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Weight, Eating Behaviour and Psychosocial Well-Being of Adolescent Boys and Girls

Evelyn Schliecker

A Thesis

in

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ABSTRACT

Weight, Eating Behaviour and Psychosocial Well-Being
in Adolescent Boys and Girls

Evelyn Schliecker, Ph.D.
Concordia University, 1995

The present study provides a synthesis of information regarding obesity, restrained and disinhibited eating and psychosocial well-being of adolescent boys and girls. Each of these constructs has been studied extensively among college-age and adult populations. Research with adolescent populations has only begun to proliferate in recent years, and the tendency has been to focus either on obesity and its treatment or on eating disorders. Relatively little is known about how obesity and eating behaviour on one hand relate to psychosocial well-being on the other.

In order to examine the relations between weight, eating behaviour and psychosocial well being, 532 adolescents, 279 boys and 253 girls, provided information about their restrained and disinhibited eating, self- and appearance esteem, perceived stress, family functioning and their perceptions of the availability of social support from parents, classmates, teachers and friends. Data were analyzed first by canonical correlation in order to explore the relation between eating regulation and psychosocial well-being for boys and girls. The self- and relational perceptions were then examined as a function of (1) weight status, (2) restraint status and (3) disinhibition status.

The results of the present study suggest that eating behaviour, either

restrained or disinhibited, and not weight status is associated with deficits in adolescent psychosocial well-being. Highly restrained boys and girls reported lower appearance esteem than adolescents who did not restrain their eating; however, only girls also reported lower global self-worth and poor family psychological health as a function of restraint status. Highly disinhibited boys and girls reported higher perceived stress and lower teacher support/regard than their low disinhibition counterparts, but only girls also reported lower global self-worth as a function of disinhibition status. The only psychosocial variable to differ significantly as a function of weight status was lower appearance esteem among overweight boys and girls.

Finally, it was found that when high weight, highly restrained eating, high disinhibition and high perceived hunger co-occurred, boys did not feel good about themselves, their appearance or their ability to cope with everyday events in their lives.

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This investigation is an exploration of the inter-relations among body weight, restrained and disinhibited eating and psychosocial well-being of adolescent boys and girls. There is a consensus that dieting has become normative in North America and the prevalence of unhealthy dieting practices is causing some concern among health care providers (Polivy & Herman, 1987; Striegel-Moore, Silberstein, & Rodin, 1986). Subclinical manifestations of eating disorders, or unhealthy dieting, are much higher than clinically diagnosed disorders (Graber, Brooks-Gunn, Paikoff, & Warren, 1994) and seem to begin in adolescence (Vollrath, Koch, & Angst, 1992). For some teenagers, obesity, dieting and food related concerns are more than transitory phenomena. Approximately 20% of Canadian teenagers are sufficiently overweight to cause concern about medical and psychological consequences of their weight status (Lechky, 1994; Stephens & Craig, 1990) and it is estimated that between 45% and 65% of high school and college-age women are dieting to lose weight (Horm & Anderson, 1993; Rosen, Gross, & Vara, 1987). At least 80% of obese adolescents are likely to maintain their high weight throughout adulthood (Mendoca & Brehm, 1983; Harlan, 1993) and 2% to 4% of adult women meet the criteria for anorexia nervosa and bulimia nervosa (APA, 1994). The prevalence of eating disorders among men is about one-tenth the rate for women (APA, 1994).

Obesity and chronic dieting have been associated with a pre-occupation with food, emotional eating, binge eating and the development of eating

disorders in college age women. Moreover, low self-esteem, conflicted or less than optimal family functioning, poor interpersonal relationships and emotional factors related to stress and coping have been linked to eating disorders and to obesity (Garner, Rockert, Olmstead, Johnson, & Cosuna, 1985; Patton, Johnson-Sabine, Wood, Mann, & Wakeling, 1990; Polivy & Herman, 1983, 1985; Striegel-Moore, Silberstein, & Rodin, 1986; Wooley & Wooley, 1984).

There has been a recent increase in the number of studies examining eating regulation among adolescents, yet very few of those address the psychological concomitants of eating regulation and obesity. When obesity has been the focus, treatment and weight loss have been emphasized. The absence of a synthesis of psychological and social issues on one hand and weight and eating behaviour on the other, especially among adolescents, provided the impetus for the current work. The aim of the present investigation is to examine the self perceptions, interpersonal environment, and restrained and disinhibited eating of adolescent boys and girls, in a large non-clinical sample, across a wide range of body weights. Four research questions will be addressed. The first issue to be examined concerns the way in which weight and eating behaviour are related to psychosocial well-being for boys and girls. The second question of interest concerns possible differences in eating behaviour and psychosocial well-being as a function of adolescent weight status. Thirdly, the question of psychosocial deficits among adolescents who are excessively restrained or disinhibited eaters will be addressed. Finally, each

of these questions will be examined in terms of gender differences in anomalous eating.

Background

Global self-worth and appearance esteem

Self-esteem is the psychological correlate thought to be most severely impaired in relation to disordered eating (Dykens & Gerrard, 1986) and may be the bridge by which disordered eating and obesity can be conceptually linked. The obese, as well as those suffering from eating disorders, have been characterized as having low self-esteem. For some researchers and clinicians low self-esteem is considered to be a core feature of obese and non-obese disordered eating (Fairburn, Marcus, & Wilson, 1993).

We all have intuitive ideas of what self-esteem is, however operational definitions are often lacking. One of the problems in comparing studies investigating self-esteem is the use of different measuring instruments based on different conceptualizations. For example, the Coopersmith Self-Esteem Inventory (Coopersmith, 1975) and the Piers-Harris Children's Self-Concept Scale (Piers & Harris, 1969) are two measures commonly used over the last two decades, yet each measures self-esteem in a different way. Both of these instruments use an aggregate of scores from different domains of the self to generate a general self-concept or self-esteem rating, but they differ with respect to the domains of the self which are measured. The Coopersmith

(1975) measure contains no appearance-related items, while the Piers-Harris (1969) has nine appearance items. When a specific domain of the self is common across measures, they may differ with respect to the percentage of items sampled from that domain. Finally, some theorists have argued that general self-esteem is something other than an aggregate of domains of the self-concept. Rosenberg (1979) argued that general self-esteem is a separate construct related to how the individual feels about him/herself in general and he developed a 10-item questionnaire reflecting this idea. According to his argument, research using aggregate scores to determine self-esteem are not measuring general self-esteem but rather a conceptually different construct. That is, aggregate measures do not tell us about the individual's general sense of psychological well-being.

Harter (1982) addressed Rosenberg's general self-esteem concept as well as the multi-faceted nature of self-perceptions in her development of the Perceived Competence Scale for Children and later in the Self-Perception Profile for Adolescents (Harter, 1988). Her measures of the self reflect the idea that perceived competence in domains important to different developmental stages should be assessed in addition to a domain-free scale of global self-worth. The adolescent scale (Harter, 1988) includes eight domains of competence: scholastic, social acceptance, athletic, physical appearance, job competence, romantic appeal, behavioral conduct, and friendship. Instead of summing the scores from these scales to arrive at a self-esteem score, a five-item global

scale taps the extent to which the adolescents like themselves as people and are happy about the way they are leading their lives. The two scales of interest in the current investigation are global self-worth and physical appearance. These two features of the self are highly correlated throughout the lifespan (Harter, 1988) and are often linked with obesity and disordered eating.

Gender differences in the self-esteem of adolescents are well documented in the literature. Girls are more dissatisfied with their bodies than are boys (Clifford, 1971); they perceive their overall body image less positively (Tobin-Richards, Boxer, & Peterson 1983); they are more self-conscious, have greater instability in their self-image and have lower self-esteem than do same-age boys (Simmons & Rosenberg, 1975).

If adolescent girls in general feel less good about themselves, their bodies and the images they portray then what about the overweight or obese adolescent, or the underweight boy? Conventional wisdom, supported by clinical impression, depicts overweight girls as unhappy, suffering from low self-esteem, and living in non-supportive, rejecting families (Allon, 1979; Bruch, 1973; Minuchin, Rosman, & Baker, 1978). Much less has been said about the overweight boy, although some clinicians, have reported self-esteem deficits of boys in treatment for their obesity (e.g., Bruch, 1973). These ideas are widely held, but research supports only some of the clinical conclusions. It is interesting to note that obesity is not included in DSM-IV (APA, 1994) because "it has not been established that it is consistently associated with a

psychological or behavioral syndrome" (p. 539). The study of the psychological concomitants of adolescent boys who are small relative to their peers has been relatively neglected.

Despite clinical impressions, the empirical evidence that overweight youngsters suffer from deficits in self-esteem is equivocal. Some studies have found only small, clinically insignificant deficits (e.g., Kaplan & Wadden, 1986), or no deficits (Mendelson & White, 1982) or the results were modified by sex and age (Mendelson & White, 1985). In those studies, aggregate measures of self-esteem were used, thus it is unclear exactly what was measured. There is also ambiguity among studies measuring general self-esteem. For example, Martin, et al. (1988) reported lower scores on Rosenberg's self-esteem scale for girls described as overweight as did Banis, et al. (1988) using Harter's global self-worth scale. In the former study, the authors reported their subjects to be at the 75th percentile of weight for their age, suggesting at the least moderate overweight, but neither BMI nor relative weight were reported. It would have been informative to know the range of subjects' weight. In the latter study, the overweight sample data was compared to data obtained by Harter for the purpose of establishing norms for the scales. A more conclusive comparison would have included data from normal weight children drawn from the same population as that of the overweight children. Another group of investigators using the Rosenberg Self-Esteem Scale reported that neither deviation from average weight nor deviation from desired weight was related to self-esteem in

a large sample of high school students with a wide range of weight status (Rosen, Gross, & Vara, 1987). Mendelson, White, and Mendelson (1992) studied the self-esteem of children aged 7 to 16 years across a wide range of body weight. They found no weight related deficits in global self-worth on the Harter scale.

The reasons for the discrepancies across studies of obesity and self-esteem are not entirely clear, and raise important questions. Certainly, the use of different measures of self-esteem has contributed to the confusion, as have the vague and differing definitions of obesity and overweight. The absence of consistent empirical results may also be an indicator of the heterogeneity of the obese population or may be a reflection of an unmeasured correlate of obesity. In contrast to the inconsistency of empirical evidence, the consistency of clinical observations may reflect the increased pathology of individuals presenting themselves for treatment, or may simply reflect widespread stereotyping of the obese. Health care professionals who often see obese patients with low self-esteem may be erroneously assuming a causal relationship.

Evidence for poor self-esteem among the obese may be inconsistent but deficits in appearance esteem, or body esteem, among the obese are well documented in the literature for child and adult samples (Mendelson, White, & Mendelson, 1992; Mendelson & White, 1982, 1985; Stunkard & Mendelson, 1967). Mendelson and White (1982) reported that self-esteem and relative weight were significant predictors of body esteem, but only body esteem was

correlated with relative weight. Factor analysis of Mendelson's and White's (1985) body-esteem scale yielded three factors: body-esteem-appearance ("I'm pretty happy about the way I look") body-esteem-weight, (I wish I were thinner) and body-esteem-attributions ("Other people make fun of the way I look"). It seems that body-esteem, like self-esteem, is multi-dimensional. Mendelson, White, and Mendelson (1992) reported that body-esteem-appearance and body-esteem-attributions were significant predictors of Harter's global self-worth, but body-esteem weight was not. In their sample of children aged 7 to 16 low self-esteem was associated with negative feelings about one's appearance but was not associated with relative weight or with negative feelings about one's weight. Similarly, Rosen, Gross, and Vara (1987) reported that self-esteem was associated with body dissatisfaction, which in turn was associated with both deviation from average weight and deviation from desired weight for girls, although weight deviations were not related to self-esteem.

Of interest in the latter study is the finding that deviations from desired weight were noted for girls of normal weight, as well as overweight. Other investigators have reported that negative body image is a strong predictor of eating behaviour among normal weight adolescent girls (Attie & Brooks-Gunn, 1989). It seems that overweight adolescents might have poorer appearance esteem than normal weight adolescents, but the latter group is not immune to poor appearance esteem, nor are they immune to psychological or behavioral correlates.

Our cultural proscriptions against obesity along with media influences promoting dieting and thinness convey the idea that to be overweight is to be unattractive, undesirable and weak, especially for women. Moreover, dieting is a highly valued activity in North America and is the nucleus of a multi-billion dollar industry. The ideal female body is portrayed as lean and slender to a degree which may be unattainable by many adolescent girls. As girls develop they begin to depart from the culturally held ideal body whereas boys, who generally increase height and muscle mass during adolescence, move closer to society's concept of an appropriate male physique. Of course, failure to meet society's standards for a man's body may have negative sequelae for underweight and overweight boys, although this has not been studied in detail. It seems that at least moderate overweight is not as severely stigmatized for males as it is for females who are also judged to be overweight at lower relative weight levels than boys (White, Schliecker, & Dayan, 1991). In a culture which highly values thinness for women and muscularity for men, it seems that concern with physique is inherent in normal adolescent development.

