two additional scales of body shape and weight worries and shape and weight perceived importance. The items in the new scales were derived from the EDE-Q by drawing out themes from the shape concern and weight concern scales. The rationale behind developing shape and weight worries and importance domains, was that a child with both high levels of shape and weight worries and perceived importance would be identified as having shape and weight over-concern. Once children with body shape and weight over-concern were identified by the revised Harter measure, its validity was examined in relation to children's self-perception. The literature indicates that those children reporting shape and weight over-concern are more likely to be female, heavier, report low self-esteem and are more likely to report dieting behaviours. The assessment measure was then further validated through examining the performance of children on a task measuring their implicit automatic attitudes towards overweight. The task has been adapted from Teachman and Brownell's (2001) study, where implicit negative attitudes and stereotypes towards being overweight were identified. It was anticipated that those children with shape and weight over-concern would have stronger negative implicit attitudes towards overweight (i.e. the greatest discrepancy in the number of correct items between the matched and mismatched pairings) than those without over-concern of shape and weight, but who

would still have negative attitudes.

It was hypothesised that:

Firstly, children reporting body shape and weight over-concern would be more likely to be female, heavier and report low self-esteem and more likely to report dieting behaviours than children without weight and shape over-concern.

Secondly, there would be a general bias against being overweight (anti-fat bias), observed as a whole from the population of children reflecting the current societal stance and stigma attached to overweight. This would be indicated by a negative discrepancy in correct scores between the mismatched and matched IAT tasks.

Thirdly, children identified as having body shape and weight over-concern would have the strongest implicit anti-fat attitudes i.e. they would have the greatest negative discrepancy in scores between the mismatched and matched IAT tasks.

METHODOLOGY

2.1 PARTICIPANTS

A number of schools were approached in an area of North Yorkshire via a letter to the head-teacher (see Appendix 5), which was followed up by a phone call to inquire if the school was interested in taking part in the study. Once a school gave approval for the study, a letter was sent by the school to all parents in Year 5, seeking parental consent (see Appendix 6).

Year 5 children from 10 primary schools took part in the current study. Of the 373 Year 5 registered children, the measures were administered to 345. The remaining 28 were either absent from school at the day of testing (5%) or their parents had refused consent for their child to take part (2%). 12 children (3%) were not included in the sample due to either no height or weight information being obtained or they experienced extreme difficulties during testing and their teacher felt the data would be unreliable. The final sample consisted of 333 children, 181 boys and 152 girls. The mean age of the children was 9 years and 7 months.

2.2 MEASURES

The following measures were used in the current study:

2.2.1 Body shape preferences. Body shape preferences were indicated on a simple pictorial scale used extensively in this age group (Hill et al, 1994). The scale was a series of seven line drawings ordered from extremely thin to obese with letters under each one. Children were presented with the scale and asked: (1) Which figure is most like you now? And, (2) Which figure would you most like to look like? A measure of body shape satisfaction was derived from subtracting the rating of currently perceived body shape from that of the preferred body shape. A difference

of zero indicated satisfaction whereas a negative value corresponded to a desire to be thinner and a positive value corresponded to a desire to be bigger. The girls were given female figures and the boys male figures.

2.2.2 Body shape satisfaction. Body shape satisfaction was measured by asking children to describe how they feel about their height or weight using a seven-point Likert scale for each. The scales ranged from very overweight to very underweight and very much too tall to very much too short. This was taken from Edmunds and Hill's (1999) questionnaire on eating behaviour and dieting.

2.2.3 Dietary restraint. An individual's restrained eating behaviour was measured using the 10 items of the dietary restraint scale from the Dutch Eating Behaviour Questionnaire (Van Strien, Frijters, Bergers and Defares, 1985). The other 23 items from the questionnaire measuring emotional eating and external eating behaviour were not used. The questionnaire has been used previously in children form the age of 9 years (Hill et al, 1994). The responses to the 10 items were on a five-point Likert scale (Never, Seldom, Sometimes, Often, Very Often). The children were also asked to record whether they were currently dieting to lose weight, currently dieting or watching what they ate so as not to put on weight, or not dieting. This latter question was taken from Edmunds and Hill's (1999) questionnaire and adapted to incorporate 'watching what you eat so as to not put on weight' which was shown by Nichter, Ritenbaugh, Nichter, Vuckovic and Aickin (1995) to be distinct from 'dieting' and widely utilised by adolescent females.

2.2.4 Height and weight accuracy. Children were asked to estimate their height and weight. A measure of height and weight accuracy was derived by subtracting the actual height or weight from the estimated height or weight. An accurate estimation obtained a score of zero, an underestimation obtained a negative score and an overestimation achieved a positive score.

These four measures were administered as a single questionnaire (see Appendix 7). For ease of distribution the girls measure was on green paper and the boys on blue paper.

2.2.5 Self-esteem and body shape and weight concern and perceived importance. The Self-Perception Profile for Children is a 48-item questionnaire with six subscales that distinguished global self-worth from competence in five specific domains (Harter, 1985a). These are scholastic competence, social acceptance, athletic competence, physical appearance and behavioural conduct. An additional ten-item scale, presented separately, measures the child's perceived importance of each domain. Both measures of perceived competence and importance were scored using a structured response format designed to reduce the tendency for socially desirable responses. Each questionnaire item presented the child with two contrasting statements, for example, 'Some children *often* forget what they learn BUT Other children can remember things *easily*.' The child had to first choose which was most like her or him, and then rate their choice as either 'sort of true for me' or 'really true for me'. Each item was scored on a scale of 1 to 4, where a score of 1 indicated low perceived competence or importance and a score of 4 reflected high perceived competence or importance.

The two six-item self-report scales devised to assess shape and weight worries and perceived importance, were immersed in the SPPC (Harter, 1985a) and has been described in detail earlier. The shape and weight worries and importance items were scored in the same manner as the rest of the measure. The revised SPPC measure can be found in Appendix 4.

2.2.6 Implicit Attitudes. Children's implicit attitudes towards weight and shape (more specifically 'fat people' and 'thin people') were measured using a version of the Implicit Association Test (IAT) adapted from that used by Teachman and Brownell (2001). In measuring weight attitudes two tasks were completed by the children, both of which had 'fat people' and 'thin people' categories which were either paired with 'good' or 'bad' categories. Children classified category pairings

which both matched and mismatched expected automatic associations (i.e. 'fat people' + 'bad' and 'fat people' + 'good', respectively). This was undertaken within a time limit of 30 seconds. The variable of interest was the difference in the number of correctly classified items under the two different category pairings (i.e. the matched and mismatched pairings). The greater the difference the greater the implicit attitude (negative or otherwise). The order of the matched and mismatched category pairings was counterbalanced within each class of children.

An unrelated practice task was used in order to familiarise the children with the procedure of the task before completing the two 'fat people / thin people' tasks. The children were asked to classify category pairings using 'flowers' and 'insects' categories and 'good' and 'bad' categories. This was undertaken within a 15 second time limit.

In administering the IAT, the task was described as a 'word sorting game'. The children were told they must work down the column of words, indicating which side of the column the word belonged to by ticking one of the two boxes. In addition it was explained they must work as quickly and as accurately as possible, to try to avoid making mistakes but to continue without stopping if this was to occur, and to not miss out any items. They were told to move on to the next column if they finished the first. Emphasis was made on starting only when they were told to and stopping and turning over the page when the investigator said 'stop'. For measure see Appendix 8.

2.2.8 Body height and weight. Body height and weight was collected with standard apparatus, and used to calculate a body mass index (BMI, kg/m^2) for each child. This was undertaken by the principal investigator or by the class teacher on or within one week of the day of testing.

2.3 PILOT STUDY

A pilot study of the revised IAT was conducted to assess the comprehensibility of the words and the instructions for the IAT and hence the

feasibility of using the measure with children. Eight children aged nine to 12 years of age volunteered to take part in the study with their parents' verbal permission. The children completed the measure as described and were asked for comments specifically on how well they understood what they were asked to do, which words they did not understand the meaning of, and any general comments. No amendments were made to the instructions although greater emphasis was placed on not missing out any of the words, and only one word was changed in the 'fat people' category.

2.4 PROCEDURE

All the measures were administered to the children during school time in their class groups with the support of the investigator and their class teacher. All the measures were explained by the investigator who also answered any questions along with the teacher. The session was introduced as 'a study of how you feel about yourself and how you see yourself'. The children were told that the measures did not represent a test and that there were no correct or incorrect answers. Emphasis was placed on working alone, and on answering honestly and accurately. Children were assured that their responses would be private and not disclosed to others and encouraged to ask questions if they did not understand. Prior to each measure uniform instructions were given and the type of response required clearly explained and demonstrated. The measures were administered in the same order. The order was:

1) The Body Shape Preferences / Satisfaction / Dietary Restraint measure,
2) The IAT, and
3) The SPPC measure with immersed Body Shape and Weight Concern and Importance scales.

The measures were completed in one session. Heights and weights were either collected on the same day or within a week of the session.

2.5 DATA ANALYSIS

Following initial scoring of the completed measures, data were analysed using SPSS for Windows.

All participants were initially classified into one of four categories derived from the score they achieved from the body shape and weight concern and perceived importance scales. The same cut-off point as Austin and Joseph (1996) of 2.50 was used to identify participants as having 'high' or 'low' concern or perceived importance so that the participants could be distributed into four groups and classified as having:

1) Low concern and low perceived importance (LowC:LowI)
2) Low concern and high importance (LowC:HighI)
3) High concern and low importance (HighC:LowI)
4) High concern and high importance (HighC:HighI).

The data were analysed using three-way analysis of variance or multivariate analysis of variance with three main factors; gender, shape and weight concern and shape and weight perceived importance.

RESULTS

3.1 BODY SHAPE AND WEIGHT CONCERN AND PERCEIVED IMPORTANCE SCALES

Initial reliability checks were carried out on the body shape and weight concern and perceived importance scales developed from the shape concern and weight concern sub-scales from the EDE-Q (Fairburn and Beglin, 1994). The results from these adapted scales were then used to identify and classify the participants into four groups.

3.1.1 New Scale Reliabilities

Internal reliability was found to be good for the shape and weight concern scale for both girls (Cronbach's alpha = 0.85) and boys (Cronbach's alpha = 0.73). Internal reliability for the shape and weight perceived importance scale was found to be satisfactory for both girls (Cronbach's alpha = 0.67) and boys (Cronbach's alpha = 0.67).

As can be seen from Table 1 deleting any one of the items from the shape and weight concern scale had only a small reducing effect on the internal reliability of the scale for both boys and girls. Only one item (H.15; some children worry about not being thin BUT other children worry more about other things than not being thin) increased the internal reliability of the scale (Cronbach's alpha = 0.76) if it was omitted from the scale, and this just for the boys.

Table 1 also shows that deleting items from the shape and weight perceived importance scale slightly reduced the internal reliability of the scale for both boys and girls. On the whole the reliability was reduced to below 0.65, except for items H.35 (some children think feeling fat is not all that important BUT other children think that to feel good about themselves, it's important not to feel fat) and H.43 (some children think it's important to not look at their body shape in a mirror BUT other children don't think it's important to avoid looking at their own body shape) for the girls and H.43 for the boys. If item H.43 was omitted from the scale the

internal reliability of the scale increased slightly for both girls and boys (Cronbach's alpha = 0.68 and 0.70 respectively).

Table 1. Internal reliability (Cronbach's alpha) of the shape and weight concern and importance scales if each item is deleted. (See Appendix 3 for items in full).

	Girls	Boys
(N)	**(164)**	**(149)**
Shape and Weight Concern Scale Items		
H.3	0.81	0.66
H.7	0.81	0.65
H.11	0.80	0.66
H.15	0.84	0.76
H.19	0.85	0.70
H.23	0.83	0.73
Shape and Weight Perceived Importance Scale Items		
H.27	0.62	0.60
H.31	0.60	0.60
H.35	0.65	0.64
H.39	0.62	0.61
H.43	0.68	0.70
H.47	0.60	0.58

N = number of participants

The two scales were shown to be highly inter-correlated for both the boys ($r=0.524$; $p<.001$) and the girls ($r=0.626$, $p<.001$), indicating that those children who were concerned with shape and weight were more likely to perceive it as important and those who perceived shape and weight as important were more likely to be concerned with it.

There was no significant difference between the mean scores of the boys and girls on the shape and weight concern scale ($t(312) = 1.17$, NS) (see Table 2). Nor was there a significant difference between the boys and girls on the shape and weight perceived importance scale ($t(312) = 0.30$, NS).

Table 2. Mean (SE) scores on the body shape and weight concern and perceived importance scales.

	Girls	Boys
Shape and Weight Concern	2.33 (0.07)	2.23 (0.06)
Shape and Weight Perceived Importance	2.43 (0.05)	2.41 (0.06)

3.1.2 Distribution and Classification

All the children were classified into four categories delineated by the score they achieved from the two scales (the cut-off point being 2.50). They were classified as having:

1. Low concern and low perceived importance (LowC:LowI)
2. Low concern and high importance (LowC:HighI)
3. High concern and low importance (HighC:LowI)
4. High concern and high importance (HighC:HighI).

In total there were 313 children in the four groups. The discrepancy from the original data set of 333 is explained as the groups were derived from the adapted SPPC scale which not all the children in the data set completed.

Figure 2. Number of participants in each of the four concern / importance groups.