Few studies which evaluate the general self-esteem and appearance esteem for a large sample of adolescents of varying weights have been published. One of the goals of the present investigation is to examine the global self-worth and appearance esteem of boys and girls at different weight levels. In a recent paper, Friedman and Brownell (1995) reported the results of a meta-analysis of research on the psychological correlates of obesity. They

noted that, in addition to inconsistent results, when weight-related deficits in self-esteem were reported, the effect size tended to be small. The cultural value placed on thinness combined with the developmental challenges of adolescence leads one to expect self-esteem deficits, yet empirical support does not yet warrant such a conclusion. In the present investigation, it is expected that overweight adolescents will report deficits in appearance esteem, relative to lower weight groups. No predictions are made regarding self-esteem and weight category

Developmental theorists have noted that bodily changes at puberty have important implications for overall self-perceptions (e.g.: Erikson, 1968; McCandless, 1970; Schonfield, 1969). It may be that girls are particularly troubled by pubertal physical development because of the increased distribution of fat which occurs (Brooks-Gunn, 1989; Silberstein & Striegel-Moore, 1984). In a culture which abhors fat it seems that any increase in fat distribution, however normal it may be, is unwelcome. Weight related gender differences in body satisfaction and dieting behaviour have been reported in the literature, as will be discussed in the next section.

Dietary Restraint and Disinhibited Eating

Dieting and restrained eating have received considerable attention from researchers over the past decade. A theory of restraint has been proposed which has contributed to our understanding of human eating behaviour and has stimulated research testing numerous hypotheses about the causes and

consequences of chronic restraint (Herman & Mack, 1975; Herman & Polivy, 1980). Briefly stated, according to restraint theory, the cognitive controls necessary to suppress eating will fail in the presence of dietary disinhibitors due to psychological and physical deprivation - the failure manifested by overeating. In other words, restrained eating (or dieting) causes overeating. According to this viewpoint, restraint and disinhibition are inherently linked; i.e., disinhibition is part of restraint. Herman and his colleagues quantified the concept of restraint with the development of the widely used 10-item Restraint Scale (RS) (Herman & Polivy, 1980).

In support of restraint theory, the paradoxical phenomenon of 'counter-regulation' has been observed in many laboratory studies of restrained eating. That is, restrained eaters consumed more food following a preload of food than did unrestrained eaters. A similar effect has been found for various other disinhibitors such as ingestion of alcohol, dysphoric emotions, depression and anxiety (Herman & Mack, 1975; Herman & Polivy, 1975, 1980; Hibscher & Herman, 1977; Ruderman & Christensen, 1983; Ruderman & Wilson, 1979; Polivy & Herman, 1976; Zielinski, 1978). The cognitive processes involved in restrained eating were demonstrated when the disinhibitory effect was shown even if restrained subjects only believed they had consumed a high calorie item. Actual caloric content did not influence their eating (Spencer & Fremouw, 1979; Polivy & Herman, 1976; Woody, Costanzo, Liefer, & Conger, 1981). Interestingly, the demonstration of disinhibition among high restrainers was

limited to normal weight subjects for the most part. In general, restrained obese subjects failed to eat more following a preload and in at least one study the restrained obese subjects actually ate less (Hibscher & Herman, 1977; Ruderman & Christensen, 1983; Ruderman & Wilson, 1979; Spencer & Fremouw, 1979). The latter results raised issues regarding the measurement and conceptualization of restraint.

The failure of the Restraint Scale to predict the eating behaviour of obese persons and high within-group variability of counter-regulated eating, led to examination of the scale's psychometric properties by several researchers. One of the confounding effects of the Restraint Scale seems to be inclusion of items reflecting weight fluctuation. Factor analytic studies have identified at least two factors within the Restraint Scale, Concern with Dieting (CD) and Weight Fluctuation (WF) (Blanchard & Frost, 1983; Drewnowski, Riskey, & Desor, 1982a, 1982b; Ruderman, 1983). Drewnowski, Riskey, and Desor (1982a) demonstrated that the scales' weight fluctuation items explained a large proportion of the variance in the high correlation between restraint and weight. It has also been shown that the larger the proportion of overweight individuals in a study the greater the number of factors that are generated and the lower the internal consistency of the Restraint Scale (Johnson, Lake, & Mahan, 1983 ; Ruderman, 1983). As Ruderman (1986) noted, a high score on the Restraint Scale for normal weight subjects generally means a high degree of concern with

dieting while the same score for overweight subjects does not necessarily mean the same thing.

Other measures of restrained eating have been developed which address some of the issues related to the Restraint Scale. Stunkard and Messick (1985) constructed the Three-Factor Eating Questionnaire (TFEQ) from factor analytic studies of 67 items from three sources; the Restraint Scale (Herman & Polivy, 1980), a German measure of latent obesity (Pudel, Metzdorff, & Oetting, 1975; cited in Stunkard & Messick, 1985) and items based on the author's clinical experience. The initial subjects were drawn from sources which would be likely to generate a wide range of restraint scores and body weights. The final form of the TFEQ contains 51 items measuring three dimensions of eating behaviour; Cognitive Restraint (TFEQ-CR), Disinhibition (TFEQ-D) and Perceived Hunger (TFEQ-PH).

TFEQ-CR items reflect not only concern for dieting, but also behavioral strategies to control weight. In contrast, the Restraint Scale (Herman & Polivy, 1985) includes only one item actually reflecting dieting behaviour, the remaining items assessing weight fluctuation and concern with dieting.

Disinhibition items of the TFEQ-D tap emotional and contextual eating, reflecting general tendencies to eat to cues other than hunger. Although the factor is labelled <u>dis</u>inhibition, prior inhibition of eating is not necessary in order to obtain high scores. The TFEQ-H, or perceived hunger factor, reflects susceptibility to the <u>perception</u> of hunger. It is not a measure of

satiety/deprivation however. High scores can best be described as the attribution of food consumption to hunger cues.

The separate measurement of restraint and disinhibition in the TFEQ is a major departure from the Restraint Scale (Stunkard & Messick, 1985). The Restraint Scale taps restraint/lapse of restraint as a single construct based on the assumptions of restraint theory. The original concept of dietary restraint has been described as a "multifaceted syndrome involving both a propensity to restrict food intake as well as a tendency to splurge" (Heatherton, Herman, Polivy, King, & McGree, 1988). Polivy and Herman (1989) acknowledge that their scale may be "misnamed in that it measures a combination of restriction and disinhibition" (p. 341). The Dutch Eating Behaviour Questionnaire (DEBQ) (van Strien, Frijters, Bergers, & Defares, 1986) is another increasingly used measure of eating behaviour. It too measures restraint and disinhibition separately, although the latter is assessed by two scales - emotional eating and contextual eating. At least one validity study has identified the TFEQ-R and the DEBQ-R scales as being conceptually related (Laessle, Tuschl, Kotthaus and Pirke, 1989).

High dietary restraint as assessed by questionnaires, has been demonstrated in children as young as 12 years of age. In two studies of more than 1,100 English school children, aged 12 to 18 years, DEBQ-Restraint scores were correlated with obesity for boys and girls, although sex differences with weight satisfaction were reported (Wardle & Beales, 1986; Wardle & Marsland,

1990). Lower weight girls were concerned with weighing too much, or being too large, and lower weight boys were concerned with being too small. Among overweight youngsters, both boys and girls wanted to be slimmer. It seems that restraint is related to overweight for boys but not for girls. On the basis of past research, one would expect to find that girls restrain their eating more than boys and that overweight boys restrain their eating significantly more than boys of lower weights. It is not clear if overweight girls will restrain their eating more than lower weight girls.

Both dieting and disinhibited eating have been tentatively linked to self-esteem. Post and Crowther (1985) reported that high school girls who met the criteria for bulimia nervosa were obsessively preoccupied with food, and had lower general self-esteem, were more dissatisfied with their bodies and dieted more than a matched control group who did not have bulimia. In a study of binge eating among obese adolescent girls, Berkowitz, Stunkard, and Stallings (1993) reported that the TFEQ-D scale was a significant predictor of the severity of binge eating, as was the happiness and satisfaction subscale of the Piers-Harris Self Concept Scale. Of note, was the finding that obese bingers were no more likely to have dieted than were obese non-bingers, contrary to restraint theory and adult findings. These results suggest that dieting does not necessarily precede disinhibition, at least for obese adolescents. Although happiness and satisfaction were measured rather than general self-esteem, the results suggest that disinhibition is related to self-esteem in adolescence.

Rosen, Gross, and Vara (1985) found that adolescents who reported trying to change their weight status, either to gain or to lose weight, also reported lower self-esteem than adolescents who were not trying to control their weight, although weight status itself was not related to self-esteem.

Three factors assumed to be part of weight control are body weight, restrained eating and disinhibited eating. It is not clear what aspects of weight control are related to self-esteem, although it seems not to be overweight status but rather the attempt to self-regulate a physiological state not easily amendable to change. Interestingly, in DSM-IV (1994), low self-esteem is listed as an associated feature of bulimia nervosa in which severe disinhibition (binge eating) is predominant, thus it is reasonable to expect that high disinhibitors will have lower self-esteem than low disinhibitors. Moreover, the Rosen, Gross, and Vara (1985) results suggest that the attempted weight control associated with highly restrained eating is also likely to be associated with low self-esteem.

Other self-perceptions such as perceived stress and environmental factors such as family functioning have been linked to obesity and disordered eating, as will be discussed next.

Perceived stress

Stress is sometimes defined as the degree to which an individual finds the events in one's life to be unpredictable, uncontrollable and beyond one's ability to successfully cope (Cohen, 1978; Lazarus, 1966, 1977; Seligman, 1975). When understood from that perspective, perceived stress can be

conceptualized as a self-perception that may be related to self-efficacy and self-esteem. In one review of the literature, Ganley (1989) concluded that emotional eating is reported by about 75% of obese subjects in treatment for weight management. Moreover, more emotional eating is reported by obese than normal weight controls in nontreatment studies. Ganley (1989) argues that negative emotions such as anger, depression, boredom, anxiety and loneliness are often related to stressful periods of life. Numerous investigations have been reported in which emotional and stress induced eating was the focus.

In one study comparing obese and normal weight adult males, Slochower (1976) gave false heart-rate feedback to induce high or low arousal. For some subjects, an explanation was given for their state of arousal and for some subjects no information was given (the diffuse anxiety condition). Results indicated that overweight subjects ate more cashew nuts in the diffuse anxiety condition than in the labelled anxiety condition. In a similar laboratory study, Slochower and Kaplan (1980) replicated the findings of the earlier study. Slochower, Kaplan, and Mann (1981) examined the eating behaviour of college age women under the real-life stress of exams which had been described by the subjects as unpredictable and uncontrollable. Eating behaviour was measured again three weeks later. During the exam period, overweight subjects ate more candy than normal weight controls. Candy consumption did not differ significantly between obese and normal weight controls during the post-exam session. It should be noted here that in the latter three studies,

moderate obesity was defined as greater than 15% overweight, a percentage which is somewhat below that usually considered overweight (i.e., 20%) and considerably lower than that which is usually considered obese therefore causal implications are tenuous.

The studies cited above reported higher anxiety or stress-related eating among the overweight, but there is no suggestion that the overweight experience more stress than non-overweight. Simple obese/nonobese comparisons may be inadequate to understand the relation between stress and eating behaviour. Given that many overweight individuals are also restrained eaters, it is difficult to attribute outcome to weight status unless restraint is also measured.

Links to stress induced eating have been made in the adult, eating disorders literature. Among college-age women, exacerbation of disordered eating was related to perceived stress (Striegel-Moore, Silberstein, Frensch, & Rodin, 1989). Feelings of ineffectiveness are also frequently reported by individuals with eating disorders (Johnson & Maddi, 1986). Attie and Brooks-Gunn (1989) reported that among mid-adolescent normal weight girls compulsive eaters could be distinguished from non-compulsive eaters on the basis of negative body image and feelings of ineffectiveness. In laboratory studies stress has been linked to the desire to binge (Cattanach, Phil, Malley, & Rodin, 1988). It seems fairly clear that stress-induced eating is not solely the domain of the overweight population but rather those who are high on

disinhibited eating report higher stress than those who do not report disinhibited eating.

There is little reason to expect that overweight subjects in the current investigation will report higher perceived stress than lower weight subjects. However, based on the results reported by Slochower and her colleagues (Slochower, 1976; Slochower & Kaplan, 1980; Slochower, Kaplan, & Mann, 1981) it is expected that adolescents who report eating to cues other than hunger will report higher perceived stress.

How is it happening that children as young as 12 years of age are concerned with dieting? Certainly cultural and media influences play a large part in our obsession with thinness. In late childhood and pre-adolescence, it is likely that families are still the primary socializers of eating behaviour. Undoubtedly, parents' beliefs about a child's acceptability, including appearance, will play a role in the development of self-esteem. Pressure, or even encouragement, to reduce weight may be sending the message that the child is unacceptable as he/she is. In fact, Pike and Rodin (1991) reported that at least subclinical levels of disordered eating were more likely among adolescent girls whose mothers' were critical of their weight and physical appearance. Regardless of the etiology of obesity or disordered eating, the family may play a part in sustaining eating and weight-related concepts of the self.

Family Functioning and Perceived Social Support/Regard

Considerable importance has been attached to family variables by clinicians interested in eating behaviour and obesity yet there is surprisingly little research on the family as it relates to eating and weight-related concerns of obese adolescents. There is no dearth of theories as to relevant features of the family which may relate to eating behaviour and obesity. Hilda Bruch (1973) suggested that the "aggressive dissatisfaction" of parents with their child (p . 147) is the determining factor in the poor self-concept of the obese children she saw in her clinic. As she quotes from one adolescent girl, "My parents love or reject me according to whether I'm thin or fat. They do not like ME" (Bruch, 1973, p. 162). The mothers she saw tended to be over involved with their children thereby, she believed, undermining the development of autonomous functioning in general. Bruch (1973) also stated that by taking over the reducing regimes of their children specific deficits in controlled eating are developed and maintained. Consistent with Bruch's ideas, Woody (1986) and Woody and Costanzo (1981) argued that the socialization of eating behaviour by parents is a contributing factor in the development and maintenance of obesity prone behaviour. They theorized that by exerting external control of their children's eating and weight management, children fail to develop self-directed regulatory controls over eating. Controls become "brittle" and may signal the beginning of a diet/binge cycle, or weight loss/gain spiral that will continue throughout life. Minuchin, Rosman, and Baker (1978) described

psychosomatic families, including families with obese children, as enmeshed, rigid, overprotective, and lacking in conflict resolution skills. Other family characteristics hypothesized to distinguish obese families include the avoidance of conflict resolution (Ganley, 1986), and poor communication skills (Hecker, Martin, & Martin, 1986). Similar tendencies have been reported in the families of individuals with eating disorders (Attie & Brooks-Gunn, 1989; Minuchin, Rosman, & Baker, 1978; Schwartz, Barret, & Saba, 1984).

Differential treatment of boys and girls in families with an obese child have also been noted. Costanzo and Woody (1984) observed that parents of girls were more likely to attribute obesity to emotional sensitivity and lack of self control and parents of boys attributed obesity to a problem of energy-balance. In families of boys, obesity seems to be viewed as a management or behavioral problem. Girls' weight problems are more likely to be seen as internal problems of personality and emotionality. When viewed from the perspective of self-deficit by their families, the obesity of girls may be more likely to have negative psychological sequelae.

A few empirical studies have provided us with data regarding the functioning of families with an obese child. Consistent with Costanzo's and Woody's (1984) ideas about sex-typed socialization of obesity prone behaviour, Kinston, Miller, Loader, and Wolff (1990) observed qualitative differences in the interactions between parents of obese girls and those of obese boys. The results of their Home Interview Assessment (Kinston & Loader, 1984, 1986)

indicated that parents of obese girls were antagonistic toward their daughters, interacted negatively with them on matters related to obesity and blamed them for being obese. The tone of interactions between parents and their obese sons was more positive than with daughters, even on issues of weight management. No systematic sex differences were found in the families of non-obese boys and girls in matters related to food.

Beck and Terry (1985) administered the Family Environment Scale (Moos & Moos, 1981) to eight families with an obese child and eight families with a normal weight child, aged 8 to 12 years. The families of obese children were described as less cohesive, more conflicted, less interested in social and cultural activities and less organized than the normal weight families. Banis, et al. (1988) used the same measure in a larger sample of families with obese children. They found less cohesion among the obese families in comparison to normative samples. In addition, compared to normative samples, their families were less independent, and had less of an active/recreational orientation.

A variety of methods have been used to examine different family variables with respect to eating behaviour and obesity. Methodological problems with many of the family functioning studies, such as failure to use adequate control samples and small sample sizes demand cautious interpretation. Moreover, inconsistencies with respect to the measures used and the nature of family difficulties make it difficult to define or identify those features of the family which are impaired in obese or eating disordered families. Despite the different

methods and foci, it seems fairly clear that family difficulties are associated with obesity, especially for girls, thus it is likely that overweight girls will report more family pathology than will lower weight girls.

Negative family interactions and poor family functioning are not exclusive to obesity or eating disorders, however. Authoritarian and rejecting parenting seems to be related low self-esteem in childhood regardless of weight status (Bachman, 1982; Coopersmith, 1967; Loeb, Horst, & Horton, 1980). Since the negative interactions with obese children seem to centre around eating behaviour in a very personal and conflicted way for girls, it seems reasonable to expect that one way girls may try to improve family relations is by restraining their eating. Thus, girls who are high on restrained eating will report more family pathology than girls who do not restrain their eating.

Implicit in the measurement of family functioning, is the idea that the family unit differs in some important way from dyadic relationships within the family. Knowledge about the relationships with parents and others in the adolescent's social environment may provide information about adolescents' self-perceptions beyond that provided by knowledge about how the family functions as a unit. Interpersonal relationships with peers have an important function in the well-being of adolescents. As will be discussed next section, the construct of perceived social support provides a framework suitable for further examination of the relations between obesity, self-perceptions and eating behaviour.

The relationship between social support and weight related issues has been confined mostly to the literature on treatment of obesity. There is evidence that individuals living in socially supportive environments are more successful in weight loss programs both initially and at long-term follow-up (Mahoney & Mahoney, 1976; Miller & Sims, 1981; see also Colletti & Brownell, 1982 for a review of the treatment literature).

There are many ways of conceptualizing and measuring social support. One often reported conceptualization is that of perceived social support (PSS). Early social support theorists (eg. Cobb, 1976) envisioned the role of social support as providing information to the individual that s/he is cared for and accepted in one's social milieu. Similarly, Cassel (1976) believed that positive feedback from the social environment was more instrumental in bringing about positive results than was any actual supportive behaviour. In a series of studies comparing social support measures it was found that the degree to which the respondent felt valued and accepted are common to most measures, in varying degrees, regardless of the focus of the measure or its underlying conceptualization (Sarason, Shearin, Pierce, & Sarason, 1987). Authors from different disciplines and orientations acknowledge the importance of the relationship between the physical self, self-esteem and the interpersonal and cultural environment. Sociologists such as Cooley (1902) and Mead (1934) emphasized the impact others have on our appraisals of ourselves. In a similar vein, the psychoanalytic concept of internalization overlaps the development of

self-esteem. "... to some extent and within limits people ... continuously redefine what is moral and estimable about themselves in terms of what the environment appears to recognize, accept and reward." (Schafer, 1968; p. 157). If PSS reflects an individual's sense of acceptance, as at least one group argues (Sarason, Pierce, & Sarason, 1990), then its inclusion in a study on self-perceptions and regulation of eating seems appropriate.

The adolescent stage of development is one in which peers assume great importance in identity development. There is ample theoretical support for studying the role of peer relationships in adolescent self-esteem (eg., Blos, 1962; Erikson, 1968; Sullivan, 1954). Despite the increasing influence of peers in adolescence, however, the role of parents remains significant. Several studies have found strong relationships between support from parents and friends and adolescent self-esteem (Burke & Weir, 1979; Greenberg, Siegel, & Leitch, 1983; Siddique & D'Arcy, 1984). One correlational study suggested that feelings toward parents were more strongly related to self-esteem than were feelings toward peers for grade 8 students. By grade 11, the discrepancy had narrowed somewhat, with relationships for both parents and peers being similar in magnitude (O'Donnell, 1976).

Despite the different methodologies and conceptualizations of social support, the empirical evidence for the importance of parents and peers to adolescent self-esteem is compelling. Although social support/regard has not been investigated as a function of obesity or disordered eating, it seems worthy

of exploration given the importance of dyadic and peer group relationships in adolescence. It may be that the perception of adequate social support from one's social milieu is related to less restrained and disinhibited eating.

Statement of Purpose

The purpose of the present work is to investigate the self-perceptions, eating behaviour and interpersonal environments of a large group of adolescent boys and girls, across a wide range of body weights, unselected for eating disorders or obesity. The popular literature, supported by clinical impressions, suggest that overweight adolescents suffer self-perception and social environment deficits compared to lower weight adolescents. Empirical support, however, has been less consistent with regard to overweight deficits in psychosocial well-being. There is, however, some empirical support for the idea that restrained and disinhibited eating are associated with problems in psychosocial well-being in adolescence.

One goal of the current investigation is to examine the way in which weight and eating behaviour are related to psychosocial well-being for boys and girls. Based on previous literature (eg., Wardle & Beales, 1986; Wardle & Marsland, 1990) it is proposed that two different patterns of eating regulation, in relation to psychosocial well-being, will emerge for boys and girls. Specifically, it is likely that BMI will be a significant component of eating regulation in the prediction of psychosocial well-being for boys, but not for girls. Because the

question of gender differences in the relation between eating regulation and psychosocial well-being is exploratory, no other hypotheses have been generated with respect to this first aim of the study.

The second and third aims of this study are to examine self-perceptions, the social environment and eating behaviour as a function of adolescents' weight status, restraint status and disinhibition status.

Weight Group and Self-perceptions

Girls, and adolescents who are overweight will likely have lower appearance esteem than will those in other weight groups. Further, the work of Wardle and Beales (1986) and Wardles and Marsland (1990) suggests that underweight boys will have lower appearance esteem than boys in higher weight categories. Theoretical considerations of global self-worth as a domain-free construct and the equivocal results in the empirical literature preclude hypotheses with regards to weight-related decrements in global self-worth. Regarding perceived stress, the examination of weight-group differences is exploratory and no specific hypothesis will be tested.

Weight Group and the Social Environment

There is clinical support for the idea that general family functioning (eg., Minuchin, Rosman, & Baker, 1978) and relationships with parents (eg., Bruch, 1973) and peers (eg., Allon, 1979) suffer among adolescents who are overweight. Sex differences in families' attitudes toward obesity (eg., Costanzo & Woody, 1984) suggest that overweight girls will report more family

dysfunction than will lower weight girls. No specific hypotheses will be tested regarding the family functioning of overweight boys. The examination of perceived social support/regard is exploratory in this investigation, thus no specific hypotheses will be tested.

Weight Group and Eating Regulation

Research on restrained eating and/or dieting behaviour and disinhibited eating suggests a relationship between regulation of eating and weight status. It is expected that girls will report higher restraint scores than boys, and overweight adolescents will report more restraint than normal weight adolescents. The relation between overweight status and disinhibited eating has been well established, especially within the adult population. Although there is less research with adolescent populations, indications are that overweight adolescents will report more disinhibited eating than adolescents of lower weight status (eg., Slochower and colleagues, 1986, 1980, 1981).

Restraint, Disinhibition and Psychosocial Well-being

The third goal of the present work is to examine possible psychosocial concomitants of highly restrained and disinhibited eating, regardless of weight status. Restraint theory suggests that highly restrained eaters will also be highly disinhibited eaters. Also, there is some evidence suggesting that teenagers who try to change their weight status have lower self-esteem than those who do not. On the basis of Rosen, Gross, and Vara's (1985) work, one would expect

highly restrained adolescents to report lower self-esteem, and lower appearance esteem, than adolescents who do not restrain their eating.

Similarly, previous work makes reasonable the assumption that highly disinhibited adolescents will have lower global self-worth scores than adolescents who do not report disinhibited eating (eg., Berkowtiz, Stunkard, & Stallings, 1993). Moreover, since stress and coping have been linked to disinhibited eating, it is expected that high disinhibitors will report higher perceived stress than low disinhibitors (eg , Slochower and her colleagues, 1976, 1980, 1981).

With regard to the social environment, there is sufficient evidence to suggest that various types of family dysfunction are associated with eating disordered tendencies among women. Although few studies have been reported examining the relationship between restraint, disinhibition and family functioning among adolescents, the work of Kinston and Loader (1984, 1986) and Kinston, Miller, Loader, and Wolff (1990) suggests that girls who report highly restrained eating will report poorer family functioning than girls who are low on restraint. Examination of perceived social support/regard as a function of restrained or disinhibited eating is exploratory and no specific hypotheses will be generated.