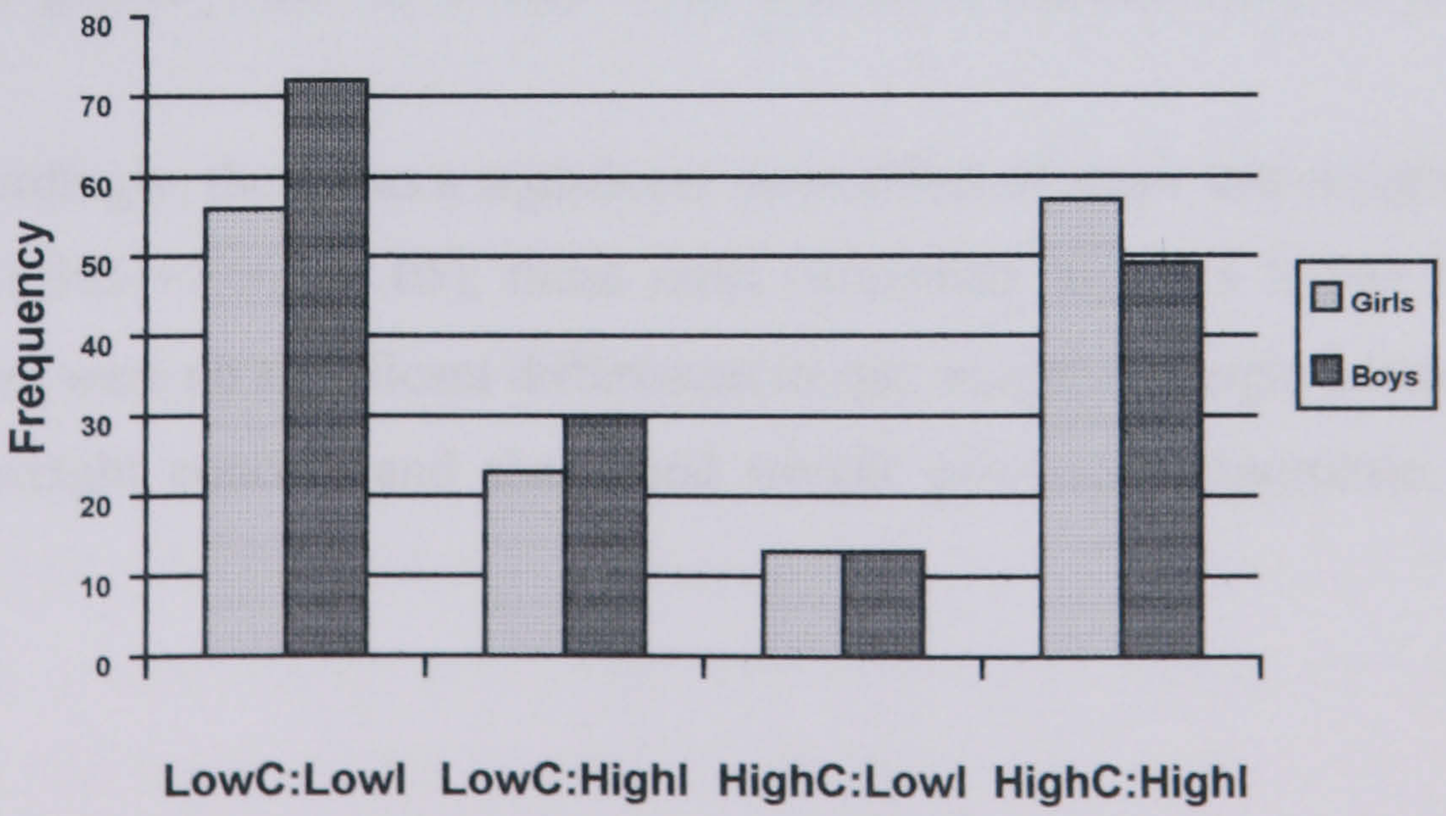


Figure 2 indicates the number of boys and girls classified in each group. As can be seen just under 75% of the children were either in the low concern and low importance group or the high concern and high importance group, with little discrepancy between the number of boys and girls within each group. The biggest group of children (41%) rated themselves as having low shape and weight concern and felt shape and weight to be of low importance, whilst 34% of the children reported high concern and perceived importance (i.e. were over-concerned with shape and weight).

3.2 PARTICIPANT CHARACTERISTICS

Table 3 summarises the physical characteristics of the children. All four groups varied little in their means of age and height for both boys and girls. For the boys the high concern and high importance group had higher means for weight and BMI than the rest of the groups. For the girls the highest weight and BMI means occurred in the high concern, low importance category, although both high concern categories had higher means than the low concern groups. The mean BMI's in each of the four groups for both boys and girls were found to be higher than referenced norms (White, Wilson, Greene et al, 1995). The boys in the high concern groups were 7.2% and 14.1% heavier than the referenced norms for boys compared to 1.9% and 3.1 % heavier in the low concern groups. Similarly, the girls in the high concern groups were also heavier than the norms for girls (8.8% and 5.0%) than the low concern groups (who were only 0.9% and 2.7% heavier than the referenced norms).

Accordingly, there was a significant main effect of shape and weight concern on BMI ($F(1,305)=7.66$, $p<.05$), those most concerned having a higher BMI. In contrast, there were no significant differences in age, height or weight across gender, shape and weight concern and shape and weight perceived importance, nor any interactions.

Table 3. Participants' mean (SE) age, height, weight and BMI.

	LowC : Low I	LowC : High I	HighC : Low I	HighC : High I	
BOYS:					
(N)	**(72)**	**(30)**	**(13)**	**(49)**	
Age (months)	117.0 (0.4)	117.2 (0.7)	115.6 (0.9)	116.6 (0.5)	
Height (cm)	140.1 (0.8)	140.5 (1.6)	138.5 (2.0)	140.7 (0.8)	
Weight (kg)	33.7 (0.8)	34.7 (1.6)	34.7 (2.0)	37.9 (1.0)	
BMI (kg/m^2)	17.1 (0.3)	17.3 (0.5)	17.9 (0.8)	19.1 (0.5)	
GIRLS:					
(N)	**(56)**	**(23)**	**(13)**	**(57)**	
Age (months)	116.5 (0.5)	116.7 (0.6)	118.1 (0.9)	116.1 (0.4)	
Height (cm)	138.6 (1.0)	140.1 (1.6)	138.6 (2.6)	139.6 (0.7)	
Weight (kg)	33.2 (0.9)	34.4 (1.1)	35.8 (2.3)	35.0 (0.9)	
BMI (kg/m^2)	17.2 (0.4)	17.5 (0.5)	18.6 (1.0)	17.9 (0.4)	C*

N = number of participants

C = main effect of shape and weight concern

* $p<.05$

3.3 SELF-PERCEPTION

3.3.1 Self-Report Height and Weight Accuracy

Prior to analysis of the height and weight estimations, the data were examined to check for outliers. Individuals who made estimations below 40 cm or

above 300 cm were excluded from the analysis as were those who estimated their weight at 10 kg or less or 100 kg or more. This resulted in 38 participants' scores being eliminated from the analysis.

Table 4 summarises the children's accuracy of estimating their height and weight (a negative score indicating an underestimation). All the groups for boys and girls underestimated their height and weight, except for the low concern and high importance boys group. There were no larger differences between the boys and the girls and so no significant main effect (or interaction) of gender, shape and weight concern or importance on either the height or weight estimation.

Table 4. Mean (SE) accuracy scores of participants' self-report of height and weight.

	LowC : Low I	LowC : High I	HighC : Low I	HighC : High I
BOYS: (N)	**(70)**	**(26)**	**(11)**	**(46)**
Accuracy of Height Estimation (m)	-2.4 (1.8)	2.9 (3.3)	-11.9 (4.2)	-6.2 (4.4)
Accuracy of Weight Estimation (kg)	-3.0 (0.6)	-2.8 (1.5)	-3.1 (1.6)	-4.0 (1.1)
GIRLS: (N)	**(55)**	**(22)**	**(11)**	**(54)**
Accuracy of Height Estimation (m)	-3.8 (3.9)	-7.9 (5.4)	-6.7 (4.7)	-9.0 (3.8)
Accuracy of Weight Estimation (kg)	-2.6 (0.6)	-4.6 (1.3)	-3.4 (1.9)	-3.9 (0.8)

N = number of participants

3.3.2 Height, Weight and Body Shape Satisfaction and Body Shape Preferences

Table 5 summarises the children's current perceived and preferred body shape and their satisfaction with height, weight and body shape.

Table 5. Mean (SE) ratings of participants satisfaction with height and weight, their perceived current and desired body shapes and body shape preference.

	LowC : Low I	LowC : High I	HighC : Low I	HighC : High I	
BOYS:					
Height Satisfaction	4.06 (0.13)	3.67 (0.14)	3.92 (0.35)	4.00 (0.17)	
Weight Satisfaction	3.88 (0.11)	4.03 (0.19)	4.85 (0.44)	4.33 (0.18)	
Current perceived body shape	3.49 (01.4)	3.40 (0.22)	4.08 (0.40)	3.73 (0.19)	
Preferred body shape	3.72 (0.11)	3.60 (0.21)	3.62 (0.27)	3.41 (0.14)	
Body shape satisfaction	0.27 (0.15)	0.20 (0.26)	-0.46 (0.43)	-0.33 (0.22)	
GIRLS:					
Height Satisfaction	3.88 (0.14)	3.91 (0.27)	3.85 (0.45)	3.93 (0.11)	
Weight Satisfaction	3.94 (0.12)	3.87 (0.10)	4.69 (0.29)	4.16 (0.13)	C*
Current perceived body shape	3.21 (0.12)	3.26 (0.13)	3.38 (0.21)	3.56 (0.13)	G* C*
Preferred body shape	2.98 (0.10)	3.09 (0.15)	2.69 (0.26)	2.93 (0.11)	G**
Body shape satisfaction	-0.23 (0.12)	-0.17 (0.14)	-0.69 (0.31)	-0.63 (0.14)	C*

G = main effect of gender

C = main effect of shape and weight concern

* p<.05: **p<.001

All four groups for both boys and girls had similar height satisfaction mean scores (ranging from 3.67 to 4.06). The scores of the groups for weight satisfaction

were slightly higher in the high concern groups than the low concern groups for the girls and the boys, with the boys and girls again appearing to have similar scores. However, for both height and weight satisfaction all mean scores were around the value of four, which represented 'about the right height or weight'. There was no main effect of gender on either height or weight satisfaction. A main effect of shape and weight concern was observed on weight satisfaction ($F(1,251)=12.25$, $p<.05$) but not height satisfaction. Therefore, those participants who had high shape and weight concern were significantly more dissatisfied with their weight than those with low shape and weight concern. This is consistent with those with high concern having significantly higher BMI scores than those with low concern as shown in Table 3. However, when BMI was included as a covariate, the effect of shape and weight concern on weight satisfaction remained ($F(1,250)=7.11$, $p<.05$). There was no main effect of shape and weight importance on either height or weight satisfaction. Nor was there a significant interaction between gender, shape and weight concern or importance on either height or weight satisfaction.

The girls' groups generally had lower mean scores for both current perceived body shape and preferred body shape than the boys' groups (i.e. chose thinner figures). The high concern groups for both boys and girls had higher scores for current body shape than the low concern groups. All the mean scores were around the value of three or four (out of seven) representing the middle ranging figure or the thinner one below this. There was a main effect of both gender and shape and weight concern on current perceived body shape, where boys rated their current body shape as significantly bigger than the girls ($F(1,304)=4.40$, $p<.05$), as did those children with high shape and weight concern compared to those with low shape and weight concern ($F(1,304)=5.85$, $p<.05$). Gender also had a main effect on the participants' preferred body shape, where girls' preferred shapes were significantly thinner than the preferred body shapes of the boys ($F(1,304)=28.68$, $p<.001$). When BMI was included as a covariate the effect of shape and weight concern on current perceived body shape did not remain, the difference between the high and low shape and weight concern groups becoming non-significant ($F(1,303)=1.31$, NS). However, the effect of gender on current and preferred body shape remained

significant, ($F(1,303)=5.68$, $p<.05$) and ($F(1,303)=28.84$, $p<.001$) respectively. There was no main effect of shape and weight importance on either current or preferred body shape. Nor was there a significant interaction between gender, shape and weight concern or importance on either current or preferred body shape.

All four of the girls' groups achieved a negative score in body shape satisfaction, indicating a desire to be thinner. This was also the case for the high concern groups of the boys, whereas the low concern groups expressed a desire to be broader, achieving a positive score. The groups achieving scores closest to body shape satisfaction (i.e. a rating of zero) were the low concern groups for both boys and girls, in comparison to the scores of the high concern groups which were more negative. There was no main effect of gender or shape and weight importance on body shape satisfaction. However, a main effect of shape and weight concern was found on body shape satisfaction ($F(1,251)=8.95$, $p<.05$). Children reporting high shape and weight concern were significantly more dissatisfied with their body shape than those reporting low shape and weight concern. When BMI was included as a covariate the difference between the groups remained significant ($F(1,250)=3.96$, $p<.05$). No significant interaction was observed.

3.3.3 Dieting and Dietary Restraint

Table 6 summarises participants' reported dietary restraint and the frequency of each group of boys and girls who reported they were not dieting (not dieting), were watching what they ate so as not to put on weight (watching), or were dieting to lose weight (dieting).

The mean dietary restraint scores appeared to increase for each group as the importance and concern groups moved from low to high categories, for the boys. For the girls, the groups that had either high concern or high importance categories had higher dietary restraint scores than the groups with either both low or both high categories. The scores, overall, did not appear to be different between the boys' and the girls' groups and were all around the value of two out of a possible five (with five being the highest). There was no main effect of gender on the children's dietary

restraint scores. However, a highly significant effect of both shape and weight concern ($F(1,304)=48.73$, $p<.001$) and shape and weight perceived importance ($F(1,304)=13.19$, $p<.001$) was observed on the children's dietary restraint. The mean scores indicate that children with high shape and weight concern and perceived importance engaged in restrained eating to a greater extent than those with low shape and weight concern and perceived importance. This is consistent with those with high shape and weight concern having significantly higher BMI scores than those with low concern and being significantly more dissatisfied with their weight and body shape as shown in Tables 3 and 5. However, when BMI was added as a covariate the effect of shape and weight concern and importance remains highly significant ($F(1,303)=42.89$, $p<.001$ and $F(1,303)=12.68$, $p<.001$ respectively). No interaction between gender, shape and weight concern or importance was found on dietary restraint.

Table 6 shows, for the girls, the percentage of children who reported as watching what they ate or as dieting, increased across the four groups as the concern and importance categories changed from low to high. For the boys, the high concern groups had higher percentages of children who were watching or dieting than the low concern groups. The number of boys and girls watching or dieting within the high concern and high importance group (57.1%) differed greatly from the number within the low concern and low importance group (20.0%), a difference in proportions that was highly significant ($z = 5.81$, $p<.001$).

Table 6. Mean (SE) scores of participants' dietary restraint and percentage of each group in categories of self-reported dieting.

	LowC : Low I	LowC : High I	HighC : Low I	HighC : High I	
BOYS:					
Dietary Restraint Score	1.90 (0.08)	1.97 (0.10)	2.31 (0.14)	2.85 (0.10)	
Not Dieting (%)	84.1	90.0	69.2	51.0	
Watching (%)	11.6	6.7	23.1	26.5	
Dieting (%)	4.3	3.3	7.7	22.5	
Watching or Dieting (%)	15.9	10.0	30.8	49.0	
GIRLS:					
Dietary Restraint Score	1.75 (0.10)	2.07 (0.13)	2.37 (0.20)	1.79 (0.10)	C** I**
Not Dieting (%)	75.0	65.2	53.8	35.7	
Watching (%)	19.6	26.1	23.1	50.0	
Dieting (%)	5.4	8.7	23.1	14.3	
Watching or Dieting (%)	25.0	34.8	46.2	64.3	

C = main effect of shape and weight concern

I = main effect of shape and weight importance

**p<.001

3.3.4 Self-Esteem

Table 7 summarises the means for each of the domains of perceived self-competence for boys and girls. All the means for both boys and girls, for all four groups and for all the domains (including global self-worth) were around the values of two or three (out of a range of one to four, with four being the highest rating of competency). Competency ratings generally decreased for both boys and girls as concern and importance increased. Girls and boys means did not appear to differ in the domains except for athletic competence (where boys means were generally higher than girls means) and behavioural conduct (where the reverse was true).

Gender and shape and weight concern had a highly significant impact overall on perceived self-competence ($F(6,296)=5.41$, $p<0.001$ and $F(6,296)=11.01$, $p<.001$ respectively). Univariate analysis identified main effects of gender on measures of athletic competence ($F(1,301)=7.47$, $p<.05$) and behavioural conduct ($F(1,301)=18.96$, $p<.001$), both of which which remained when BMI was included as a covariate ($F(1,300)=7.52$, $p<.05$ and $F(1,300)=19.18$, $p<.001$ respectively). As can be seen from the means in Table 7 the girls had lower perceived athletic competence but higher perceived self-competence in behavioural conduct than the boys.

Main effects of body shape and weight concern were found in each domain of perceived self-competence, with the exception of behavioural conduct. For the children with high shape and weight concern, their perceived self-competence was significantly lower in the areas of scholastic competence ($F(1,301)=3.92$, $p<.05$), social acceptance ($F(1,301)=8.66$, $p<.05$), athletic competence ($F(1,301)=18.87$, $p<.001$) and physical appearance ($F(1,301)=62.27$, $p<.001$). The effects remained when BMI was included as a covariate ($F(1,300)=4.87$, $p<.05$; $F(1,300)=8.46$, $p<.05$; $F(1,300)=17.44$, $p<.001$; and $F(1,300)=59.43$, $p<.001$ respectively).

For the measure of global self-worth there was no main effect of gender. However, participants with high shape and weight concern had highly significantly lower self-worth than their peers with low shape and weight concern ($F(1,301)=38.67$, $p<.001$). Again, this was still observed when BMI was included as a covariate ($F(1,300)=37.87$, $p<.001$).

Table 7. Means (SE) of participants' ratings of perceived self-competence of five specific domains and global self-worth.

	LowC : Low I	LowC : High I	HighC : Low I	HighC : High I	
BOYS:					
Scholastic Competence	2.77 (0.07)	2.54 (0.12)	2.73 (0.18)	2.34 (0.11)	
Social Acceptance	3.01 (0.09)	2.98 (0.14)	2.73 (0.20)	2.52 (0.13)	
Athletic Competence	3.21 (0.08)	3.12 (0.14)	2.63 (0.19)	2.79 (0.12)	
Physical Appearance	3.03 (0.19)	3.02 (0.13)	2.54 (0.15)	2.28 (0.12)	
Behavioural Conduct	2.84 (0.08)	2.73 (0.12)	2.81 (0.18)	2.54 (0.09)	
Global Self-Worth	3.19 (0.08)	3.18 (0.03)	2.99 (0.18)	2.53 (012)	
GIRLS:					
Scholastic Competence	2.98 (0.10)	2.75 (0.11)	2.62 (0.24)	2.62 (0.10)	C*
Social Acceptance	3.01 (0.10)	2.93 (0.15)	2.78 (0.22)	2.62 (0.09)	C*
Athletic Competence	2.92 (0.09)	2.81 (0.15)	2.29 (0.14)	2.57 (0.11)	G* C**
Physical Appearance	3.29 (0.08)	3.22 (0.10)	2.47 (0.16)	2.21 (0.10)	C**
Behavioural Conduct	3.25 (0.09)	3.07 (0.10)	2.99 (0.19)	3.13 (0.08)	G**
Global Self-Worth	3.47 (0.08)	3.27 (0.07)	2.68 (0.16)	2.54 (0.10)	C**

G = main effect of gender

C = main effect of shape and weight concern

*p<.05; **p<.001

No main effects of shape and weight importance, nor interactions between gender, shape and weight concern or importance were observed on perceived self-competence.

Table 8 summarises the mean importance ratings for each of the five domains of perceived competence. Overall, the means for boys and girls, all four groups and all five domains had values between two and three (out of a range of one to four with four being the highest rating of importance). The girls and the boys did not differ greatly. Whilst gender and shape and weight concern did not have a significant impact overall on perceived domain importance, shape and weight importance did ($F(5,297)=8.83$, $p<0.001$). Table 8 shows that main effects of shape and weight perceived importance were found on measures of perceived importance of scholastic competence ($F(1,301)=12.00$, $p<.05$), athletic competence ($F(1,301)=11.17$, $p<.05$) and physical appearance ($F(1,301)=31.41$, $p<.001$). All three remained significant when BMI was included as a covariate ($F(1,300)=12.20$, $p<.05$; $F(1,300)=11.87$, $p<.05$; and $F(1,300)=31.87$, $p<.001$ respectively).

The percentage agreement as to the importance of each self-esteem domain was calculated by classifying participants' scores as either important (a rating ≥ 3.0) or not important (a rating <3.0). This showed that 67.1% of the children in both the high shape and weight importance groups (LowC : HighI and HighC : HighI) rated scholastic competence as being important, whilst only 55.6% of the participants in both of the low importance groups (LowC : LowI and HighC : LowI) rated it as important. Similarly, athletic competence was rated as important by more participants in the high importance groups (52.2%) compared to the participants in the low importance groups (42.5%). The difference between the two groups was more marked in ratings of the importance of physical appearance, with more participants in the high shape and weight importance groups rating the domain as important (45.6%) compared to the low importance groups (19.6%).

Table 8. Means (SE) of participants' ratings of the importance of each of the five specific domains of competence.

	LowC : Low I	LowC : High I	HighC : Low I	HighC : High I	
BOYS:					
Scholastic Competence	2.98 (0.09)	3.05 (0.13)	2.65 (0.21)	3.14 (0.10)	
Social Acceptance	2.59 (0.09)	2.75 (0.15)	2.38 (0.23)	2.54 (0.12)	
Athletic Competence	2.80 (0.11)	2.98 (0.15)	2.27 (0.25)	2.86 (0.13)	
Physical Appearance	2.23 (0.08)	2.53 (0.15)	2.08 (0.23)	2.90 (0.12)	
Behavioural Conduct	3.01 (0.07)	2.98 (0.18)	2.85 (0.24)	3.10 (0.13)	
GIRLS:					
Scholastic Competence	2.85 (0.11)	3.13 (0.11)	2.58 (0.20)	3.14 (0.09)	I*
Social Acceptance	2.46 (0.09)	2.35 (0.15)	2.50 (0.20)	2.61 (0.10)	
Athletic Competence	2.32 (0.11)	2.57 (0.11)	2.19 (0.22)	2.71 (0.11)	I*
Physical Appearance	2.08 (0.09)	2.67 (0.12)	2.31 (0.17)	2.80 (0.10)	I**
Behavioural Conduct	3.30 (0.09)	3.13 (0.16)	2.73 (0.18)	3.32 (0.08)	

I = main effect of shape and weight importance

* $p<.05$: ** $p<.001$

3.4 IMPLICIT ATTITUDES

Prior to analysis and distribution, the IAT data were examined to ensure all the participants had fulfilled three basic criteria. These were in place in order to check for outliers and to ensure the data used for analysis was from participants who

understood the instructions, showed good attention and were not distracted. The three criteria derived from those by Teachman and Brownell (2001) were as follows:

I. Participants must have completed four or more items on either of the two experimental tasks. Unusually slow responding to the task was likely to indicate inattention or lack of understanding. Twenty sets of data (6.0%) were excluded from the analysis.

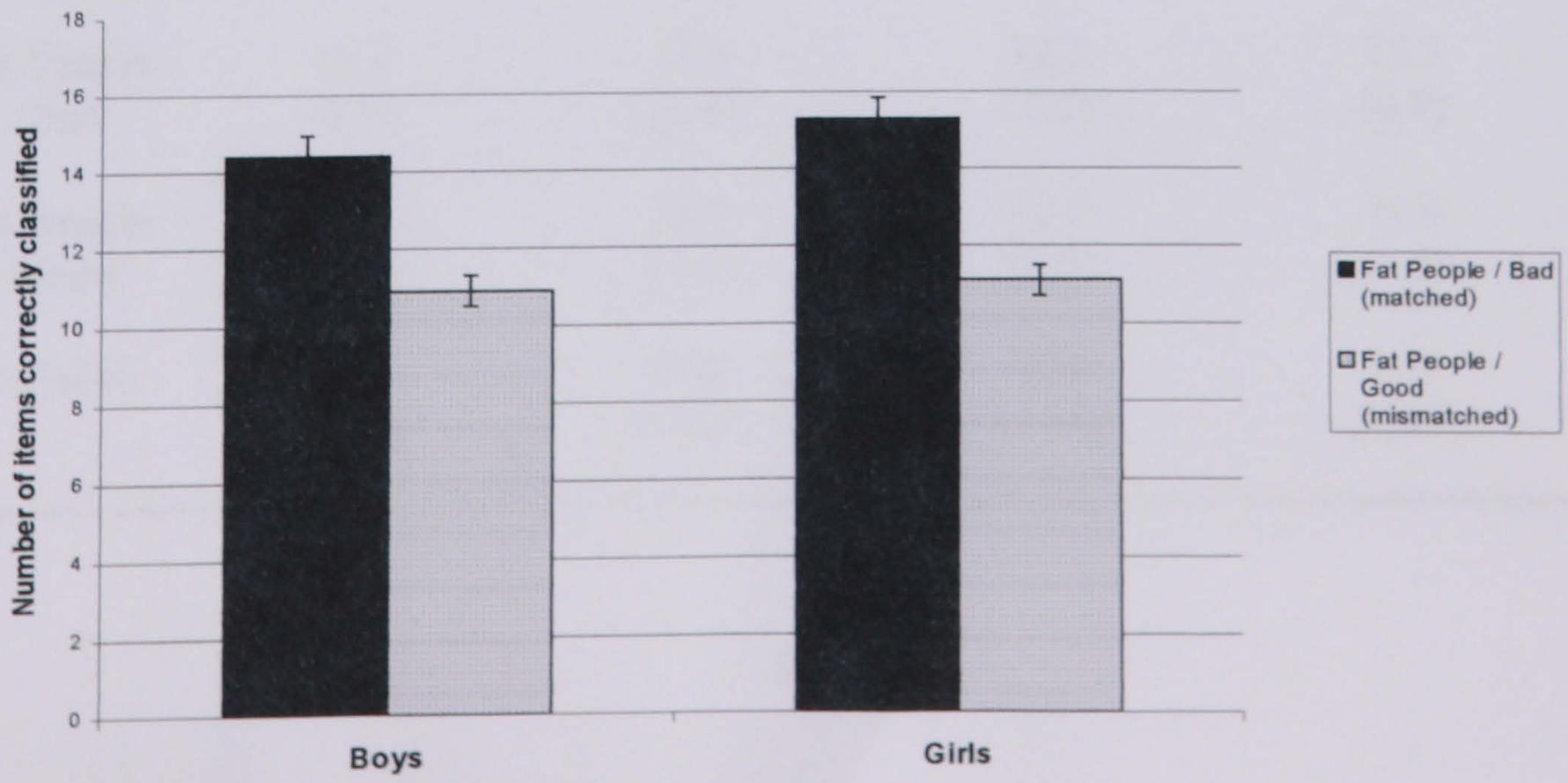
II. Either of the two tasks must not have had high error rates (i.e. ≥ 35% incorrectly classified items). High error rates indicated unreliability, possible distraction or lack of understanding. This resulted in 66 sets of data (19.8%) being excluded.