Method

Subjects

Boys and girls in grades 9, 10 and 11 from three English-sector public high schools in the Montreal area participated in this study. The schools serve ethnically diverse lower to upper-middle class communities. Data were collected from 587 adolescents. Data from some participants were excluded from analysis due to incomplete questionnaires (n = 50), the presence of weight-related metabolic dysfunction (n = 2), insufficient height and weight to be recorded on charts for adolescents (n = 2) and parental request for subject to be withdrawn (n = 1). Complete data are available for 532 adolescents (279 males; 253 females) ranging in age from 13 to 18 years ($\underline{M}$ = 15.72, $\underline{SD}$ = 1.04). In two of the schools, 90% of the grade 9, 10 and 11 students who were present that day participated in the study. In the third school, 50% of the students in grades 9, 10 and 11 were available for testing and 70% of those students participated in the study.

The majority of subjects (88%) lived in two-parent households (n = 430), 75 lived with mother only and 15 lived with father only. Twelve subjects reported other arrangements, such as living with an older sibling or grandparents.

Materials

Adolescents participating in this project were asked to provide brief demographic information (Appendix A) and complete a set of five

questionnaires. (The complete adolescent package is shown in Appendices A through F). Following is a description of the measures used in this study.

Perceived Social/Support Regard

The Social Support Scale for Children, People in My Life (Harter, 1985) was adapted for use with adolescents in this study. (See Appendix B.) This measure was designed to assess the perception of available social support from four potential sources, parents, classmates, teachers and close friends. Each scale taps the degree to which the respondent reports feeling cared for, and held in regard by, significant others in his/her life. The scales each have six items with four possible choices per item: whether the teen on the negative or positive side is most like the respondent and to what degree, a lot or a little. An example from the Parent scale is "Some teens have parents who don't really understand them BUT Other teens have parents who really do understand them". Each item is scored from 1 (low perceived support/regard) to 4 (high perceived support/regard). Scale scores are based on the average endorsement per item for each scale, thus scores can range from 1 to 4.

In order to adapt the scale for use with adolescents, the word "teens" was substituted for "children" in each question and some items were reworded to reflect teenage activities and concerns. For example, the item "Some children do not have a close friend who they like to play with" was changed to "Some teens do not have a close friend who they like to spend time with".

Harter (1985) reports internal consistency ranging from .72 to .88 with her initial samples of children in grades 3 through 8. In support of the validity of the scale Harter (1986) reports moderate correlations between the social support scales and global self-worth as well as between the social support scales and the socially-oriented children's self-competence scales.

Internal reliability analyses on the adapted measure with this sample was satisfactory as evidenced by Cronbach's alpha for the parent, classmate, teacher and friend scales: .87, .72, .79, and .90, respectively. Subscale inter-correlations for the adapted measure used with the current sample range from .20 to .53, similar to the correlation pattern reported by Harter (1986). Correlations between the subscales and global self-worth on Harter's middle school sample (grades 6, 7 and 8) range from .28 to .49. In the current sample of adolescents in grades 9, 10 and 11 the adapted subscale inter-correlations with global self-worth range from .22 to .44.

The means and standard deviations of each of the four social support subscales for Harter's grade 8 samples are shown in Table 1 along with the means and standard deviations for the adapted subscales used with the current sample from grades 9, 10 and 11. As can be seen in the table, the current sample's responses are similar to those reported by Harter (1986) on her original measure. Harter (1986) noted a decline in reported teacher support/regard from grade 3 to grade 8. She also noted an age related trend whereby the means of the peer scales moved closer to the means of the parent

Table 1

Perceived social support/regard: adapted measure used with current sample and Harter's original sample

	Current Sample		Harter's Sample	
	M	SD	M	SD
Parent support				
Boys	3.21	.61	3.20	.58
Girls	3.12	.77	3.23	.72
Classmate support				
Boys	3.17	.49	3.05	.50
Girls	3.30	.46	3.20	.57
Teacher support				
Boys	2.63	.64	3.08	.64
Girls	2.77	.62	3.42	.68
Friend support				
Boys	3.30	.68	2.87	.58
Girls	3.64	.54	3.16	.72

scales. Differences in means between Harter's early adolescent scale and the adapted scale used with older adolescents may reflect a continuation of those trends.

Self-esteem/Appearance Esteem

Two scales from The Self Perception Profile for Adolescents (Harter, 1988) were used to assess physical appearance esteem and global self-worth. (See Appendix C.) The physical appearance esteem scale includes items such as "Some teenagers are not happy with the way they look BUT Other teenagers are happy with the way they look". An example of a global self-worth item is "Some teenagers are often disappointed with themselves BUT other teenagers are pretty pleased with themselves". Each scale contains five items with format and scoring identical to that of the perceived support/regard scales. These scales have been widely used and reliability and validity have been well established. Harter (1988) reports correlations between appearance esteem and global self-worth ranging from .66 to .71 on three separate samples of adolescents in grades 8 to 11. Although the correlations are moderately high, Harter (1988) reports factor analytic studies which indicated a replicable pattern of distinct factors suggesting differentiated scales. For the current sample, the correlation between global self-worth and appearance esteem is .60 for boys and .71 for girls. The means and standard deviations of global self-worth for boys (M = 3.05, SD = .58) and girls (M = 2.81, SD = .76) and appearance esteem for boys (M = 2.72, SD .68) and girls (M = 2.35, SD = .76) in the

current sample are similar to those reported by Harter (1988) for her validation samples of boys and girls in grades 9, 10 and 11.

Perceived Stress

The Perceived Stress Scale (PS) (Cohen, Kamarck, & Mermelstein, 1983) measures the degree to which events in the past month are perceived as stressful, unpredictable and beyond ones' resources to cope. (See Appendix D.) The PS consists of 14 items rated on a 5-point scale from 0 (never) to 4 (very often), thus scores can range from 0 to 56. The questions are designed to measure nonspecific appraised stress. For example, "In the last month, how often have you felt that you were unable to control the important things in your life?". The PS has good internal reliability. Convergent and predictive validity have been demonstrated by the PS's correlation with life-events scores, and with depressive and physiological symptomatology (Cohen, et al., 1983). Cohen, et al. (1983) report means and standard deviations of two college age samples to be 23.18 (7.31) and 23.67 (7.79) and of a sample taking part in a smoking cessation program (25.00 (SD 8.00)). Balfour, White, Schiffrin, Dougherty, and Dufresne (1993) reported mean perceived stress score of 22.6 (8.3) for a sample of diabetic women aged 12 to 26 years. The mean for the current adolescent sample is somewhat higher (M = 26.03, SD = 7.19) although the difference is unlikely to be clinically significant. The mean is near the middle of the scale rather than near the ceiling, thus the current sample does not seem to be unduly stressed compared to other samples.

Family Functioning

The Self-Report Measures of Family Functioning (Bloom, 1985; Bloom & Lipetz, 1987) is a 60 item measure assessing 15 dimensions of the family. The scales were generated from non-overlapping items on four well-known, widely used, family assessment scales. Bloom (1985) reports convergent and predictive validity and acceptable reliability. The scales are moderately correlated with other measures of family function and they differentiate intact and disrupted families (Bloom, 1985).

A 45 item version assessing nine family dimensions were used in this study. (See Appendix E.) Five scales assess relationship dimensions of family functioning (cohesion, expressiveness, conflict, family idealization and disengagement) and four scales assess system maintenance dimensions of the family (enmeshed, democratic, permissive and authoritarian family styles). Each scale consists of five items scored on a four-point scale, thus scale scores can range from 5 (very untrue for my family) to 25 (very true for my family). In the current investigation, reliability analysis of the adolescent data for the SRMFF revealed Cronbach's alpha of less than .60 for the enmeshment scale (alpha = .46) and for the permissive scale (alpha = .43). As a result, these scales were excluded from further analysis. Cronbach's alpha ranged from .60 to .90 on SRMFF scales retained for analysis. Scale inter-correlations ranged from .21 to .72, similar to those reported by Bloom (1985). The means and standard

deviations for the current sample, shown in Table 2, were virtually the same as those reported by Bloom (1985) for a college-age sample.

Self-report of Eating Behaviour

The Three Factor Eating Questionnaire (Stunkard & Messick, 1985) adapted for use with children (Isbitsky, 1987) was used to assess self-reported cognitive restraint of eating, dietary disinhibition and perceived hunger. (See Appendix F.) Cognitive dietary restraint refers to concern with body weight and motivation to control eating. An example of a restraint item is "I consciously hold back at meals in order not to gain weight" (True/False). There are 21 restraint items, scored 0 or 1 indicating the presence or absence of restraint on that item, thus scores can range from 0 to 21. Dietary disinhibition refers to the propensity to eat in response to contextual, social or emotional cues rather than to hunger cues. A disinhibition item is "I usually eat too much at social occasions, like parties or picnics" (True/False). The disinhibition scale has 16 items with possible scores ranging from 0 to 16. The hunger scale represents eating in response to the perception of hunger such as "At certain time of the day I get hungry because I have gotten used to eating then" (True/False). There are 14 hunger items with possible scores ranging from 0 to 14. Criterion and predictive validity of the TFEQ have been established (Ganley, cited in Stunkard & Messick, 1985; Marcus & Wing, cited in Stunkard & Messick, 1985). High test-retest reliability has been reported at one-month for adults (Ganley, cited in Stunkard & Messick, 1985) and at one week for children (Isbitsky,

Table 2

Means and standard deviations, Self-report Measures of Family Functioning

	Boys		Girls	
	M	SD	M	SD
Cohesion	15.51	3.33	15.47	3.40
Expressiveness	13.78	3.50	14.11	3.73
Conflict	11.00	3.00	12.10	3.26
Family idealization	12.99	3.46	12.37	3.70
Disengagement	10.82	2.90	10.74	2.75
Democratic style	14.00	3.20	13.93	3.56
Authoritarian style	11.38	2.73	12.00	2.85

1987). Cronbach's alpha for children aged 7 to 13 years ranged from .67 to .74 (Isbitsky, 1987). For the present sample of adolescents, Cronbach's alpha was .87 for restraint, .66 for disinhibition and .70 for hunger. The correlations between disinhibition and perceived hunger (r = .51) and restraint and perceived hunger (r = -.13) are similar to those reported by Stunkard and Messick (1985) for their adult sample of men and women. Stunkard and Messick (1985) report a correlation of .43 between the disinhibition and restraint scales. It should be noted however, that their sample was comprised of more than 90% women. For the current sample of boys and girls combined, a correlation of .19 was found between the restraint and disinhibition scales. However, examination the correlations between restraint and disinhibition separately for boys and girls reveals a significant relationship for girls (r = .34), similar to that reported by Stunkard and Messick (1985). The correlation between restraint and disinhibition was not significant for boys in the current sample (r = .01).

Height and Weight Measurement

Weight and height were measured fully clothed, with shoes on. Each subject was weighed on a Sunbeam, electronic scale with digital read-out and standard wall-height measurements were taken. If the subject disputed either the height or weight measure, it was re-done to ensure accuracy. No adjustments for weight were necessary following a second weighing. An

adjustment in height was made following the second measurement for approximately 1% of the subjects.

At the beginning of the investigation and several times during data collection, three research assistants, two normal weight and one overweight, compared their weight recorded by the scale used in the study with that obtained on a standard balance-beam scale. Weights taken on the two scales never disagreed by more than +/- 1 pound.

Subjects represented a wide range of weight status from very underweight to moderately obese. Body mass index (BMI), a weight/height ratio (kg./metres^2) ranged from 12.5 to 38.6 (M = 22.08, SD = 3.52). BMI is used increasingly as a measure of nutritional status in eating disorders literature (Steiger, Puentes-Neuman, & Leung, 1991) and as an indirect measure of adiposity in the obesity literature (Hammer, Kraemer, Wilson, Ritter, & Dornbusch, 1991).

Procedure

School Participation

Letters describing the study and copies of the questionnaires were sent to the research administrators of three school boards who then made contact with schools in their sector. (See Appendix G.) The three schools which participated were chosen based on availability and agreement by each of the principals. Individual principals were then contacted and meetings were held

with representatives of the teachers in each school in order to explain the procedure and enlist their cooperation.

Adolescent Participation

Two to three weeks prior to testing 15 minute information sessions were presented in each class describing the purpose and method of the study. (See Appendix H.) Students were told that we were trying to question as many teenagers as possible about their relationships with families and peers as well as about their dieting habits. It was explained that in order to provide help for teenagers who request it, it was important that we know how as many teens as possible think and feel about these issues. Examples of the type of questions that could be expected were presented and confidentiality was assured. At that time the students were given information letters and consent forms for parents to sign and return to the school. Incentives to participate in the study were offered in each school. In two of the schools each student who completed the study was eligible to win one of ten $20 movie gift certificates. In the third school, where raffles were prohibited, each participant was paid $7.00.

Data Collection

Data collection took place 2 to 3 weeks following the information sessions. Because the return rate for consent forms was about 10%, enough questionnaires were brought for each student and they were given the option of signing consent forms at that time if they wished to participate. In two schools testing took place in individual classrooms in lieu of a regularly scheduled 50

minute class in personal and social development. Because this is a required course each student in the school was given the chance to participate. School regulations stipulated that all students remain in the room during the class period. Students who did not wish to complete the questionnaires were told they could work quietly on their own. Approximately 90% of the students participated. Refusal did not appear to be systematically related to weight status or gender.