III. Participants must not have missed out five or more items (between the first and last completed items) on either task. This was also thought to reflect inattention or lack of understanding. Twenty four sets of data (7.2%) were excluded from further analysis due to this criteria.

The remaining seven sets of data not included in the analysis (2.1%) were from children who had been identified as not starting or stopping at the correct points or were not able to be classified in the shape and weight concern and importance groups.

A total of 117 sets of data (35.1%) were excluded from the analysis. This resulted in 216 sets of IAT scores being used for further analysis: 56.9% of the boys data remained compared to 74.3% of the girls data.

Figure 3. Number of items correctly classified for each condition of the IAT for boys and girls.



An implicit attitude (IA) score for each participant was obtained by subtracting the number of items correctly classified in the mismatched category pairing condition (fat people + good) from the matched condition (fat people + bad). A positive score indicates an anti-fat bias and a negative score indicates a pro-fat bias. As can be seen in Figure 3 and Table 9, each group had a positive IA score. The boys' and girls' IA scores and number correct for each condition did not differ, nor did there appear to be any pattern between the four groups except for the matched condition having higher scores than the mismatched condition. There was a highly significant difference between the matched and mismatched category pairing conditions for the boys ($t(107)=8.63$, $p<.001$) and the girls ($t(112)=9.38$, $p<.001$), indicating all groups classified more items correctly in the 'fat people + bad' condition than the 'fat people + good' condition.

Table 9. Means (SE) of participants' IA scores and number correct for each IAT condition.

	LowC : Low I	**LowC : High I**	**HighC : Low I**	**HighC : High I**
BOYS:				
(N)	**(47)**	**(22)**	**(7)**	**(27)**
Fat People / Bad	14.6 (0.9)	13.8 (1.2)	17.1 (1.8)	14.9 (1.2)
Fat People / Good	10.8 (0.6)	11.1 (1.0)	13.0 (1.7)	10.7 (0.8)
IA Score	3.77 (0.61)	2.64 (0.75)	4.14 (1.26)	4.19 (1.00)
GIRLS:				
(N)	**(51)**	**(15)**	**(9)**	**(38)**
Fat People / Bad	16.1 (0.9)	13.5 (1.4)	14.2 (1.2)	15.3 (0.9)
Fat People / Good	11.2 (0.6)	10.3 (1.2)	12.0 (1.9)	11.0 (0.6)
IA Score	4.86 (0.72)	3.20 (0.64)	2.22 (1.35)	4.37 (0.85)

Multivariate analysis indicated no main effect was observed of gender (F(1,207)=0.71, NS), shape and weight concern (F(1,207)=0.60, NS) or shape and weight importance (F(1,207)=0.91, NS) on the IA score, the number of correct scores of the 'fat people + bad' condition, or the 'fat people + good' condition. Nor was there any interaction.

3.5 PREDICTORS OF BODY SHAPE AND WEIGHT OVER-CONCERN.

A standard multiple regression analysis was performed between body shape and weight over-concern (shape and weight concern was combined with perceived importance) and the key variables where main effects of shape and weight concern and / or importance were found. These were; BMI, body shape satisfaction, dietary restraint score, physical appearance and global self-worth.

The regression equation for body shape and weight over-concern was statistically highly significant for both the boys and the girls (F(5,156)=20.93, $p<.001$ and F(5,140)=41.94, $p<.001$ respectively). The five variable model explained 38% of the adjusted variance (R^2) in shape and weight over-concern for the boys and 59% for the girls.

Table 10. Predictors of body shape and weight over-concern in boys.

Variables	B	Beta	T	Sig	sr^2 (unique)
BMI	0.031	0.078	0.939	0.349	0.006
Body Shape Satisfaction	-0.089	-0.107	-1.336	0.184	0.011
Dietary Restraint Score	0.481	0.318	4.471	0.000	0.114
Physical Appearance	-0.184	-0.128	-1.235	0.219	0.010
Global Self-Worth	-0.396	-0.263	-2.587	0.011	0.041

Table 11. Predictors of body shape and weight over-concern in girls.

Variables	B	Beta	T	Sig	sr^2 (unique)
BMI	0.011	0.026	0.445	0.657	0.001
Body Shape Satisfaction	0.037	0.028	0.464	0.643	0.002
Dietary Restraint Score	0.600	0.394	6.645	0.000	0.240
Physical Appearance	-0.689	-0.437	-4.816	0.000	0.142
Global Self-Worth	-0.198	-0.115	-1.265	0.208	0.011

B = the unstandardised regression coefficients

Beta = the standardised regression coefficients

sr^2 = semipartial correlations

Table 10 shows that only two of the variables, dietary restraint and global self-worth, contributed significantly to the prediction of shape and weight over-concern in the boys. The unique contribution of each towards the adjusted variance (R^2) in shape and weight over-concern was 11% for dietary restraint score and 4% for global self-worth. Whist two of the variables were also highly significant predictors of shape and weight over-concern in the girls, these were dietary restraint and physical appearance (see Table 11). The unique contribution of dietary restraint score to the adjusted variance in shape and weight over-concern was 24% and 14% for physical appearance.

3.6 SUMMARY OF RESULTS

1. The body shape and weight concern and perceived importance scales were found to have good and satisfactory internal reliability for both boys and girls. There was no difference between the boys and girls on their scores for either scale.
2. Those children with high shape and weight concern had significantly higher BMIs than those with low concern.
3. Children with high shape and weight concern were found to be less satisfied with their weight, and body shape and rated their current perceived body shape as bigger than their low concerned peers.
4. Children with high shape and weight concern, compared to those with low concern, and high perceived importance of shape and weight, in comparison to those with low importance, were found to have reported increased levels of dietary restraint.
5. Those children who reported high shape and weight concern were found to report themselves as being less competent scholastically and athletically when compared to their peers who were less concerned about shape and weight. They also perceived themselves to be less socially accepted, to have poorer physical appearance and lower global self-worth than the low concerned children.
6. There was a universal negative bias amongst the children in their implicit attitudes towards 'fat people', i.e. that they were 'bad' whereas 'thin people' were 'good'. However, no differences in these attitudes were found between the girls and boys, the concerned and unconcerned groups and the high and low importance groups.
7. Five variables (BMI, body shape satisfaction, dietary restraint score, physical appearance and global self-worth) explain 38% of the adjusted variance in shape and weight over-concern for the boys and 59% for the girls. Dietary restraint score significantly contributed to the prediction of shape and weight over-concern for both boys and girls, global self-worth and physical appearance were also significant contributors for boys and girls respectively.

DISCUSSION

The structure of the first part of the discussion will be provided by the aims and hypotheses set out in the introduction. This will be followed by a discussion of the clinical implications and methodological issues raised by the current study and suggestions for future research.

4.1 PROPERTIES OF THE SHAPE AND WEIGHT OVER-CONCERN ASSESSMENT FOR CHILDREN.

4.1.1 Reliability

A reliable measure is one that is affected only minimally by fluctuations in anything other than the characteristic being measured (Leavitt, 1991). There are two main ways of assessing the reliability of a measure, looking at its test-retest properties and the internal consistency of the items used.

The internal consistency of the two scales was examined separately for the boys and the girls. Although both scales were found to be adequately reliable the shape and weight concerns scale had greater internal consistency. For the girls all the items contributed to the reliability of the shape and weight concerns scale (which was good, Cronbach's alpha = 0.85) with none of items increasing the internal consistency if they were deleted from the scale. However, one item did slightly increase the reliability of the concern scale for the boys when it was removed, this being 'some children worry about not being thin BUT other children worry more about other things than not being thin'. This is not entirely unexpected as nine-year-old boys have been found to identify their ideal body shape at a broader point than their current shape where as girls were found to place their preferred shape at a thinner point that their current shape (Hill et al, 1994). There could be an argument for adapting this item for boys only. However the items were derived from the EDE-Q measure which did not use the notion of 'being broader', hence it was not included in the original scale.

One item when deleted from the shape and weight perceived importance scale slightly increased the internal reliability of the measure for both the girls and the boys. This item, 'some children think it's important to not look at their body shape and weight in the mirror BUT other children don't think it's important to avoid looking at their own body shape', probably holds more meaning for young children when used in the concern scale. However, the concept of importance in respect of this theme may be too abstract for Year 5 children, with increased ambiguity decreasing reliability. For increased internal consistency for the perceived importance scale it may be useful to adapt or change this item.

The internal consistency data from the six pre-existing subscales from the SPPC (Harter, 1985a) is very similar to the internal consistency of the two new scales (with Chronbach's alpha ranging from 0.71 to 0.86).

Unfortunately the test-retest properties of the two scales were not investigated, as at the time of data collection this was not prioritised due to the increased demands this would have placed on the schools and individual children who would have been involved. One possible means of doing this could have been to return to one of the classes a week later to administer the measure to the same children again, ensuring the exact instructions and support was used. The two sets of scores for each child could then have been correlated to evaluate the two scales' stability over time. The test-retest reliability of the six pre-existing subscales of the SPPC over a three-year period was found to be variable (Granleese and Joseph, 1994). Scores on the global self-worth subscale at eight years of age were highly correlated with scores at 11 years of age and did not change over time. This was said to suggest perceptions of global self-worth remain highly stable. However, the other subscales measuring competence of specific domains, did not show the same level of stability.

In summary, the evidence obtained on the reliability of the shape and weight concern and perceived importance scales would suggest the current measures have good internal reliability. However, a test-retest appraisal would enhance the conclusions made about the two scales overall reliability.

4.1.2 Validity

A valid measure is one that measures what it sets out to measure and there are three processes in assessing the validity of measures. These are; concurrent validity (the accuracy of a measure in classifying), predictive validity (the accuracy of the measure in predicting what participants will do or how they will be classified) and construct validity (the extent to which the measure behaves according to expectations). The first two are combined (criterion-related validity) as for both, results are correlated with some criterion (Leavitt, 1991).

Criterion-related validity was not investigated in the current study. However, construct validity was examined in relation to the children's self-perceptions. This was elicited from the first hypothesis, that children reporting body shape and weight over-concern would be more likely to be female, heavier, report low self-esteem and be more likely to report dieting behaviours than children without shape and weight over-concern.

The expected difference between girls and boys on the shape and weight concern and perceived importance scales was not found. Although past literature has found young girls to have more general shape and weight concerns than boys (Collins, 1991) there is evidence that older girls have increased concerns in comparison to younger girls (Maloney et al, 1989). Furthermore, the lack of differentiation between the sexes is not without precedence. Some studies of children as young as eight-years have found little or no gender differences in reporting shape and weight concerns (Maloney et al, 1989) and it may be that the divergence between girls and boys occurs after 11 years of age as they head into adolescence. Certainly, Wardle, Marsland, Sheikh, Quinn, Federoff and Ogden (1992) found gender differences to increase with age in their sample of 11 to 17 year old children and adolescents.

Overweight children have been shown to report increased shape and weight dissatisfaction (Wadden et al, 1989, and Hill et al, 1994). Therefore for the current assessment of over-concern to be valid it would be expected that children reporting high shape and weight concern compared to low concern, and reporting high perceived importance in comparison to low importance would have significantly

higher BMI's. This was found in the current study for the shape and weight concern scale only, reinforcing the literature. However, BMI did not have an effect on shape and weight perceived importance. The potential explanations for this could be as follows. Firstly, perceived importance of shape and weight is not a part of the conceptualisation of over-concern as predicted. Secondly, the importance scale either did not actually assess shape and weight importance (is not a valid measure) or was not sensitive enough in doing so. Or thirdly, importance does not play a role in over-concern until children are older.

Doll and Fairburn (1998) found heightened accuracy of self-reported weight in adults with eating disorders and concluded this accuracy was an expression of their intense interest in their weight. Therefore, it was hypothesised that those children with shape and weight over-concern would also have heightened accuracy of self-reported weight. It was expected that the high concern and high importance groups of children would be more accurate in estimating their height and weight. No differences were found between any of groups. This could be due to a number of reasons other than the poor validity of the assessment measure. The past evidence comes from an adult sample who had eating disorder psychopathology, and so the measure or theory may not generalise well to children from the general population. The task may have been too difficult for young children negating the sensitivity of the tool (i.e. did the children have the ability to estimate? Were they too young?), which would have been exacerbated by the confusion of the children in understanding the metric and imperial systems. Interestingly, nearly all groups underestimated their weight and height.

It was expected that those children with high shape and weight concern and high perceived importance would have lower self-esteem generally (Hill and Pallin, 1998) and more specifically physical appearance (Hill et al, 1992) which has been shown to be highly correlated with global self-worth (Harter, 1993). Children with high shape and weight concern were found to have lower self-esteem in comparison to their low concerned peers. Specifically this was in the areas of scholastic and athletic competence, social acceptance, physical appearance and global self-worth. The highly significant effect of shape and weight concern on ratings of competence

in physical appearance was very much expected, and provides additional evidence for the high validity of the shape and weight concern scale. Children with high shape and weight perceived importance were no different in their self-esteem when compared to their peers who perceived shape and weight to be of low importance. This could be as a result of the scale lacking the sensitivity required to identify such differences, or due to perceived importance of shape and weight not being part of the conceptualisation of over-concern as predicted.

The research literature highlights findings of children who report body shape and weight concerns also report high dietary restraint (e.g. Hill et al, 1992). Therefore, it was expected that the children in the current study with high shape and weight concern and high perceived importance would report increased dieting behaviours in comparison to their low concerned and low importance peers. This was found, with perceived importance in children having a large additive effect to the effect of concern on the dietary restraint score. Hence, the more concerned the children were about shape and weight and the more important they felt it to be the more likely they were to engage in dietary behaviours. Accordingly those children with high shape and weight concern and importance had significantly much higher dietary restraint scores than those with low concern and importance.

It should also follow that high shape and weight concerned children would have increased body shape dissatisfaction. This was found, in that high shape and weight concerned children also rated their current perceived body shape as bigger. Not surprisingly this latter effect could be accounted for by increased BMI. As Hill et al (1994) found, and as would be expected, boys rated their current and preferred body shapes as bigger than the girls. Again, there was no effect of shape and weight perceived importance on body shape dissatisfaction or current of perceived body shape. Possible explanations follow on from previous ones outlined where shape and weight importance has not had an expected effect on other variables.

The shape and weight concern and perceived importance scales were found to correlate highly with each other (0.524 for the boys and 0.626 for the girls) hence those who were concerned with shape and weight tended to think it was important and vice versa. This provides some evidence for the proposed conceptualisation of

shape and weight over-concern (i.e. concern and importance). It also indicates a degree of validity for the two scales. However, with the scales being correlated as they were, there would have been an expectation for shape and weight importance to have had a greater effect on a number of the variables, especially on those which had main effects of shape and weight concern.

Further evidence for the validity of the importance scale can be found when examining the perceived importance of the self-esteem domains. High shape and weight importance children would be expected to report high perceived importance of other domains (especially physical appearance). This was found, specifically in scholastic and athletic competence and highly significantly in physical appearance.

Therefore, in examining why shape and weight importance did not have a significant effect on more variables it appears it is not likely to be a result of diminished validity of the importance scale. The likely possibilities which remain are, the lack of sensitivity of the measure, shape and weight importance not being part of the over-concern conceptualisation, or shape and weight importance not being important in children until they are older.

In summary, in exploring shape and weight concern in children, those children with high shape and weight concern were heavier, had lower self-esteem and reported increased dietary behaviours. However, they were not more likely to be female. One likely explanation of this is that the differentiation between the sexes found in body shape and weight concern is more likely to occur later than the age of the current study's sample group, as children move towards adolescence. Therefore, it can be concluded that the construct validity of the shape and weight concern scale is adequate or better than adequate. When evaluating shape and weight perceived importance children with high perceived importance only reported increased dietary restraint in comparison to their peers who perceived shape and weight to be of low importance. In exploring why there was no effect of perceived importance on other variables as expected (i.e. more likely to be female, heavier and report low self-esteem) it seems unlikely it is as a result of the poor validity of the scale. This is because both the new scales correlated well with each other and the high shape and weight importance children also reported physical appearance and

other competencies as being important. Further analysis of the validity of the scale by examining its criterion-related validity would be pertinent in taking this further, as it would for the concern scale. The likely explanation for the findings of the shape and weight importance in children, is one of a lack of understanding as to what the role of shape and weight importance is within the conceptualisation of shape and weight over-concern. Overall, the information gathered in the current study suggests the new scales have adequate properties for use with primary school children.

4.2 Dietary Behaviour

Dietary behaviour has been used in the past as an indicator of eating disorder psychopathology as well as a means of assessing effectiveness of prevention programmes. In the current study shape and weight perceived importance and shape and weight concern have both been shown to be significantly linked with dieting. Indeed dietary restraint was the only variable where both importance and concern was shown to have an effect, with importance having an additive effect to that of concern on the restraint score. This reflects Fairburn's cognitive view of the maintenance of eating disorders (1997) where body shape and weight over-concern is a core feature leading to other features found in these disorders, such as dieting. The correlation between shape and weight over-concern and dieting found in this study does not indicate causation. So it is unclear as to whether individuals who are concerned about shape and weight and think it is important are more likely to diet, or those who diet are then more likely to become increasingly concerned about shape and weight and increasingly think it is important. Although the former is most likely, this study does not provide the necessary directional evidence.

With shape and weight over-concern being operationalised as shape and weight concern and shape and weight perceived importance, five variables were found to explain 38% of the adjusted variance in over-concern for the boys and 59% of the variance for the girls. The five variables were BMI, body shape satisfaction, dietary restraint score, physical appearance and global self-worth. All of these have

been shown to be associated with shape and weight concerns in children, and were shown to be effected by shape and weight concern in the current study, and for some shape and weight perceived importance. With a significant amount of the variance being explained by these factors, then it would suggest that the proposed conceptualisation of shape and weight over-concern is a reasonable one, certainly for primary-school children and more significantly for the girls.

Global self-worth was found to be a significant contributor to the prediction of shape and weight over-concern for the boys, whilst for the girls it was replaced with physical appearance. However, it has been shown many times that global self-worth is highly inter-correlated with physical appearance in children, adolescents and adults (Harter, 1993, and Granleese and Joseph, 1994). Therefore, as predictors, physical appearance and global self-worth are very similar constructs indicating there are similarities in predictors of shape and weight over-concern for the boys and the girls.

It is of note that dietary restraint on its own explains 11% of the variance of shape and weight over-concern in the boys and 24% in the girls. The finding of a strong link between over-concern and dietary restraint, alongside both shape and weight concern and perceived importance having an impact on the dietary restraint score of the children, suggests that dietary restraint is the most important variable in terms of its relationship with shape and weight over-concern. As this concurs with Fairburn's theory (1997), it can be concluded that over-concern has been reasonably operationalised in the current study and the properties of the assessment measure are of a reasonable standard. In summary, the current study has developed a good assessment of body shape and weight over-concern in children.

4.3 Implicit Attitudes

The second hypothesis stated there would be a general bias against being overweight (anti-fat bias), observed as a whole from the population of children being studied. This was indeed found. Both the girls and boys were found to attain a score which indicated an anti-fat bias, indicating the Implicit Attitude Test measured

the current societal stance and stigma attached to being overweight. This in turn suggests the measure was reasonable and that having been originally developed for adults, it can be adapted for use with younger children. The negative attitude towards being overweight in the general population was found by Teachman, Gapinski and Brownell (2001) in adults and to a lesser extent in health-care professionals working with obese individuals (Teachman and Brownell, 2001). This study shows that such implicit attitudes are very evident in children as young as nine years of age, regardless of their gender and their concern or perceived importance of body shape and weight.

However, the third hypothesis that the children who were over-concerned with shape and weight would be more likely to have the strongest implicit anti-fat attitudes, was not supported. The results did not show any differences between the four groups or between the girls and the boys. There are several possible explanations for this. Firstly, the differences between children who are shape and weight over-concerned may not exist. Secondly, the adapted measure used may not have been sensitive enough in assessing the more subtle differences that may exist between children who are concerned about shape and weight and / or think it is important. In its current adaptation it may only be successful in assessing strong, universal attitudes. A lack of sensitivity may be as a result of not using a computer to administer the task, as Greenwald et al (1998) used in the original version of the Implicit Attitude Test. However, Teachman and Brownell (2001) did not use a computer and they were still able to assess more subtle differences between the obesity specialists and the general population, but this was in adults. Therefore, the measure, being administered as it was, may not have been sensitive enough in assessing subtle differences in children per se. This can only be further investigated by making additional adaptations to the measure and the assessment of weight attitudes being replicated. This is most likely to require a return to the original procedure of Greenwald et al (1998) of administering the task with a computer. Another explanation for the measure failing to achieve the expected outcome could lie in the Implicit Attitude Test being too difficult for the children to understand

what was expected of them. This is suggested by the numbers of participants excluded from the final analysis (35%).

In short, a general anti-fat bias was found amongst Year 5 children as a whole, highlighting our society's stance and stigma attached to being overweight impacting on children even as young as nine years of age. No differences were found between children who were concerned about body shape and weight or thought it to be important, but this does not necessarily reflect such differences do not exist. The measure is likely to need further adaptation to subsequently explore this issue, as there were a number limitations of the measure in its use with children.

4.4 Clinical Implications

The means of assessing shape and weight over-concern in all aged individuals is important as it can provide a reliable and valid marker of eating disorder psychopathology. More specifically in younger children it can help clinicians and other professionals who work with children identify those individuals who are more likely to develop difficulties around body shape and weight and eating. The shape and weight scales developed in the current study have been shown to be reasonable measures of shape and weight concern and perceived importance, which in turn has been shown to be an adequate means of assessing shape and weight over-concern. They have also been evaluated as being suitable to be used in younger children (specifically Year 5) as a class based exercise, implicating their use for routine, screening purposes. However, the measure could be equally useful in a clinical, individual setting.

An increase in understanding of the role of shape and weight over-concern in the development of eating disorders and how over-concern can be broken down into more observable traits, can inform the prevention of eating disordered psychopathology as well interventions. Generating scales that assess core features of eating disorders provides a useful way of evaluating the progress and effectiveness of interventions. In the past dieting has been a marker of such interventions, but with this comes a number of problematic issues. Dieting is not

restricted to people with eating disorders per se and it derives from the core features of eating disorder (i.e. shape and weight over-concern and low self-esteem) rather than being a core feature itself. Hence the assessment of over-concern is a much more appropriate marker of eating disorder psychopathology as it is particular to eating disorders, and if changed affects the whole pathology of that individual rather than the symptomatology.

Increased understanding of shape and weight over-concern can also have a useful impact on primary prevention programmes for children. Just as over-concern is a clear indication of eating disorder psychopathology, it is also an indicator in children of potential problems in the future. However, it must be stressed that over-concern is one of many potential indicators of possible disordered eating problems. For example, low self-esteem is an important area to assess, and dieting will still play a role as it is a key symptomatic feature. Certainly the current study supports the literature showing that those with shape and weight concerns are more likely to be heavier, have low self-esteem and more likely to engage in dietary restraint. Although there are advances in understanding the complex psychopathology and development of eating disorders, it comes as no surprise that assessing this area is also complex in nature. The assessment of shape and weight over-concern provides a means of verifying who to target with prevention programmes, as well as providing a means of evaluating the effectiveness of such programmes. Perhaps most importantly demystifying over-concern and increasing its tangibility informs the content and structure of the prevention programmes themselves, enhancing and increasing the appropriateness of their aims.

The implicit attitudes findings using the Teachman and Brownell methodology (2001) has identified strong implicit anti-fat attitudes amongst children of a very young age. This highlights how society's perception of being overweight has been absorbed and carried by children at least as young as nine years of age. Although this is not surprising (Richardson et al, 1961, found 10-year-olds least preferring an overweight child compared to one with a facial disfigurement or in a wheelchair), it is still of concern when we look at the literature on the effects of such attitudes. For instance, overweight children have been shown to have poorer self-

esteem, be more likely to be bullied, and have less peer friendships (Pierce and Wardle, 1997, Neumark-Sztainer et al, 1998, and Hill and Murphy, 1999) in comparison to their thinner peers. Of course the stigma remains in adult life alongside the effect on everyday living (Puhl and Brownell, 2001). Therefore, it is highly important that these attitudes and stereotypes are assessed and tackled in young children if their psychological impact is to be reduced. Anti-fat attitudes and stereotypes could provide a potential focus for future educational initiatives. Currently, there is an extensive focus on childhood obesity coming from the government. However, this can only emphasise the stigma attached to being overweight or obese, exacerbating the problems in other areas such as anti-fat biases and subsequent discrimination and psychological trauma. The government and BMA Board of Science and Education have also recommended targeting the media and its impact on perceptions of body shape and healthy eating (BMA, 2000). But what is known about the effects of the media on this area is that those children or adults who are already over-concerned with shape and weight or have general shape and weight concerns are likely to be effected by what the media portrays. Therefore, it seems sensible to tackle the issue of shape and weight concern and anti-fat attitudes rather than the media per se, at least initially. The current measure of implicit attitudes indicates how transient a problem anti-fat bias is and also gives a means of assessing changes in attitudes (in children and adults) if they were to be tackled.

The findings in the current study provide more information on the differentiation of girls and boys in developing shape and weight over-concern, especially in respect of when this split occurs. The study adds weight to the argument that girls have an increased tendency to be over-concerned or have general concerns about shape and weight in comparison with boys after ten years of age. It seems more likely to occur as children head into their adolescence. If the period where the gender differentiation occurs can be identified, this has implications for understanding what factors play a role in this differentiation between the sexes.

4.5 Methodological Issues

4.5.1 Limitations of study

Considering study limitations, it is possible that some of the items within the shape and weight perceived importance scale may have made less sense for the boys than the girls as well as some of the items making less sense as an importance item than a concern item. Certainly some of the items slightly reduced the internal reliability of the scales. Before any changes are made to the items the scales should be used in an older age group.

All the measures were administered in large groups. The advantage of this was being able to collate a large amount of data via a means which reduced the amount of interruption the children and schools experienced when they took part in the study. This may have had a consequence of some children completing the tasks without total comprehension of what was expected of them, feeling unable to request assistance when stuck, answering the questions randomly and very likely increased copying between the children who sat next to each other. The latter problem would also have implications in children being aware that their peers may have seen their responses, therefore they may have felt the need to not be as honest as they would have liked. This emphasises the sensitive nature of the information being collected and the need for careful handling of the data and in working with the children. However, the researcher was very aware of these issues during administering the tasks and was able to ensure the teachers involved were also aware of these possibilities. As a result some of the data were excluded from the analysis following either the researcher or the teacher feeling one of these issues may have arisen.