In the third school, group testing was done in the library over the course of one day. Students were given the option of taking part in the study instead of attending a regularly scheduled physical education class. One-half of the students in the school were scheduled for Physical Education class on the day of testing and 70% of eligible students participated in the study. Because students who enjoy physical education may have been less likely to participate in the study some selection bias may have been present. A one-way analysis of variance with school as the grouping factor revealed no differences in BMI across schools, thus it seems unlikely that any selection bias was weight-related.

At the beginning of the test session subjects were given a set of questionnaires to complete. Two research assistants circulated the room during the testing in order to answer questions and to ensure that questionnaires were correctly completed. Some errors were noted and corrected, particularly in the Harter scales, on which there was a tendency to

check two boxes per question, one on the "like me" side and one on the "not like me side". If more than one or two students in a class were observed to make that error, a research assistant interrupted the testing and explained the procedure again.

As each student finished she/he was directed to the back of the room where height and weight were measured. Care was taken that privacy was ensured and that no other student could see the measurements.

Data Reduction and Group Classification

The variables considered here can be grouped into four types: structural (school, age, sex), self perceptions (global self-worth, appearance esteem, perceived stress), relational (family functioning, social support) and eating behaviour/regulation (BMI, dietary restraint, disinhibition, perceived hunger). Each of the variables in these four sets was examined for missing values and fit between their distributions and the assumptions of univariate and multivariate analyses. No univariate or multivariate outliers were found for any of the variables. Because no differences were noted as a function of school or age, data were collapsed across schools and age groups.

Data Reduction

Reduction of the number of variables generated by the family functioning scales seemed warranted for several reasons. The SRMFF addresses the distinction between various aspects of family functioning which may not correspond to the different measures used in previous research, thus making

cross study comparison difficult. Different methods and measuring instruments used in family research have emphasised different problematic aspects of family functioning with regards to eating behaviour and obesity. Less than optimal family functioning is a feature common across the literature. Finally, analysis of seven scales of family functioning may obscure interpretation rather than enhance it. With one exception, scale inter-correlations ranged from $\underline{r}$ =.33 to $\underline{r}$ = .72 indicating some overlap. The sole exception to the high correlations was the Authoritarian Family scale which was correlated less than .30 with each of the other scales. The inter-correlations are comparable to those reported by Bloom (1985). A Principal Components Analysis (PCA) with varimax rotation was performed on the seven SRMFF that were reliable for adolescents: cohesion, expressiveness, conflict, family idealization, disengagement, democratic and authoritarian family styles.

Two factors, Family Psychological Health (FPH) and Authoritarian Family Style (AFS) were extracted with eigenvalues greater than one accounting for 70% of the variance. The loadings for the rotated factor matrix are shown in Table 3. The first factor identifying the FPH dimension is comprised of high scores on cohesion, expressiveness, family idealization, and democratic styles with low scores on the conflict and disengagement scales. Authoritarian style failed to load on the first factor but loaded strongly on the second factor. The only other variable to load on the second factor was disengagement. Thus factor two consisted of high authoritarian scores with low disengagement

Table 3

Principal components analysis of Self-Report Measures of Family Functioning

	Rotated Factor Matrix	
	Factors	
	1	2
	(FPH)	(AFS)
Cohesion	.88*	.11
Expressiveness	.83*	-.09
Conflict	-.66*	.18
Family idealization	.84*	.00
Disengagement	-.68*	-.45
Democratic family style	.80*	-.23
Authoritarian family style	-.14	.92*

Note: * indicates variables interpreted to be associated with the factor

(FPH) = Family Psychological Health
(AFS) = Authoritarian Family Style

scores. Because the loading for disengagement was stronger on the first than on the second factor, and because Authoritarian style was clearly the variable more important to factor two, it was decided to retain disengagement on factor one and eliminate it from factor 2, the AFS dimension. A composite variable was created from the sums of the standardized variables which formed factor one as recommended by Comrey (1973). The composite, Family Psychological Health (FPH) and the Authoritarian Family Style scale (AFS) were used in all analyses.

Group Classification

Weight status. BMI was used to group subjects into the following weight categories: underweight (lowest 15% of the sample), low average (from 16th to 49th percentile), high average (50th to 85th percentile) and overweight (top 15% of the sample). Means, standard deviations and ranges of BMI for boys and girls in each weight category are shown in Table 4. It should be noted that although there is a wide range of weight among the adolescents participating in this study, none is considered to be morbidly obese by most standards. Generally the BMI cut-off for adult obesity is 27.2 for men and 26.9 for women (Hammer, Kraemer, Wilson, Ritter & Dornbusch, 1991). For adolescents aged 15 to 17, cut-offs of 24.3 for males and 24.8 for females have been suggested for overweight (Harlan, 1993). The cut-off for obesity was not specified. As can be seen in Table 4, the BMIs for overweight boys in this sample range from 25.66 to 38.58 and range from 24.71 to 35.41 for overweight girls. Regarding

Table 4

Means, standard deviations and ranges of BMI for boys and girls

	Boys	Girls
	M (SD) Range	M (SD) Range
Underweight	17.77 (1.25) 12.50-18.93 n=41	18.10 (.81) 16.03-18.99 n=30
Low average weight	20.23 (.87) 18.93-21.72 n=99	20.18 (.60) 19.00-20.12 n=87
High average weight	23.39 (1.07) 21.74-25.62 n=96	22.61 (1.06) 21.13-24.65 n=89
Overweight	29.05 (3.3) 25.66-38.58 n=43	27.54 (2.68) 24.71-38.41 n=38

the underweight classification, the cut-off for chronic energy deficiency in adults has been suggested as 18.5 (Hammer, et al. 1991). Steiger, et al. (1991) have suggested that BMI below 15 or 16 is emaciated for aged 14 to 18 years. Steiger, et al. (1991) reported mean BMI of 17.57 (1.4) for a large sample of high school girls identified as restricted eaters and mean BMI of 17.50 (1.08) for underweight bingers. The underweight classification in this sample ranges from BMI of 12.5 to 18.92 for boys (M = 17.77, SD = 1.25) and 16.03 to 18.99 (M = 18.10, SD = .81) for girls (refer to Table 4). Analysis of variance indicated significant Weight group differences on BMI ($F(3,528) = 787.41$, $p < .001$ and Tukey post hoc analysis confirmed that BMI was significantly higher in each successive weight group. Relative weight based on averages for age, height and sex were also calculated for this sample. The formula for calculating relative weight as well as the means, standard deviations and ranges of relative weight for boys and girls by BMI weight group classification are shown in Appendix I.

Disinhibition group. The disinhibition groups are comprised of participants in the top and bottom 15% of the sample on disinhibition. The low disinhibition group consists of 51 boys and 57 girls with disinhibition scores equal to or less than two. The high disinhibition group was formed by 53 boys and 54 girls with disinhibition scores equal to or above eight. The means and standard deviations of disinhibition scores for boys and girls in the low and high disinhibition groups are shown in Table 5. Although the chosen cut-off for the

Table 5

Means and standard deviations of disinhibition scores for boys and girls in the low and high disinhibition groups

	Disinhibition		
Groups	M	SD	N
Low Disinhibition Group	1.62	.59	108
Low disinhibition boys	1.71	.54	51
Low disinhibition girls	1.54	.62	57
High disinhibition Group	9.44	1.49	107
High disinhibition boys	9.55	1.60	53
High disinhibition girls	9.33	1.38	54

groupings was somewhat arbitrary, the values used permit a clear distinction between teens who do not report disinhibiting (those endorsing only one or two items) compared to teens who report relatively high disinhibition. The mean disinhibition scores of the boys and girls in the high disinhibition group are similar to those reported in the literature for adult women suffering from bulimia (e.g., Lowe & Kleifield, 1988; Westenhofer, 1991). The mean disinhibition scores in the low and high disinhibition groups are significantly different from one another ($F(1,213) = 2556.35$, $p < .001$).

Restraint groups. Low and high restraint groups were formed based on restraint scores at the 15th and 85th percentiles. The low restraint group consists of 85 boys and 42 girls with restraint scores less than or equal to two. The high restraint group consists of 45 boys with restraint scores greater than or equal to eight and 41 girls with restraint scores greater than or equal to 14. In order maintain consistency of the construct within gender, the percentile ranks for boys and girls separately were used to form the restraint groups even though this method resulted in higher mean restraint scores for girls than for boys. The means and standard deviations of the restraint scores by gender in the high and low restraint groups are shown in Table 6. The use of the 15th and 85th percentiles was an arbitrary choice although it is clear from examining the mean restraint scores of low and high restrainers that a distinction can be made between the two groups. Moreover, the mean restraint scores of the boys and girls in the high restraint group are similar to Stunkard's and

Table 6

Means and standard deviations of restraint scores for boys and girls in the low and high restraint groups

	Restraint		
Groups	M	SD	N
Low Restraint Group	1.46	.63	127
Low restraint boys	1.49	.61	85
Low restraint girls	1.38	.66	42
High Restraint Group	13.56	3.57	86
High restraint boys	10.84	2.31	45
High restraint girls	16.54	1.96	41

Messick's (1985) adult dieters, and higher than Balfour, et al (1994) diabetic adolescent and adult women, who perforce must restrain their eating. Finally, the mean restraint scores for the high and low restraint groups are significantly different from one another ($F(1,211) = 1396.34$, $p < .001$).

Results

The data analyses in this study proceeded in four parts. Part I is an exploratory analysis of the multivariate relation between eating behaviour and weight on the one hand, and self-perceptions, family environment and perceived social support/regard on the other for the entire sample of boys (N = 279) and girls (N = 253). Canonical correlation analysis was used to describe the samples. Specific hypotheses were not tested.

In Parts II, III and IV multivariate and univariate analyses of variance were used to examine group differences on self-perceptions, the social environment and eating behaviour as a function of Weight group (Part II), Restraint group (Part III) and Disinhibition group (Part IV). The assumptions of normality and homogeneity of variance for factorial ANOVA were verified (the ratio of largest to smallest group variance did not exceed 3:1 (Keppel, 1991)). In some groups a number of variables showed mild to moderate skewness, while other variables showed more extreme skewness. Skewness indicated, in general, good functioning on those variables. Data transformation corrected the skewness but did not affect results of the analyses, therefore, reports of analyses on original

scores are presented in the text. Because cell sizes were unequal and disproportionate, unweighted means analyses were used.

Significant ANOVA interactions were followed up with tests of main effects and significant main effects were followed-up with Tukey post hoc procedure. Due to the large sample size and the number of analyses performed, Bonferroni-corrections were applied in order to adjust for inflated alpha on all ANOVAs. Within each section, alpha was divided by the number of analyses so that significance was equally apportioned. Significant multivariate main effects and interactions were explored in univariate and stepdown F tests where appropriate.

I. Canonical Correlation Analysis

Canonical correlation analysis was performed in order to examine the multivariate relation between a set of predictor variables which reflects regulation of eating (restraint, disinhibition, perceived hunger and BMI) and a set of criterion variables including self-perceptions and relational perceptions. Tests of multivariate assumptions revealed no major departures from linearity nor was multicollinearity or singularity detected. For boys and girls, some variables showed mild to moderate skewness. Transformation of the variables did not alter the results, thus original data are reported in the text. Each variate (the linear combination of variables in the set) will be interpreted by examining the variables which are correlated with it > .30, i.e., accounting for at least 10%

of the variance in the set. Correlations between the variables and the canonical variates are shown in Table 7.

The canonical correlation analyses for boys revealed one significant pair of variates with $Rc^2 = .13$ ($F(36,998.56) = 1.99$, $p < .001$). The redundancy index showed that the predictor variate explained 5% of the variance in the criterion variate. As expected, the regulation of eating variate was weight related for boys, consisting of high restraint, high disinhibition, high perceived hunger and high BMI. The perceptions dimension associated with the eating dimension included low global self-worth and appearance esteem, high perceived stress, high authoritarian family style and low perceived social support from classmates and teachers.

One significant pair of variates was also revealed for girls, with $Rc^2 = .22$ ($F(36,901.13) = 2.62$, $p < .001$). The redundancy index showed that regulation of eating explained 8% of the variance in self/relational perceptions for girls. Again, as predicted, the regulation of eating dimension for girls did not include BMI as a significant variable. Rather, eating regulation consisted of restraint, disinhibition and hunger. The girls' self/relational perceptions consisted of low global self-worth and appearance esteem, high stress, low family psychological health and low teacher support.