The use of class-sized groups may have been particularly problematic with the Implicit Attitudes Test, where the timing was a crucial part of the task as was a clear understanding of what to do. Ideally the task would have been administered using a computer which would have had the likely impact of increasing the sensitivity of the measure. The original administration of the IAT by Greenwald et al (1998) requested participants to sit at a computer from which they received all their instructions. They provided all of their responses via the computer keyboard giving left responses with their left forefinger using the 'A' key and right responses

with their right forefinger using the '5' key on the numeric keypad. The use of computers was not feasible for the current study. Therefore, it may have been more effective to collate the data using the current study's administration, on a one-to-one basis. Although this may have reduced the number of data sets that were excluded from the analysis, this would have had time implications in collating the data as well as increasing the levels of interruption the schools and children experienced. The mechanisms that were put in place ensured that potential language and reading difficulties were identified. These stringent rules have on face value appeared have been effective, as more boys than girls had their data excluded from further analysis. In primary school, girls are known to have better reading abilities than boys, and so it would have been predicted that more boys than girls experienced difficulties in a timed reading task and this was found.

No individual reading ages of the children were obtained, and so it was not possibly to identify each child's individual reading ability. Alongside the IAT it may have been useful for the revised SPPC measure, which is a longer assessment and involves a lot of reading. However, the detail which was obtained from this measure potentially outweighed this problem in that it produced a lot of information on self-esteem and developed clear categories for children with or without shape and weight concern and perceived importance. One answer to the lengthy nature of the assessment, which may have encouraged loss of concentration, was to ensure those who were struggling received assistance, whether they had requested help or not.

The assessment of the children's estimates of their height and weight was particularly confounded by the confusion children experienced in distinguishing the metric and imperial systems. Children used a mixture of both and sometimes would put one when they meant another. It was also likely that this task was too difficult for Year 5 children to undertake and may be more relevant to older children, i.e. adolescents.

The socio-economic status of the children was not assessed. The schools used in the current study were more from rural than inter-city urban locations. Although this is very unlikely to have impacted on the results it may be something to consider in future research. For example implicit attitudes towards being overweight

may vary according to socio-economic status of a child. As described earlier, it has been shown children from higher SES schools assigned fewer positive characteristics to fat figures than those from low SES schools (Wardle et al, 1995).

4.5.2 Future research

The current study would need to be repeated to explore whether these findings can be replicated in different age groups as well as same-aged peers. This would be particularly useful in exploring at which point the gender differentiation in shape and weight concerns or over-concern develops. This may then inform hypotheses as to what mediates this change and the differentiation between the sexes. It would also be useful in investigating when shape and weight perceived importance starts to play more of a role in shape and weight over-concern, or in identifying if it does play a key role.

It may be useful to re-evaluate the shape and weight concern measure but more so the perceived importance measure, in respect of strengthening their properties, informing their relationship with dietary restraint and in developing the conceptualisation of shape and weight over-concern.

It would also be necessary to further research implicit attitudes in children towards being overweight. As the current study has found such strong universal anti-fat attitudes amongst nine and ten year olds, one question is whether these findings are replicable? At what age do these attitudes start to become so prevalent and are there differences between those who are over-concerned with shape and weight and those who are not? If so, how can they be measured? This calls for revisiting the adaptations of the IAT. For instance can the measure be made more child friendly, to increase comprehension of the task and take account of differing reading abilities? Would the sensitivity of the task be aided by its administration through the use of a computer or possibly collated on an individual basis? Other areas of importance are identifying what makes these anti-fat attitudes worse, whether some children do not hold these attitudes at all, and if so identifying what protects them. This may inform programmes which aim to change individuals'

implicit anti-fat attitudes and increase the understanding of how such attitudes will in the long-term impact on shape and weight over-concern and other variables such as self-esteem and dietary restraint.

4.6 Conclusion

The current study has developed scales measuring body shape and weight concern and perceived importance. Information gathered on these scales suggests they have adequate properties for use in primary school children. Body shape and weight over-concern, as described by Fairburn (1997), has been operationalised as shape and weight concern alongside its perceived importance. The evidence provided by the current study suggests this conceptualisation of over-concern is an acceptable one and a good assessment of body shape and weight over-concern has been developed.

As expected, the study found children with high shape and weight concern were more likely to be heavier, have low self-esteem and be more dissatisfied with their body shape, in comparison with those who reported low concern about shape and weight. Children with high shape and weight concern and perceived importance were more likely to engage in restrained eating than those with low concern and perceived importance. No gender difference was observed on the two scales as was expected, and this was thought to reflect such a differentiation occurring later in life. Dietary restraint was a highly significant contributing factor to being over-concerned for the girls and boys, as was global self-worth (for the boys) and physical appearance (for the girls). The children as a whole showed strong implicit anti-fat attitudes, but no differences were found between the groups as expected and this was thought to reflect methodological issues. This study identifies that shape and weight over-concern can be found in children as young as nine years of age. Furthermore, by age nine children are aware of the stigma attached to being overweight and possess strong negative attitudes against being fat.

Body shape and weight over-concern is a driving force towards an individual developing an eating disorder. Therefore, the generation of an assessment of shape

and weight over-concern has preventative as well as clinical intervention implications, as does increasing the understanding of the role of over-concern in the development of eating disorders. Identifying a clear anti-fat bias amongst children as young as nine-years-old also has implications for school-based prevention and education programmes. The current drive in targeting childhood obesity and the media impact on body shape perceptions and healthy eating, may exacerbate such pervasive problems as attitudes and stereotypes towards being overweight. This has implications for the psychological well-being of children and adults as well as the prejudice that is so evident in society.

For these findings to be taken further the conceptualisation and assessment of shape and weight over-concern will need to be refined. Over-concern will also need to be further investigated in its relationship with other key factors such as self-esteem and dietary restraint, as well as more social factors such as gender and weight. The current study has joined together the issues of body shape and weight over-concern and the implicit attitudes towards being overweight. These areas, being little researched together, also require additional investigation in respect of their relationship and how one can affect the other.

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APPENDICES

Appendix 1

Table of Items from the Shape Concern and Weight Concern Subscales from the EDE-Q

The right-hand column shows the items chosen from the EDE-Q from which the themes were used in the new shape and weight concern and perceived importance scales.

EDE-Q Shape Concern Subscale Items	EDE-Q Weight Concern Subscale Items	Chosen EDE-Q items used for new scales
Have you definitely wanted your stomach to be flat? (Q.10)		
Has thinking about shape or weight made it difficult to concentrate on things you are interested in, for example, reading, watching TV or following a conversation? (Q.11)	Has thinking about shape or weight made it difficult to concentrate on things you are interested in, for example, reading, watching TV or following a conversation? (Q.11)	
Have you had a definite fear that you might gain weight or become fat? (Q.12)		Have you had a definite fear that you might gain weight or become fat? (Q.12)
Have you felt fat? (Q.13)		Have you felt fat? (Q.13)
	Have you had a strong desire to lose weight? (Q.14)	Have you had a strong desire to lose weight? (Q.14)
Has your shape influenced how you think about or judge yourself as a person? (Q.30)		Has your shape influenced how you think about or judge yourself as a person? (Q. 30)
	How much would it have upset you if you had been told to weight yourself once a week for the next four weeks? (Q.31)	
How dissatisfied have you felt about your shape? (Q.33)	How dissatisfied have you felt about your weight? (Q.32)	How dissatisfied have you felt about your weight / shape? (Q. 32 & 33)

EDE-Q Shape Concern Subscale Items	EDE-Q Weight Concern Subscale Items	Chosen EDE-Q items used for new scales
How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath? (Q.35)		How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath? (Q.35)
How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothing? (Q.36)		

Appendix 2

Table of EDE-Q, Body Shape and Weight Concern and Perceived Importance Items

The left-hand column identifies the items chosen from the EDE-Q from which the themes were used to create the new body shape and weight concern and perceived importance items (middle and right-hand columns).

EDE-Q Items	**Shape and Weight Concern Scale Items**	**Shape and Weight Perceived Importance Scale Items**
Have you had a definite fear that you might gain weight or become fat? (Q.12)	Some children worry *a lot* about becoming fat **BUT** Other children *don't* worry at all about becoming fat. (Q. 3)	Some children think it's important *not* to become fat **BUT** Other children *don't* think becoming fat is all that important. (Q. 27)
How dissatisfied have you felt about your weight / shape? (Q. 32 & 33)	Some children *don't* worry about their body shape or weight **BUT** Other children worry *a lot* about their body shape or weight. (Q. 7)	Some children think their shape or weight is the *most* important thing about themselves **BUT** Other children think *other things* about them are more important than their shape or weight. (Q. 31)
Have you felt fat? (Q. 13)	Some children *don't* worry at all about feeling fat **BUT** Other children worry a lot about feeling fat. (Q. 11)	Some children think feeling fat is *not* all that important **BUT** Other children think that to feel *good* about themselves, it`s important not to feel fat. (Q. 35)
Has your shape influenced how you think about or judge yourself as a person? (Q. 30). Have you had a definite fear that you might gain weight or become fat? (Q. 12)	Some children *worry* about not being thin **BUT** Other children worry more about *other things* than not being thin. (Q. 15)	Some children *don't* think being thin is all that important to how they feel about themselves **BUT** Other children think it`s *important* to be thin. (Q. 39)

EDE-Q Items	Shape and Weight Concern Scale Items	Shape and Weight Perceived Importance Scale Items
How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower? (Q. 35)	Some children are very *comfortable* about seeing the shape of their body in a mirror **BUT** Other children *worry a lot* about seeing their body shape. (Q. 19)	Some children think it's important to *not* look at their body shape in a mirror **BUT** Other children *don't* think it's important to avoid looking at their own body shape. (Q. 43)
Have you had a strong desire to lose weight? (Q. 14)	Some children *worry* about being able to lose weight **BUT** Other children worry about *other things* more than being able to lose weight. (Q. 23)	Some children *don't* think it's important to lose weight **BUT** Other children think losing weight is *very* important. (Q. 47)

Appendix 3

Items from the Body Shape and Weight Concern and Perceived Importance Scales

Body Shape And Weight Concern Items

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
H 3	☐	☐	Some children worry *a lot* about becoming fat	**BUT**	Other children *don't* worry at all about becoming fat.	☐	☐
H 7	☐	☐	Some children *don't* worry about their body shape or weight	**BUT**	Other children worry *a lot* about their body shape or weight.	☐	☐
H 11	☐	☐	Some children *don't* worry at all about feeling fat	**BUT**	Other children worry *a lot* about feeling fat.	☐	☐
H 15	☐	☐	Some children *worry* about not being thin	**BUT**	Other children worry more about *other things* than not being thin.	☐	☐
H 19	☐	☐	Some children are very *comfortable* about seeing the shape of their body in a mirror	**BUT**	Other children *worry a lot* about seeing their body shape.	☐	☐
H 23	☐	☐	Some children *worry* about being able to lose weight	**BUT**	Other children worry about *other things* more than being able to lose weight.	☐	☐

Body Shape And Weight Perceived Importance Items

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
H 27	☐	☐	Some children think it's important *not* to become fat	**BUT**	Other children *don't* think becoming fat is all that important.	☐	☐
H 31	☐	☐	Some children think their shape or weight is the *most* important thing about themselves	**BUT**	Other children think *other things* about them are more important than their shape or weight.	☐	☐
H 35	☐	☐	Some children think feeling fat is *not* all that important	**BUT**	Other children think that to feel *good* about themselves, it's important not to feel fat.	☐	☐
H 39	☐	☐	Some children *don't* think being thin is all that important to how they feel about themselves	**BUT**	Other children think it's *important* to be thin.	☐	☐
H 43	☐	☐	Some children think it's important to *not* look at their body shape in a mirror	**BUT**	Other children *don't* think it's important to avoid looking at their own body shape.	☐	☐
H 47	☐	☐	Some children *don't* think it's important to lose weight	**BUT**	Other children think losing weight is *very* important.	☐	☐

Appendix 4

SPPC - Self-Esteem Measure with Immersed Items of Body Shape and Weight Concern and Perceived Importance Scales

WHAT I AM LIKE

Name _____

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
	☐	☐	Some children would rather play outdoors in their spare time	**BUT**	Other children would rather watch TV.	☐	☐
	Really True For Me	**Sort of True For Me**				**Sort of True For Me**	**Really True For Me**
1	☐	☐	Some children feel that they are very *good* at their school work	**BUT**	Other children *worry* about whether they can do the school work set for them.	☐	☐
2	☐	☐	Some children find it *hard* to make friends	**BUT**	Other children find it's pretty *easy* to make friends.	☐	☐
3	☐	☐	Some children worry *a lot* about becoming fat	**BUT**	Other children *don't* worry at all about becoming fat.	☐	☐
4	☐	☐	Some children do very *well* at all kinds of sports	**BUT**	Other children *don't* feel that they are very good when it comes to sports.	☐	☐
5	☐	☐	Some children are *happy* with the way they look	**BUT**	Other children are *not* happy with the way they look.	☐	☐
6	☐	☐	Some children often do *not* like the way they *behave*	**BUT**	Other children usually *like* the way they behave.	☐	☐
7	☐	☐	Some children *don't* worry about their body shape or weight	**BUT**	Other children worry *a lot* about their body shape or weight.	☐	☐
8	☐	☐	Some children are often *unhappy* with themselves	**BUT**	Other children are pretty *pleased* with themselves	☐	☐

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
9	☐	☐	Some children feel like they are *just as clever* as other children their age	**BUT**	Other children aren't so sure and *wonder* if they are as clever.	☐	☐
10	☐	☐	Some children have *a lot* of friends	**BUT**	Other children *don't* have very many friends.	☐	☐
11	☐	☐	Some children *don't* worry at all about feeling fat	**BUT**	Other children worry *a lot* about feeling fat.	☐	☐
12	☐	☐	Some children wish they could be a lot *better* at sports	**BUT**	Other children feel they are *good enough* at sports.	☐	☐
13	☐	☐	Some children are *happy* with their height and weight	**BUT**	Other children wish their height and weight were *different*.	☐	☐
14	☐	☐	Some children usually do the *right* thing	**BUT**	Other children often *don't* do the right thing.	☐	☐
15	☐	☐	Some children *worry* about not being thin	**BUT**	Other children worry more about *other things* than not being thin.	☐	☐
16	☐	☐	Some children *don't* like the way they are leading their life	**BUT**	Other children *do* like the way they are leading their life.	☐	☐
17	☐	☐	Some children are pretty *slow* in finishing their school work	**BUT**	Other children can do their school work *quickly*.	☐	☐
18	☐	☐	Some children would like to have a lot *more* friends	**BUT**	Other children have *as many* friends as they want.	☐	☐
19	☐	☐	Some children are very *comfortable* about seeing the shape of their body in a mirror	**BUT**	Other children *worry a lot* about seeing their body shape.	☐	☐

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
20	☐	☐	Some children think they could *do well* at just about any new sports activity they haven't tried before	**BUT**	Other children are afraid they might *not* do well at sports they haven't every tried.	☐	☐
21	☐	☐	Some children wish their body was *different*	**BUT**	Other children *like* their body the way it is.	☐	☐
22	☐	☐	Some children usually act the way they know they are *supposed* to	**BUT**	Other children often *don't* act the way they are supposed to.	☐	☐
23	☐	☐	Some children *worry* about being able to lose weight	**BUT**	Other children worry about *other things* more than being able to lose weight.	☐	☐
24	☐	☐	Some children are *happy* with themselves as a person	**BUT**	Other children are often *not* happy with themselves.	☐	☐
25	☐	☐	Some children often *forget* what they learn	**BUT**	Other children can remember things *easily*.	☐	☐
26	☐	☐	Some children are always doing things with *a lot* of children	**BUT**	Other children usually do things by *themselves*.	☐	☐
27	☐	☐	Some children think it's important *not* to become fat	**BUT**	Other children *don't* think becoming fat is all that important.	☐	☐
28	☐	☐	Some children feel that they are *better* than others their age at sports	**BUT**	Other children *don't* feel they can play as well.	☐	☐
29	☐	☐	Some children wish their physical appearance (how they look) was *different*	**BUT**	Other children *like* their physical appearance the way it is.	☐	☐

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
30	☐	☐	Some children usually get in *trouble* because of things they do	**BUT**	Other children usually *don't* do things that get them in trouble.	☐	☐
31	☐	☐	Some children think their shape or weight is the *most* important thing about themselves	**BUT**	Other children think *other things* about them are more important than their shape or weight.	☐	☐
32	☐	☐	Some children *like* the kind of person they are	**BUT**	Other children often wish they were someone else.	☐	☐
33	☐	☐	Some children do *very well* at their classwork	**BUT**	Other children *don't* do very well at their classwork.	☐	☐
34	☐	☐	Some children wish that more people their age liked them	**BUT**	Other children feel that most people their age *do* like them.	☐	☐
35	☐	☐	Some children think feeling fat is *not* all that important	**BUT**	Other children think that to feel *good* about themselves, it's important not to feel fat.	☐	☐
36	☐	☐	In games and sports some children usually *watch* instead of play	**BUT**	Other children usually *play* rather than just watch.	☐	☐
37	☐	☐	Some children wish something about their face or hair looked *different*	**BUT**	Other children *like* their face and hair the way they are.	☐	☐
38	☐	☐	Some children do things they know they *shouldn't* do	**BUT**	Other children *hardly ever* do things they know they shouldn't do.	☐	☐

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
39	☐	☐	Some children *don't* think being thin is all that important to how they feel about themselves	**BUT**	Other children think it's *important* to be thin.	☐	☐
40	☐	☐	Some children are very *happy* being the way they are	**BUT**	Other children wish they were *different*.	☐	☐
41	☐	☐	Some children have *trouble* working out the answers in school	**BUT**	Other children almost *always* can work out the answers.	☐	☐
42	☐	☐	Some children are *popular* with others their age	**BUT**	Other children are *not* very popular.	☐	☐
43	☐	☐	Some children think it's important to *not* look at their body shape in a mirror	**BUT**	Other children *don't* think it's important to avoid looking at their own body shape.	☐	☐
44	☐	☐	Some children *don't* do well at new outdoor games	**BUT**	Other children are *good* at new games straight away.	☐	☐
45	☐	☐	Some children think that they are *good looking*	**BUT**	Other children think that they are *not* very good looking.	☐	☐
46	☐	☐	Some children behave themselves *very well*	**BUT**	Other children often find it *hard* to behave themselves.	☐	☐
47	☐	☐	Some children *don't* think it's important to lose weight	**BUT**	Other children think losing weight is *very* important.	☐	☐
48	☐	☐	Some children are *not* very happy with the way they do a lot of things	**BUT**	Other children think the way they do things is *fine*.	☐	☐

Name _____

HOW IMPORTANT ARE THESE THINGS TO HOW YOU FEEL ABOUT YOURSELF AS A PERSON?

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
1	☐	☐	Some children think it is important to do well at schoolwork in order to feel good as a person	BUT	Other children don't think how well they do at schoolwork is that important.	☐	☐
2	☐	☐	Some children don't think that having a lot of friends is all that important	BUT	Other children think that having a lot of friends is important to how they feel as a person.	☐	☐
3	☐	☐	Some children think it's important to be good at sports	BUT	Other children don't think how good you are at sports is that important.	☐	☐
4	☐	☐	Some children think it's important to be good looking in order to feel good about themselves	BUT	Other children don't think that's very important at all.	☐	☐
5	☐	☐	Some children think that it's important to behave the way they should	BUT	Other children don't think that how they behave is that important.	☐	☐
6	☐	☐	Some children don't think that getting good marks is all that important to how they feel about themselves	BUT	Other children think that getting good marks is important.	☐	☐
7	☐	☐	Some children think it's important to be popular	BUT	Other children don't think that being popular is all that important to how they feel about themselves.	☐	☐
8	☐	☐	Some children don't think doing well at sports is that important to how they feel about themselves as a person	BUT	Other children feel that doing well at sports is important.	☐	☐
9	☐	☐	Some children don't think that how they look is important to how they feel about themselves as a person	BUT	Other children think that how they look is important.	☐	☐
10	☐	☐	Some children don't think that how they act is all that important	BUT	Other children think it's important to act the way you are supposed to.	☐	☐

Appendix 5

Head Teacher Letter

(Name of Head Teacher
Address of Primary School)

2734

Autumn 2001

Dear (Name of Head Teacher)

I am currently in the final year of a Doctorate course in Clinical Psychology at Leeds University and am conducting, with Dr Andrew Hill, a research project involving Year 5 children in Leeds. We would like to explain a little about the project and what it entails, and would like the opportunity to discuss with you the possibility of undertaking this project in your school.

The project is one of a series of studies that have taken place in the Yorkshire region over the last 10 years, looking at influences on children's shape and weight concerns and perceptions. This particular project is a study looking at children's self-esteem and body shape and weight concerns, in particular the extent of body shape and weight concerns at this age. The study simply involves children being asked to complete questionnaires measuring these issues. The questions asked are straightforward and take between 30 to 40 minutes to complete. All information will be treated as strictly confidential. The parents of the children will be sent a letter asking for their consent to their child's participation, to which they have to reply if they are unwilling to give consent.

For information, I have enclosed a copy of one of the main questionnaires we will be using. It is a very good measure of children's self-esteem and their self-perception of competence in various domains. It continues to be used widely in Britain as well as the U.S.A.

I am looking to include children from up to 10 primary schools. If you feel your school is in a position to help with this study then in return we will be able to provide a summary of the final report and a token payment.

I will be ringing you shortly to discuss the study further and to ask whether your school would be interested in helping with the study. Alternatively you can contact either Andrew Hill or myself on the above telephone number of address.

Can I thank you in advance for your help in this matter.

Yours sincerely,

Caroline Harris, B.Sc.
Clinical Psychologist in Training

Andrew J. Hill, Ph.D., C.Psychol.
Senior Lecturer in Behavioural Sciences

Appendix 6

Parental Consent Letter

CLINICAL PSYCHOLOGY TRAINING PROGRAMMES

From the School of Medicine
Academic Unit of Psychiatry and Behavioural Sciences

15 Hyde Terrace
Leeds LS2 9LT UK

Fax 0113 243 3719
Telephone 0113 233 2732
Direct line 0113 233 + extension number

To the Parents / Guardian of all Year 5 and Year 6 children

Autumn 2001

Dear Parent / Guardian,

We are conducting a research project involving Year 5 and 6 children in Yorkshire. We would like to explain a little about the project and what it entails, and ask for your consent for your child to take part.

The project is a study of children's self-perception and their attitudes towards body shape and weight. The children will be asked to complete questionnaires measuring these issues. The questions asked are straightforward and take only a short time to complete. While we need your child's name to be on the questionnaires, this would be for reference only and would be removed after the questionnaires have been examined. All information will be treated as strictly confidential.

The headteacher has kindly given permission for the school to be involved in this study and for us to approach the parents involved. Can we thank you in advance for allowing your child to take part in this educational and research project. **This requires no further action on your part.** If, however, you are unwilling to consent to your child's participation, would you complete the slip at the bottom of this letter and return it to your child's form teacher.

With many thanks for your help.

Yours sincerely,

Caroline Harris, B.Sc.
Clinical Psychologist in Training

Andrew J. Hill, Ph.D., C.Psychol.
Senior Lecturer in Behavioural Sciences

Only return this slip if you are UNWILLING to allow your child to take part.

I **do not** give my approval for my child ..... (name) to take part in this study.

Signed .....

DIRECTOR: Professor Stephen Morley
x2733 e-mail: s.j.morley@leeds.ac.uk

SECRETARY: Carol Sloman
x2732 e-mail: c.a.sloman@leeds.ac.uk

CLINICAL TUTOR: Dr David Green
x2738 e-mail: d.r.green@leeds.ac.uk

Appendix 7

Body Shape Preferences, Body Shape Satisfaction, Dietary Restraint and Height and Weight Accuracy Measures

Name: Class:

Please answer the following questions as honestly as possible. Most questions simply need you to **circle** the answer you choose. Try not to leave any questions unanswered. If there is anything you don't understand then ask.

1. How tall are you? .....

2. How much do you weigh? .....

3. Do you feel yourself to be

Very much too tall
Moderately too tall
Slightly too tall
About the right height
Slightly too short
Moderately too short
Very much too short

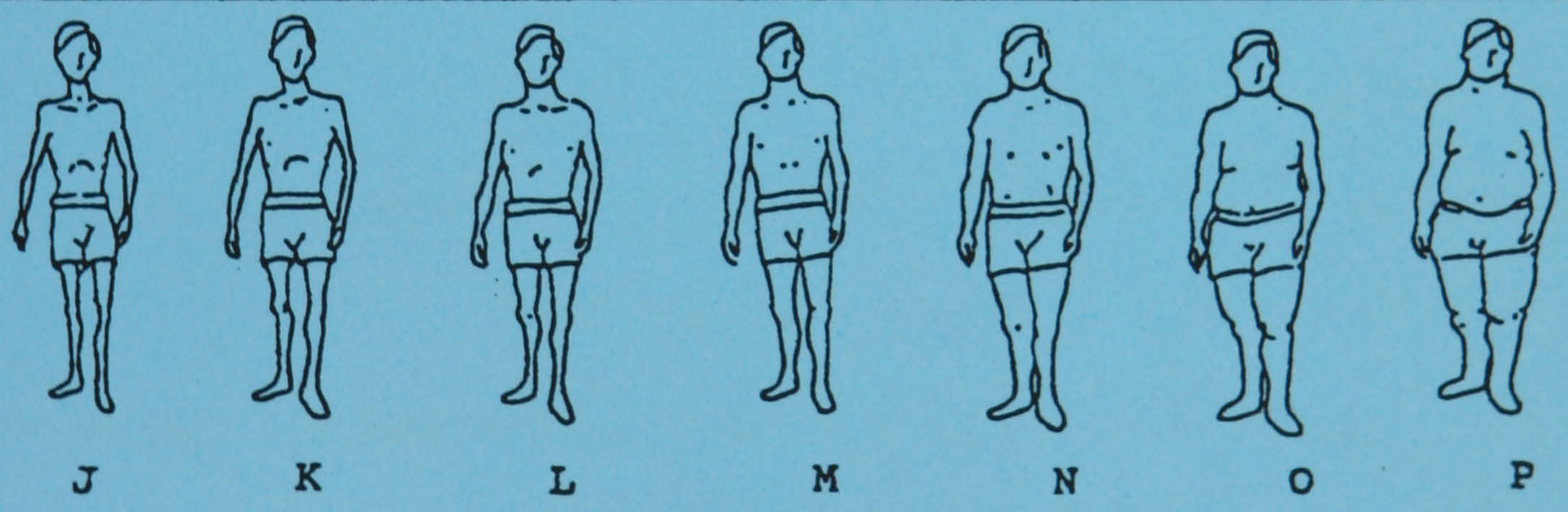
4. Do you feel yourself to be:

Very overweight
Moderately overweight
Slightly overweight
About the right weight
Slightly underweight
Moderately underweight
Very underweight

5. Here are a number of body shapes ranging from very thin to very large. Please pick one letter to describe which figure ....

a) you feel is most like you now .....

b) you would most like to look like .....