Results of the canonical correlation analysis indicate that regulation of eating predicts small proportions of variance in self-perceptions and the interpersonal environments of boys and girls when weight, restraint and

Table 7

Correlations between each variable and its canonical variate for boys and girls

Variables	Boys Variate Pairs	Girls Variate Pairs
Regulation of eating		
Restraint	.58*	.75*
Disinhibition	.76*	.86*
Perceived hunger	.53*	.43*
BMI	.53*	.09
Self and relational perceptions		
Global self-worth	-.53*	-.81*
Appearance esteem	-.60*	-.77*
Perceived stress	.65*	.68*
Family Psych. Health	-.11	-.51*
Authoritarian Family	.39*	.10
Perc. soc. sup. parent	-.26	-.29
Perc. soc. sup. cl-mate	-.48*	-.01
Perc. soc. sup. teacher	-.47*	-.35*
Perc. soc. sup. friend	.01	-.23
Canonical R^2	.13	.22
Redundancy Indices[a]	.05	.08

* indicates items correlated > .30 with the canonical variate.

[a] Variance in self and relational perceptions predicted by measures of eating regulation

disinhibition are analyzed as continuous variables. Nevertheless, the results confirm differences in regulation of eating between boys and girls as well as some differences and similarities between boys and girls for the perceptions dimension as it relates to regulation of eating.

II. Group Differences as a Function of Weight Category

This first set of analyses of variance is intended to explore the relations between Weight group and self-perceptions, the social environment and eating behaviour.

Self-perceptions

The self-perceptions, global self-worth, appearance esteem and perceived stress, were examined in a 2 (Sex) by 4 (Weight group) MANOVA[1]. Means and standard deviations of global self-worth, appearance esteem and perceived stress by Sex and by Weight group are shown in Table 8. The MANOVA approach was used primarily because of the high inter-correlations among the self-perceptions (global self-worth/appearance esteem, r = .67; global self-worth/perceived stress, r = -.54; appearance esteem/perceived

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[1] Because hypotheses were generated with respect to weight group differences on restraint and disinhibition and significant correlations were noted between the latter two variables and the self-perceptions, MANCOVAS were performed on the self-perceptions, with restraint and disinhibition serving as covariates. All assumptions regarding multivariate analysis of covariance were satisfactorily met. Although both covariates were significant, results of the Sex by Weight group MANCOVA were virtually identical to the results of the MANOVA. In order to preserve clarity of interpretation, only the MANOVA results will be reported.

Table 8

Means and standard deviations of self-perceptions by Sex and by Weight group

	M	SD
Global self-worth		
Boys	3.05[a]	.58
Girls	2.81[b]	.76
Underweight	2.95	.76
Low av. wt.	2.96	.63
High av. wt.	2.93	.70
Overweight	2.90	.68
Appearance esteem		
Boys	2.72[a]	.68
Girls	2.35[b]	.76
Underweight	2.53	.84
Low av. wt.	2.68[a]	.72
High av. wt.	2.53	.72
Overweight	2.30[b]	.67
Perceived stress		
Boys	24.57[a]	6.97
Girls	27.64[b]	7.10
Underweight	25.73	7.19
Low av. wt.	25.63	6.92
High av. wt.	26.50	7.26
Overweight	26.19	7.69

Note: Within each set, means with different superscripts are significantly different following stepdown analyses.

stress, r = -.41). In the following analyses, multivariate strength of association was calculated as Eta^2 = 1 - Lambda (Tabachnick & Fidell, 1989) and univariate strength of association was calculated as R^2 = sum of squares hypothesis/(sum of squares hypothesis + sum of squares error). Order of entry for stepdown analysis was global self-worth, appearance esteem and perceived stress. thus moving from general to specific measures and from trait to situational constructs.

Multivariate significance was assessed by Wilks' criterion, which indicated that the combined dependent variables were significantly related to Weight group ($F(9,1270.56) = 2.70$, $p < .001$, $Eta^2 = .05$) and to Sex ($F(3,522) = 11.35$, $p < .001$, $Eta^2 = .06$) but not to the Interaction ($F(9,1270.56) = .74$, $p > .05$).

Univariate F tests for Weight group indicated that it was primarily appearance esteem that accounted for the significant multivariate Weight group effect ($F(3,524) = 5.11$, $p < .01$, $R^2 = .03$). Univariate tests for global self-worth and perceived stress were not significant ($F(3,524) = .11$, $p > .05$; $F(3,524) = .45$, $p > .05$). Stepdown analysis with global self-worth given highest priority, followed by appearance esteem and then perceived stress, also indicated a significant Weight Group effect for appearance esteem only (Stepdown $F(3,523) = 7.69$, $p < .001$). Results for global self-worth and perceived stress were not significant ($p > .05$).

Tukey post-hoc procedure for Weight group effect on appearance esteem confirmed one hypothesized association; overweight teenagers had the lowest appearance esteem (M = 2.30, SD = .67) significantly lower than low average weight teens (M = 2.68, SD = .72). Appearance esteem for the underweight group (M = 2.53, SD = .84) and the high average weight group (M = 2.53, SD = .73) did not differ significantly from the other Weight groups. Contrary to the predicted results, underweight boys did not report lower appearance esteem than higher weight boys.

Examination of the univariate analyses for the Sex effect indicated that global self-worth ($F(1,524) = 10.62$, $p < .001$, $R^2 = .02$), appearance esteem ($F(1,524) = 24.84$, $p < .001$, $R^2 = .05$) and perceived stress ($F(1,524) = 19.86$, $p < .001$, $R^2 = .04$) each discriminate adolescent boys and girls. As expected, stepdown analyses indicated that, compared to boys, girls reported lower global self-worth ($F(1,524) = 10.62$, $p < .001$), lower appearance esteem (Stepdown $F(1,523) = 24.84$, $p < .001$) and higher perceived stress (Stepdown $F(1,522) = 19.86$, $p < .001$).

Family Functioning

Alpha was set at .025 for the following two analyses. With regards to FPH, the 2 (Sex) by 4 (Weight group) ANOVA failed to reveal significant differences as a function of Sex ($F(1,524) = .52$, $p > .05$), Weight group ($F(3,524) = .41$, $p > .05$) or their Interaction ($F(3,524) = 1.85$, $p > .05$). Contrary to expectation, overweight girls did not report more family dysfunction

that did lower weight girls. Moreover, there were no significant differences on authoritarian family style as a function of Sex ($F(1,524) = 3.88$, $p = .05$), Weight group ($F(3,524) = .27$, $p > .05$) or their Interaction ($F(3,524) = 1.77$) $p > .05$). There was a trend for girls to report somewhat higher authoritarian family styles than did boys. Means and standard deviations for FPH and AFS are shown in Table 9.

Perceived Social Support/Regard

Correlations ranging from .20 to .53 among the four social support scales suggest some overlap in variance especially between parents and classmates ($r = .30$) and classmates and friends ($r = .53$). Unlike the self-perceptions in which the focus is internal, perception of social support/regard is an internally derived perception focused on external events, thus interest was in the four sources of support separately. Univariate analyses were conducted with significance of alpha set at .01 for the four 2 (Sex) x 4 (Weight group) analyses of variance on social support. Means and standard deviations of the social support scales are shown in Table 10. There were no significant Weight group effects for parent ($F(3,524) = .48$, $p > .05$), classmate ($F(3,524) = 2.69$, $p = .05$), teacher ($F(3,524) = .56$, $p > .05$) or friend ($F(3,524) = .14$, $p > .05$) nor were there significant Weight group by Sex interactions for any of the social support scales (parent ($F(3,524) = 1.98$ $p > .05$; classmate ($F(3,524) = 1.44$, $p > .05$; teacher ($F(3,524) = 1.77$, $p > .05$; friend ($F(3,524) = 1.77$, $p > .05$)).

Table 9

Family functioning by Sex and Weight group

	Boys		Girls	
	M	SD	M	SD
Family Psychological Health	.21	4.59	-.23	4.81
Underweight	-1.11	5.22	.47	4.69
Low-average weight	.70	4.43	-.16	4.37
High-average weight	-.02	4.78	-.32	4.98
Overweight	.81	3.65	-.88	5.50
Authoritarian Family	11.38	2.73	12.00	2.85
Underweight	11.49	3.09	11.90	2.66
Low-average weight	10.95	2.64	12.32	2.82
High-average weight	11.54	2.73	11.72	2.77
Overweight	11.88	2.1	12.00	3.30

Table 10

Perceived social support/regard by Sex and Weight group

	Boys		Girls	
Source of support	M	SD	M	SD
Parents	3.21	.61	3.12	.77
Underweight	3.07	.70	3.20	.70
Low-average weight	3.29	.56	3.08	.79
High-average weight	3.18	.63	3.19	.74
Overweight	3.23	.59	2.96	.84
Class-mates	3.17[a]	.49	3.30[b]	.46
Underweight	3.02	.54	3.32	.37
Low-average weight	3.25	.44	3.19	.52
High-average weight	3.18	.52	3.33	.46
Overweight	3.11	.48	3.14	.56
Teachers	2.63	.64	2.77	.62
Underweight	2.73	.72	2.69	.65
Low-average weight	2.73	.59	2.76	.60
High-average weight	2.54	.66	2.81	.65
Overweight	2.53	.60	2.77	.59
Friends	3.30[a]	.68	3.64[b]	.54
Underweight	3.17	.81	3.75	.45
Low-average weight	3.32	.64	3.67	.52
High-average weight	3.32	.74	3.63	.48
Overweight	3.38	.50	3.51	.77

Note: Within each set, means with different superscripts are significantly different.

Significant main effects of Sex were noted for the two peer scales: classmate ($F(1,524) = 9.60$, $p = .002$, $R^2 = .02$) and close friend ($F(1,524) = 34.53$, $p < .001$, $R^2 = .06$). Girls reported higher classmate support ($M = 3.30$, $SD = .46$) than boys ($M = 3.17$, $SD = .49$), higher friend support ($M = 3.64$, $SD = .54$) than boys ($M = 3.30$, $SD = .68$). A trend was also noted for the Sex effect on teacher support ($F(1,524) = 4.41$, $p = .04$) with girls reporting marginally higher teacher support ($M = 2.78$, SD .62) than boys ($M = 2.63$, $SD = .64$). The Sex effect on parent support was not significant ($F(1,524) = 1.77$, $p > .05$).

Eating Behaviour

The threshold of significance was set at .02 for the following three 2 (Sex) by 4 (Weight group) analyses. Means and standard deviations of restraint, disinhibition and perceived hunger by Sex and Weight group are reported in Table 11. Results of the analysis on restraint indicated significant effects of Sex ($F(1,524) = 50.37$, $p < .001$, $R^2 = .09$), and Weight group ($F(3,524) = 29.51$, $p < .001$), $R^2 = .14$. The main effects of Sex and Weight group were qualified by a significant Sex by Weight group Interaction on restraint ($F(3,524) = 3.37$, $p < .02$, $R^2 = .02$).

Tests of the main effects indicated that restraint was significantly related to Weight group for boys ($F(3,275) = 20.59$, $p < .001$, $R^2 = .18$) and for girls ($F(3,249) = 14.19$, $p < .001$, $R^2 = .15$). Tukey post hoc analysis of restraint for boys and girls separately showed that underweight and low average weight

Table 11

Restraint, disinhibition and perceived hunger by Sex and Weight group

	Boys		Girls	
Eating behavior	M	SD	M	SD
Restraint	4.65[a]	3.35	7.68[b]	5.10
Underweight	3.37[a]	2.06	4.44[a]	3.57
Low-average weight	3.41[a]	2.50	6.48[b]	4.78
High-average weight	5.24[b]	3.54	9.47[c]	5.09
Overweight	7.37[c]	3.70	9.58[c]	4.86
Disinhibition	5.08	2.77	5.02	2.90
Underweight	5.59	3.03	4.08[a]	2.30
Low-average weight	4.63	2.51	4.78	2.53
High-average weight	5.08	2.70	5.79[b]	3.25
Overweight	5.60	3.16	4.71	3.07
Perceived hunger	7.65[a]	3.06	6.15[b]	2.81
Underweight	8.49	2.81	6.72	2.87
Low-average weight	7.62	3.26	6.08	2.68
High-average weight	7.41	2.97	6.30	3.11
Overweight	7.47	2.95	5.37	2.19

Note: Within each set, means with different superscripts are significantly different.

boys reported equal restrained eating. Boys' restraint scores were significantly higher in each successive weight group, with overweight boys reporting the most restraint. In contrast, girls' restraint scores increased significantly between underweight and low average weight groups and between low-average and high-average weight groups. There was no significant difference in restraint scores between high-average weight and overweight girls. That is, as expected, not only do girls report more restrained eating than boys, significant increases between weight groups occur at lower weights than was seen for boys.

Results of the 2 (Sex) by 4 (Weight group) ANOVA on disinhibition failed to reveal significant main effects of Sex ($F(1,524) = 2.12$, $p > .05$) or Weight group ($F(3,524) = 2.30$, $p > .05$). A significant Sex by Weight group interaction was noted ($F(3,524) = 3.60$, $p < .02$, $R^2 = .02$).