6. Which of the following would you describe yourself as (circle only one):

Currently dieting to lose weight

OR

Currently dieting or watching what you eat so as not to put on weight

OR

Not dieting

7. If you have put on weight, do you try to eat less than you usually do?

Never *Seldom* *Sometimes* *Often* *Very often*

8. Do you try to eat less at mealtimes than you would like to eat?

Never *Seldom* *Sometimes* *Often* *Very often*

9. How often do you refuse food or drink offered because you are worried about how much you weigh?

Never *Seldom* *Sometimes* *Often* *Very often*

10. Do you watch exactly how much you eat?

Never *Seldom* *Sometimes* *Often* *Very often*

11. Do you deliberately eat foods that are slimming?

Never *Seldom* *Sometimes* *Often* *Very often*

12. When you have eaten too much, do you eat less than usual on the following days?

Never *Seldom* *Sometimes* *Often* *Very often*

13. Do you deliberately eat less in order not to become heavier?

Never *Seldom* *Sometimes* *Often* *Very often*

14. How often do you try not to eat between meals because you are watching your weight?

Never *Seldom* *Sometimes* *Often* *Very often*

15. How often in the evening do you try not to eat because you are watching your weight?

Never *Seldom* *Sometimes* *Often* *Very often*

16. Do you think about how much you weigh before deciding how much to eat?

Never *Seldom* *Sometimes* *Often* *Very often*

Name: Class:

Please answer the following questions as honestly as possible. Most questions simply need you to **circle** the answer you choose. Try not to leave any questions unanswered. If there is anything you don't understand then ask.

1. How tall are you? .....

2. How much do you weigh? .....

3. Do you feel yourself to be

Very much too tall
Moderately too tall
Slightly too tall
About the right height
Slightly too short
Moderately too short
Very much too short

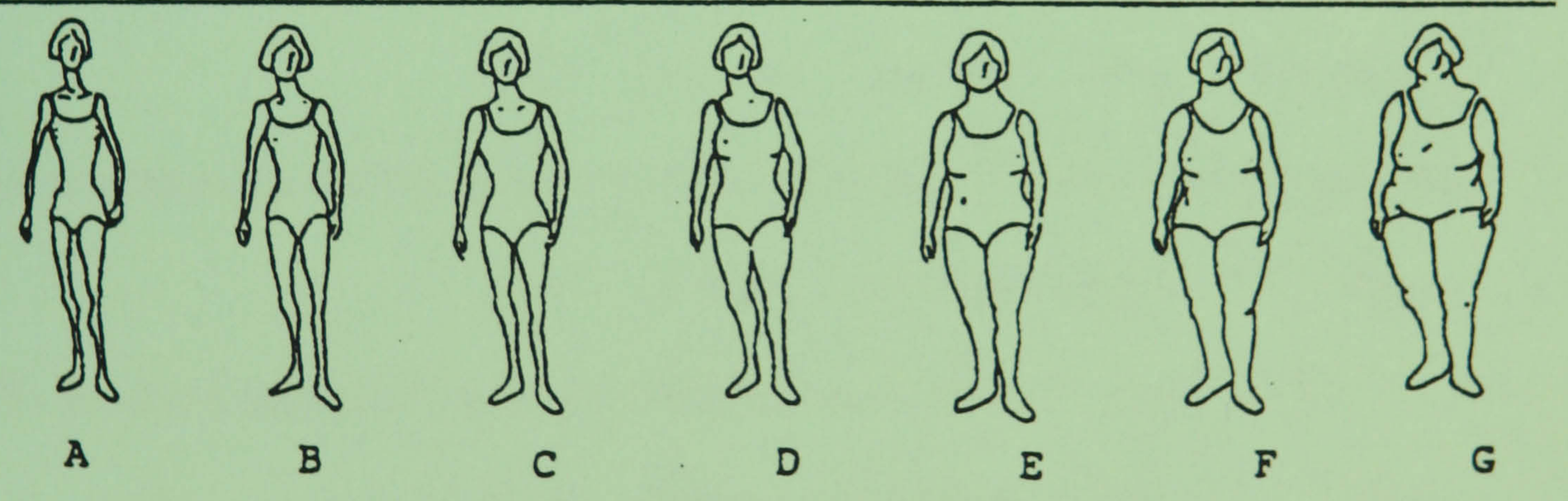
4. Do you feel yourself to be:

Very overweight
Moderately overweight
Slightly overweight
About the right weight
Slightly underweight
Moderately underweight
Very underweight

5. Here are a number of body shapes ranging from very thin to very large. Please pick one letter to describe which figure ....

a) you feel is most like you now .....

b) you would most like to look like .....



6. Which of the following would you describe yourself as (circle only one):

Currently dieting to lose weight

OR

Currently dieting or watching what you eat so as not to put on weight

OR

Not dieting

7. If you have put on weight, do you try to eat less than you usually do?

Never *Seldom* *Sometimes* *Often* *Very often*

8. Do you try to eat less at mealtimes than you would like to eat?

Never *Seldom* *Sometimes* *Often* *Very often*

9. How often do you refuse food or drink offered because you are worried about how much you weigh?

Never *Seldom* *Sometimes* *Often* *Very often*

10. Do you watch exactly how much you eat?

Never *Seldom* *Sometimes* *Often* *Very often*

11. Do you deliberately eat foods that are slimming?

Never *Seldom* *Sometimes* *Often* *Very often*

12. When you have eaten too much, do you eat less than usual on the following days?

Never *Seldom* *Sometimes* *Often* *Very often*

13. Do you deliberately eat less in order not to become heavier?

Never *Seldom* *Sometimes* *Often* *Very often*

14. How often do you try not to eat between meals because you are watching your weight?

Never *Seldom* *Sometimes* *Often* *Very often*

15. How often in the evening do you try not to eat because you are watching your weight?

Never *Seldom* *Sometimes* *Often* *Very often*

16. Do you think about how much you weigh before deciding how much to eat?

Never *Seldom* *Sometimes* *Often* *Very often*

Appendix 8

Implicit Associations Test (Word Sorting)

Name: Date: *a*

Word sorting

Look at each of the boxes below and at the words in the word groups. Then look at the word list below these. For each word show the group to which it belongs by ticking the box on the left or right. Work your way down each side of the page. Do not skip any words but do as many as you can, as fast as you can. If you make a mistake just carry on.

Word groups

Flowers
daisy
tulip
daffodil
+
Good
lovely
excellent
great

Insects
earwig
wasp
beetle
+
Bad
nasty
horrible
awful

Flowers + Good		**Insects + Bad**	**Flowers + Good**		**Insects + Bad**
Example			☐	excellent	☐
☑	tulip	☐	☐	daffodil	☐
☐	nasty	☑	☐	awful	☐
			☐	daisy	☐
☐	great	☐	☐	wasp	☐
☐	earwig	☐	☐	nasty	☐
☐	daffodil	☐	☐	great	☐
☐	awful	☐	☐	beetle	☐
☐	wasp	☐	☐	lovely	☐
☐	excellent	☐	☐	tulip	☐
☐	nasty	☐	☐	horrible	☐
☐	lovely	☐	☐	earwig	☐
☐	beetle	☐	☐	excellent	☐

Word groups

Thin people	**Fat people**
thin	fat
slim	heavy
skinny	podgy
+	+
Good	**Bad**
lovely	nasty
excellent	horrible
great	awful

Thin people + Good		**Fat people + Bad**
☐	slim	☐
☐	excellent	☐
☐	awful	☐
☐	podgy	☐
☐	skinny	☐
☐	great	☐
☐	fat	☐
☐	lovely	☐
☐	nasty	☐
☐	heavy	☐
☐	horrible	☐
☐	thin	☐
☐	great	☐
☐	awful	☐
☐	podgy	☐
☐	slim	☐
☐	excellent	☐
☐	nasty	☐

Thin people + Good		**Fat people + Bad**
☐	fat	☐
☐	skinny	☐
☐	great	☐
☐	heavy	☐
☐	horrible	☐
☐	lovely	☐
☐	thin	☐
☐	awful	☐
☐	great	☐
☐	podgy	☐
☐	nasty	☐
☐	lovely	☐
☐	excellent	☐
☐	heavy	☐
☐	skinny	☐
☐	horrible	☐
☐	fat	☐
☐	slim	☐

Page 3

Word groups

Thin people
thin
slim
skinny
+
Bad
nasty
horrible
awful

Fat people
fat
heavy
podgy
+
Good
lovely
excellent
great

Thin people + Bad		**Fat people + Good**
☐	great	☐
☐	skinny	☐
☐	podgy	☐
☐	lovely	☐
☐	nasty	☐
☐	fat	☐
☐	skinny	☐
☐	awful	☐
☐	slim	☐
☐	horrible	☐
☐	heavy	☐
☐	excellent	☐
☐	nasty	☐
☐	skinny	☐
☐	fat	☐
☐	lovely	☐
☐	thin	☐
☐	awful	☐

Thin people + Bad		**Fat people + Good**
☐	great	☐
☐	podgy	☐
☐	horrible	☐
☐	slim	☐
☐	excellent	☐
☐	heavy	☐
☐	nasty	☐
☐	thin	☐
☐	great	☐
☐	fat	☐
☐	lovely	☐
☐	skinny	☐
☐	awful	☐
☐	podgy	☐
☐	excellent	☐
☐	slim	☐
☐	heavy	☐
☐	horrible	☐

Name: Date: *b*

Word sorting

Look at each of the boxes below and at the words in the word groups. Then look at the word list below these. For each word show the group to which it belongs by ticking the box on the left or right. Work your way down each side of the page. Do not skip any words but do as many as you can, as fast as you can. If you make a mistake just carry on.

Word groups

Flowers
daisy
tulip
daffodil
+
Good
lovely
excellent
great

Insects
earwig
wasp
beetle
+
Bad
nasty
horrible
awful

Flowers + Good		**Insects + Bad**
Example		
☑	tulip	☐
☐	nasty	☑
☐	great	☐
☐	earwig	☐
☐	daffodil	☐
☐	awful	☐
☐	wasp	☐
☐	excellent	☐
☐	nasty	☐
☐	lovely	☐
☐	beetle	☐

Flowers + Good		**Insects + Bad**
☐	excellent	☐
☐	daffodil	☐
☐	awful	☐
☐	daisy	☐
☐	wasp	☐
☐	nasty	☐
☐	great	☐
☐	beetle	☐
☐	lovely	☐
☐	tulip	☐
☐	horrible	☐
☐	earwig	☐
☐	excellent	☐

Page 2

Word groups

Thin people	**Fat people**
thin	fat
slim	heavy
skinny	podgy
+	+
Bad	**Good**
nasty	lovely
horrible	excellent
awful	great

Thin people + Bad		**Fat people + Good**
☐	great	☐
☐	skinny	☐
☐	podgy	☐
☐	lovely	☐
☐	nasty	☐
☐	fat	☐
☐	skinny	☐
☐	awful	☐
☐	slim	☐
☐	horrible	☐
☐	heavy	☐
☐	excellent	☐
☐	nasty	☐
☐	skinny	☐
☐	fat	☐
☐	lovely	☐
☐	thin	☐
☐	awful	☐

Thin people + Bad		**Fat people + Good**
☐	great	☐
☐	podgy	☐
☐	horrible	☐
☐	slim	☐
☐	excellent	☐
☐	heavy	☐
☐	nasty	☐
☐	thin	☐
☐	great	☐
☐	fat	☐
☐	lovely	☐
☐	skinny	☐
☐	awful	☐
☐	podgy	☐
☐	excellent	☐
☐	slim	☐
☐	heavy	☐
☐	horrible	☐

Word groups

Thin people	**Fat people**
thin	fat
slim	heavy
skinny	podgy
+	+
Good	**Bad**
lovely	nasty
excellent	horrible
great	awful

Thin people + Good		**Fat people + Bad**
☐	slim	☐
☐	excellent	☐
☐	awful	☐
☐	podgy	☐
☐	skinny	☐
☐	great	☐
☐	fat	☐
☐	lovely	☐
☐	nasty	☐
☐	heavy	☐
☐	horrible	☐
☐	thin	☐
☐	great	☐
☐	awful	☐
☐	podgy	☐
☐	slim	☐
☐	excellent	☐
☐	nasty	☐

Thin people + Good		**Fat people + Bad**
☐	fat	☐
☐	skinny	☐
☐	great	☐
☐	heavy	☐
☐	horrible	☐
☐	lovely	☐
☐	thin	☐
☐	awful	☐
☐	great	☐
☐	podgy	☐
☐	nasty	☐
☐	lovely	☐
☐	excellent	☐
☐	heavy	☐
☐	skinny	☐
☐	horrible	☐
☐	fat	☐
☐	slim	☐

Appendix 9

List of Abbreviations

BMI	**Body Mass Index**
C	**main effect of body shape and weight concern**
ChEAT	**Children's version of the Eating Attitudes Test**
EDE	**Eating Disorder Examination**
EDE-Q	**Eating Disorder Examination Questionnaire**
G	**main effect of gender**
I	**main effect of body shape and weight importance**
IA	**implicit attitude**
IAT	**Implicit Association Test**
NAO	**National Audit Office**
SAWBS-A	**Shape and Weight-Based Self-Esteem inventory – Adolescent version**
SPPC	**Self-Perception Profile for Children**