Tests of the main effect indicated that disinhibition was significantly related to Weight group for girls ($F(3,249) = 3.91$, $p < .01$, $R^2 = .05$) but not for boys ($F(3,275) = .14$, $p > .05$). Tukey post hoc procedure revealed that underweight girls reported the lowest disinhibition, lower than that reported by the high-average Weight group. Contrary to the predicted result, overweight adolescents did not report greater disinhibition than lower weight adolescents.

Perceived hunger did not differ significantly as a function of Weight group ($F(3,524) = 2.29$, $p > .05$), nor did it differ significantly as a function of the Weight group by Sex Interaction ($F(3,524) = .62$, $p > .05$). Sex differences

were noted on perceived hunger ($F(1,524) = 34.36$, $p < .001$, $R^2 = .06$). Boys' perceived hunger was higher than that reported by girls.

Summary of Sex by Weight Group Differences

Deficits in the psychosocial well-being of overweight adolescents as a function of their weight status were found only for appearance esteem. Overweight adolescents reported lower appearance esteem than low average-weight adolescents. No effect of Weight group was found for underweight boys in this sample. Overweight teenagers did not report lower global self-worth or higher perceived stress than teenagers of lower weights. Sex differences in psychosocial well-being were far more prevalent than were Weight group differences. As predicted, girls reported lower global self-worth than boys, lower appearance esteem and higher perceived stress. Regarding the social environment, no Weight group effects were found. Overweight adolescents did not report lower family psychological health (FPH) or higher authoritarian families (AFS) than did lower weight teens, nor did they report lower perceived support/regard from parents, classmates teachers or friends. Sex differences on social environment were noted, however. Girls reported marginally higher authoritarian families, although not significantly so. Girls also reported higher perceived/support regard from peers and somewhat higher perceived support/regard from teachers. Parent support/regard was not significantly different across Weight groups or between boys and girls.

Are overweight adolescents more extreme on eating behaviour? Yes and no. As predicted, girls restrain their eating more than boys, and increases between weight groups start at lower weights than boys. Overweight boys do restrain their eating more than lower weight boys. Boys do not report higher disinhibited eating as a function of Weight group but high-average weight girls report more disinhibited eating than underweight girls.

III. Group Differences as a Function of Restraint Category

The first analysis in this series will examine BMI as a function of Sex and Restraint Category. Results revealed a significant main effect of Sex ($F(1,209) = 16.44$, $p < .001$, $R^2 = .07$) and a significant main effect of Restraint group ($F(1,209) = 79.60$, $p < .001$, $R^2 = .28$). Boys and high restrainers have higher BMI than girls and low restrainers.[1]

Self-perceptions

A 2 (Sex) by 2 (Restraint group) MANOVA was performed on the set of self-perception variables; global self-worth, appearance esteem and perceived stress. Recall that the top and bottom 15% of the sample formed the high and low Restraint groups. Means and standard deviations of the self-perceptions by

[1] Because of the group differences on BMI and because it was expected that high restrainers would also be high disinhibitors, exploratory analyses of covariance were conducted with BMI and disinhibition serving as covariates. In no case was BMI a significant covariate. Disinhibition was a significant covariate in all analyses, but results of the covariate analysis were virtually identical to those without the covariate. In order to provide maximum clarity of interpretation, only the results of ANOVAs will be reported.

Sex and Restraint group are shown in Table 12. Interest in this analysis is primarily on the main effect of Restraint group and Sex by Restraint group interactions.

Multivariate significance as assessed by Wilks' criterion revealed that the combined DVs were related to the main effects of Restraint group ($F(3,207) = 9.41$, $p < .001$), $Eta^2 = .12$ and Sex ($F(3,207) = 5.04$, $p = .002$, $Eta^2 = .07$). Multivariate main effects were qualified by a significant Multivariate Sex by Restraint group Interaction ($F(3,207) = 3.14$, $p < .03$, $Eta^2 = .04$).

The multivariate Sex by Restraint group interaction was further examined in univariate and stepdown analyses. Univariate tests of significance for the Interaction indicated that global self worth ($F(1,209) = 9.47$, $p < .01$, $R^2 = .04$) and appearance esteem ($F(1,209) = 4.22$, $p < .05$, $R_2 = .02$) contributed significantly to the multivariate Interaction. The univariate test for perceived stress was not significant ($F(1,209) = 2.88$, $p > .05$). Stepdown analyses indicated that Sex by Restraint group differences on appearance esteem (Stepdown $F(1,208) = .03$, $p > .05$) could be explained by differences in global self-worth. The absence of a significant Sex by Restraint group interaction on perceived stress was repeated in the stepdown analysis (Stepdown $F(1,207) = .01$, $p > .05$). Tests of main effects indicated that global self-worth differs significantly as a function of Restraint group for girls ($F(1,81) = 18.83$, $p < .001$, $R^2 = .19$) but not for boys ($F(1,128) = 2.29$, $p > .05$). The predicted association between high restraint and low self-esteem was confirmed for girls,

Table 12

Self perceptions by Sex and Restraint group

	Low Rest.		High Restr.	
Self perceptions	M	SD	M	SD
Global self-worth	3.11	.56	2.69	.76
Boys	3.11	.52	2.96	.57
Girls	3.10[a]	.64	2.40[b]	.82
Appearance esteem	2.75[a]	.72	2.23[b]	.79
Boys	2.80	.68	2.49	.76
Girls	2.68	.79	1.93	.73
Perceived stress	25.06	6.49	28.38	7.80
Boys	24.58	6.08	26.11	7.78
Girls	26.00	7.24	30.88	7.12

Note: Within each set, means with different superscripts are significantly different following stepdown analyses.

but not for boys. High restraining girls have significantly lower global self-worth (M = 2.40, SD = .82) than low restraining girls (M = 3.10, SD = .64).

The main effect of Restraint group was also examined in univariate and stepdown analyses in order to explore effects on appearance esteem and perceived stress. Univariate tests revealed that each of the self-perceptions contributed significantly to the Multivariate Restraint group effect. High restrainers have lower global self-worth than low restrainers ($F(1,209) = 22.69$, $p < .001$, $R^2 = .10$), although this result was qualified by the significant Sex by Restraint group interaction noted above. High restrainers also have lower appearance esteem than low restrainers ($F(1,209) = 24.94$, $p < .001$, $R^2 = .11$) and higher perceived stress than low restrainers ($F(1,209) = 10.48$, $p = .001$, $R^2 = 05$). Stepdown analysis indicated significant Restraint group effects on appearance esteem after controlling for global self-worth (the higher priority DV), (Stepdown $F(1,208) = 4.67$, $p < .05$). As predicted, high restrainers have lower appearance esteem than low restrainers, even after controlling for differences in global self-worth. Restraint group differences on perceived stress were not significant (Stepdown $F(1,207) = .53$, $p > .05$) after controlling for the higher priority DVs.

Family Functioning

In the following analyses, interest was on the main effect of Restraint group and the Sex by Restraint group interaction. Means and standard deviations of family functioning variables by Sex and Restraint group are shown

in Table 13, along with those for the social support scales reported in the next section. Significance for alpha was set at .025 for the following two analyses.

The 2 (Sex) by 2 (Restraint group) analysis of variance on FPH indicated no significant effect of Restraint group ($F(1,209) = 3.64$, $p > .05$). There was, however, a significant Sex by Restraint group Interaction ($F(1,209) = 12.19$, $p < .001$, $R^2 = .06$). Tests of main effects indicated that for boys reported FPH did not differ significantly between low and high restrainers ($F(1,128) = 1.53$, $p > 05$). As predicted however, high restraining girls, had significantly lower FPH scores ($M = -2.34$, $SD = 5.10$) than low restraining girls ($M = 1.15$, $SD = 3.95$) ($F(1,8.) = 12.19$, $p < .001$, $R^2 = .13$). Regarding authoritarian family styles, there were no significant effects of Restraint Group ($F(1,209) = 2.27$, $p > 05$), nor was there a significant Sex by Restraint group interaction ($F(1,209) = 3.96$, $p = .05$).

Perceived Social Support/Regard

Significance was set at .01 for the following four analyses. Means and standard deviations of the social support scales by Sex and Restraint group are shown in Table 13. There were no main effects of Restraint on any of the social support scales (parent ($F(1,209$, $p > .05$), classmate ($F(1,209) = .59$, $p > .05$), teacher ($F(1,209) = 2.49$, $p > .05$ or friend ($F(1,209) = 1.21$, $p > .05$), nor were any of the Sex by Restraint group Interactions significant (parent ($F(1,209) = 2.63$, $p > .05$, classmate ($F(1,209) = .18$, $p > .05$, teacher ($F(1,209) = .87$, $p > .05$ or friend ($F(1,209) = .00$, $p > .05$)).

Table 13

Family functioning and perceived social support/regard by Sex and Restraint group

	Low Rest.		High Restr.	
Variable	M	SD	M	SD
Family psychological health	.12	4.74	-.79	4.83
Boys	-.40	4.65	.63	4.14
Girls	1.15[a]	3.95	-2.34[b]	5.10
Authoritarian family style	11.24	2.67	11.84	2.56
Boys	10.78	2.69	11.87	2.32
Girls	12.19	2.40	11.80	2.82
Perceived social support:				
Parents	3.22	.61	3.11	.66
Boys	3.19	.77	3.21	.51
Girls	3.28	.65	3.00	.79
Classmates	3.26	.46	3.24	.50
Boys	3.19	.49	3.11	.51
Girls	3.40	.36	3.38	.45
Teachers	2.71	.62	2.60	.62
Boys	2.63	.64	2.57	.59
Girls	2.86	.55	2.64	.66
Friends	3.49	.61	3.45	.71
Boys	3.36	.65	3.26	.75
Girls	3.75	.42	3.65	.59

Note: Within each set, means with different superscripts are significantly different.

Eating Behaviour

Significance for the following two analyses was set at .025. Means and standard deviations of disinhibition and perceived hunger by Sex and Restraint group are shown in Table 14. Results of the 2 (Sex) by 2 (Restraint group) ANOVA indicated no significant differences in disinhibition as a function of Sex($F(1,209) = .34$, $p > .05$). Significant differences in disinhibition were noted for Restraint group ($F(1,209) = 12.92$, $p < .001$, $R^2 = .06$), qualified by a significant Sex by Restraint group Interaction ($F(1,209) = 12.29$, $p < .001$, $R^2 = .06$)

Contrary to restraint theory and the predicted results, tests of simple effects indicated that boys' disinhibition did not differ significantly as a function of Restraint group ($F(1,128) = .00$, $p > .05$). In contrast, as predicted, high restraining girls reported higher disinhibited eating than low restraining girls ($F(1,81) = 24.47$, $p < .001$), $R^2 = .23$).

With regards to perceived hunger, the main effect of Restraint group was not significant ($F(1,209) = 1.50$ $p > .05$) nor was the Sex by Restraint group Interaction ($F(1,209) = .02$, $p > .05$).

Summary of Sex by Restraint Group Differences

Do adolescents who are relatively extreme on dietary restraint report self-perception and social environment deficits? High restraining girls have lower global self-worth than low restraining girls; the Restraint group effect on global self-worth was not significant for boys. As a group, high restrainers have lower

Table 14

Perceived hunger and disinhibition by Sex and Restraint group

	Perceived Hunger		Disinhibition	
	M	SD	M	SD
Boys:				
Low restrainers	7.60	3.13	5.17	2.80
High restrainers	6.98	3.24	5.09	5.20
Girls:				
Low restrainers	5.98	2.87	4.00[a]	2.27
High restrainers	6.93	3.14	6.83[b]	2.91

Note: Means with different superscripts are significantly different.

appearance esteem than low restrainers but they do not report higher perceived stress. Regarding the social environment, high restraining girls report lower FPH scores than low restraining girls. Boys' family functioning does not differ significantly as a function of Restraint group. There were no differences in social support/regard as a function of Restraint group.

Do adolescents who are high on dietary restraint report more extreme disinhibition than adolescents who are low on restraint? Girls who are high restrainers also report significantly higher disinhibition scores but the relationship between Restraint group and disinhibition scores was not significant for boys. High restraining adolescents do not report more perceived hunger than low restraining adolescents.

IV. Group Differences as a Function of Disinhibition Category

The first analysis in this series will examine BMI as a function of Sex and Disinhibition group. As was the case in the previous section on extreme restraint groups, it seemed reasonable to expect that high disinhibiting boys would have higher BMI than low disinhibiting boys, but that BMI would not differ as a function of Disinhibition group for girls. A 2 (Sex) by 2 (Disinhibition) group ANOVA on BMI failed to reveal a significant Interaction ($F(1,211) = .27$, $p > .05$), nor were there significant main effects of Sex ($F(1,211) = .03$, $p > .05$) or Disinhibition group ($F(1,211) = .33$, $p > .05$). The remaining analyses in the

series are intended to explore self-perceptions, eating regulation and the interpersonal environment as a function of extremes on disinhibition.[1]

Self-perceptions

A 2 (Sex) x 2 (Disinhibition group) MANOVA addresses differences in self-perceptions between adolescents who reported low and high disinhibited eating. As discussed in the Data Analysis part of the Method section, disinhibition groups were formed based on scores at the 15th and 85th percentiles. Means and standard deviations of tne self-perception variables by Disinhibition group are shown in Table 15. Of interest in the following analysis are Disinhibition group effects and Sex by Disinhibition group interactions.

Multivariate significance assessed by Wilks' criterion indicated that the combined self-perceptions were related to Disinhibition group ($F(3,209) = 9.45$, $p < .001$, $Eta^2 = .12$), to Sex ($F(3,208) = 6.41$, $p > .001$, $Eta^2 = .08$) and to their Interaction ($F(3,209) = 3.10$, $p < .05$, $Eta^2 = .04$). Univariate tests of significance for the Sex by Disinhibition group Interaction effect showed that only global self-worth contributed significantly to the Multivariate Interaction ($F(1,211) = 8.42$, $p < .01$, $R^2 = .05$). Appearance esteem was not related to the Sex by Disinhibition group interaction ($F(1,211) = 3.16$, $p > .05$), nor was

[1] In order to ensure that results attributed to the relationship between a dependent variable and Disinhibition group are not in fact due to the relationship between restraint and disinhibition, Sex by Disinhibition group MANCCVAS and ANCOVAS were performed with restraint serving as a covariate. In all cases the covariate was significant, however results were virtually identical to MANOVAS and ANOVAS, therefore only the latter analyses will be reported.

Table 15

Self perceptions by Sex and Disinhibition group

Self perceptions	Low Disinhib.		High Disinhib.	
	M	SD	M	SD
Global self-worth	3.09	.63	2.65	.78
Boys	3.11	.60	2.94	.47
Girls	3.07[a]	.66	2.36[b]	.86
Appearance esteem	2.69	.66	2.30	.84
Boys	2.82	.63	2.60	.84
Girls	2.57	.68	2.00	.74
Perceived stress	24.00[a]	7.69	28.70[b]	7.43
Boys	22.88	7.43	26.74	6.99
Girls	25.00	7.85	30.63	7.41

Note: Within each set, means with different superscripts are significantly different following stepdown analyses.

perceived stress ($F(1,211) = .77$, $p > .05$). Stepdown tests for appearance esteem (Stepdown $F(1,210) = .02$, $p > .05$) and perceived stress (Stepdown $F(1,209) = .91$, $p > .05$) were not significant.

To follow-up the interaction effect on global self-worth, tests of main effects indicated a significant Disinhibition group effect on global self-worth for girls ($F(1,109) = 23.96$, $p < .001$, $R^2 = .18$). High disinhibiting girls had lower global self-worth ($M = 2.36$, $SD = .86$) than low disinhibiting girls ($M = 3.07$, $SD = .66$) ($F(1,109) = 23.96$, $p < .001$). Disinhibition group was not related to global self-worth for boys ($F(1,102) = 2.22$, $p > .05$).

The Multivariate Disinhibition group effect was further examined in univariate and stepdown analyses in order to examine appearance esteem and perceived stress. Each of the self-perceptions contributed significantly to the multivariate effects: global self-worth ($F(1,211) = 22.36$, $p < .001$, $R^2 = .10$), appearance esteem ($F(1,211) = 15.96$, $p < .001$, $R^2 = .07$) and perceived stress ($F(1,211) = 21.85$, $p < .001$, $R^2 = .09$). As noted above, Disinhibition group effects on global self-worth were qualified by a significant interaction. Stepdown analyses revealed that differences in appearance esteem could be accounted for by Disinhibition group differences in global self-worth (Stepdown $F(1,210) = 1.35$, $p > .05$). The relation of Perceived stress to Disinhibition group was significant after entry of the higher priority DV's, (Stepdown $F(1,209) = 4.23$, $p < .05$). High disinhibitors report higher perceived stress than low disinhibitors.

Family Functioning

Significance of alpha for the following two analyses was set at .025. Means and standard deviations of the family functioning variables by Sex and Disinhibition group are shown in Table 16, along with those for the social support scales reported in the next section. There were no significant main effects of Disinhibition group or Sex by Disinhibition group interactions on FPH ($F(1,211) = 1.72$, $p > .05$; $F(1,211) = .75$, $p > .05$, respectively) or on authoritarian family style ($F(1,211) = .05$, $p > .05$; $F(1,211) = .24$, $p > .05$, respectively).

Perceived Social Support/Regard

Because interest was in the social support scales separately, 2 (Sex) by 2 (Disinhibition group) ANOVAs were conducted with the threshold for significance set at .01 for each of the social support/regard scales. Means and standard deviations of social support by Sex and Disinhibition group are shown in Table 16. There were no effects of Disinhibition group on the parent ($F(1,211) = 1.53$, $p < .05$), class-mate ($F(1,211) = .73$, $p > .05$) or close friend ($F(1,211) = .14$, $p > .05$) social support scales. There was an effect of Disinhibition group on the teacher support scale ($F(1,211) = 12.28$, $p = .001$, $R^2 = .05$). Teenagers in the low disinhibition group reported higher support/regard from their teachers ($M = 2.84$, $SD = .62$) than did those in the high disinhibition group ($M = 2.52$, $SD = .69$). Sex by Disinhibition group interactions were not significant for any of the social support scales (parent

Table 16

Family functioning and perceived social support/regard by Sex and Disinhibition group

	Low Disinhib.		High Disinhib.	
Variable	M	SD	M	SD
Family psychological health	.29	4.68	-.92	4.66
Boys	.02	4.61	-.61	4.50
Girls	.53	4.83	-1.22	4.85
Authoritarian family style	11.92	2.99	11.97	2.63
Boys	11.35	2.68	11.62	2.40
Girls	12.42	3.18	12.31	2.81
Perceived social support:				
Parents	3.17	.74	3.06	.68
Boys	3.23	.63	3.10	.55
Girls	3.13	.83	3.02	.79
Classmates	3.24	.49	3.19	.48
Boys	3.23	.55	3.07	.49
Girls	3.25	.43	3.31	.44
Teachers	2.84[a]	.62	2.52[b]	.69
Boys	2.80	.62	2.45	.70
Girls	2.87	.62	2.60	.68
Friends	3.48	.62	3.44	.68
Boys	3.29	.68	3.37	.67
Girls	3.66	.51	3.51	.70

Note: Within each set, means with different superscripts are significantly different.

($F(1,211) = .01$, $p > .05$), classmate ($F(1,211) = 2.69$, $p > .05$), teachers ($F(1,211) = .18$, $p > .05$ or friends ($F(1,211) = 1.76$, $p > .05$).

Eating Behaviour

Significance was set at .025 for the following two analyses. Means and standard deviations of restraint and perceived hunger by Sex and Disinhibition group are shown in Table 17. Results of the 2 (Sex) by 2 (Disinhibition group) ANOVA revealed a significant main effect of Disinhibition group on restraint ($F(1,211) = 15.87$, $p < .001$, $R^2 = .07$) qualified by a significant Sex by Disinhibition group Interaction ($F(1,211) = 29.50$, $p < .001$, $R^2 = .12$). Tests of main effects indicated that high restraining girls disinhibit significantly more than low restraining girls ($F(1,109) = 35.99$, $p < .001$, $R^2 = .25$). The Disinhibition group effect on restraint for boys was not significant ($F(1,102) = 1.43$, $p > .05$).

With regards to perceived hunger, the significant main effect of Disinhibition group ($F(1,211) = 158.16$, $p < .001$, $R^2 = .43$) was qualified by a significant Sex by Disinhibition group Interaction ($F(1,211) = 7.03$, $p < .01$, $R^2 = .03$. Tests of main effects indicated that perceived hunger is related to Disinhibition group for boys ($F1,102) = 127.40$, $p < .001$, $R^2 = .55$) and for girls ($F(1,109) = 45.82$, $p < .001$, $R^2 = .30$).

Summary of Sex by Disinhibition Group Differences

Do adolescents who report more extreme disinhibited eating report lower scores on self-perceptions and social environment variables than do adolescents reporting low disinhibition? High disinhibiting girls, but not boys,

Table 17

Perceived hunger and restraint by Sex and Disinhibition group

	Perceived Hunger		Restraint	
	M	SD	M	SD
Boys:				
Low disinhibitors	4.84[a]	2.56	5.00	3.59
High disinhibitors	10.06[b]	2.13	4.19	3.32
Girls:				
Low disinhibitors	4.82[a]	2.22	5.65[a]	4.03
High disinhibitors	8.22[b]	3.03	10.93[b]	5.19

Note: Means with different superscripts are significantly different.

reported lower global self-worth scores than low disinhibiting girls. High disinhibitors reported more perceived stress than low disinhibitors. There were no effects of Disinhibition group on family functioning, but high disinhibitors did report lower perceived social support/regard from teachers than did low disinhibitors.

Do adolescents who report more extreme disinhibited eating also report higher restraint and perceived hunger scores? High restraint scores were related to the high Disinhibition group for girls, but not for boys.

Discussion

This study was designed to explore the relation between eating behaviour and body weight on one hand and psychosocial well-being on the other in a large non-clinical sample of adolescent boys and girls. The results can be summarized in three main points. First, it seems that eating behaviour and not weight status per se is associated with deficits in psychosocial well-being. Second, the results suggest some limitations of restraint theory with respect to adolescents. Finally, the results presented here suggest different models of eating behaviour for boys and girls.

During the planning of this study, emphasis was placed on examining psychosocial well-being and eating behaviour as a function of adolescents' weight status. As the work progressed, it became clear that weight group categorization was insufficient to fully describe these phenomena. There are

many inconsistencies in the literature with respect to the psychosocial well-being of overweight individuals. The clinical literature generally supports the viewpoint that overweight status is related to deficits in psychosocial well-being, although empirical results have been mixed. The results of this investigation failed to corroborate major differences in psychosocial well-being as a function of weight status.

Overweight adolescents did not report more negative perceptions of themselves in general, nor did they report feeling less in control of their lives than did adolescents in lower weight groups. Concerning perceptions about relationships, overweight adolescents did not report more family dysfunction or lower social support regard than their lower weight counterparts. Among the psychosocial variables examined in this investigation, only appearance esteem decreased significantly in association with weight group. Overweight adolescents reported feeling more negative about their general appearance than did adolescents in lower weight categories. Contrary to prediction, underweight boys did not report low appearance esteem. The range of BMIs among the underweight group was broad and indicated emaciation for some of the boys. The literature (and our data collection experience) indicates that many boys express a desire to be heavier. The use of a height/weight ratio may be insufficient to capture weight-related concerns for adolescent boys. For example, if an underweight or very slim boy is also tall relative to his peers, concern about being under weight may be diminished.

The absence of a weight group effect on global self-worth is counter-intuitive considering the high correlation between global self-worth and appearance esteem. There have been a few studies in which measures of global self-worth were unrelated to weight status, however the literature regarding weight effects on global self-worth remains inconclusive thus no predictions were made regarding the outcome in this investigation. Harter (1988) speculated that individuals who believe themselves to be inadequate on a dimension of the self will discount the importance of that dimension in order to preserve global self-worth. This speculation is reasonable assuming that global self-worth, or self-esteem , is the sum of one's aspirations over one's successes as originally proposed by James (1892). If one discounts appearance as an important feature of the self, then self-perceived deficits in appearance esteem will not be reflected in lower global self-worth. Appearance has long been thought to be an important component of the self-concept, particularly in adolescence. It is not clear how overweight adolescents might be able to discount or minimize the importance of a highly salient and significant domain of the self.

In a provocative paper, Crocker and Major (1989) discuss various strategies by which members of stigmatized groups may protect the integrity of their self-esteem. They argue that the devaluing strategy discussed above may be one of the more difficult because it involves manipulation of the self-concept. Another possible explanation for the preservation of overweight adolescents'

self-esteem is the attribution of negative events to prejudice against their weight status instead of as a consequence of who they are as people. According to Crocker and Major (1989), the discrepancies in the literature with regard to global-self worth deficits among the overweight are similar to inconsistencies found in research with other minority and/or stigmatized groups. The attribution hypothesis may help to explain those discrepancies.

Although there were virtually no differences in psychosocial well-being between weight groups, with the exception of appearance esteem, eating behaviour was related to weight group albeit in different ways for boys and girls. Predictably girls reported more restrained eating than boys and did so at lower weight levels. Although there was a weight effect for girls, restraint seemed to be unrelated to an objective criterion for overweight. In contrast, adolescent boys restrained their eating significantly more as body mass index indicated overweight status. It was interesting to note that there was no relation between weight and disinhibition for boys, despite the relation between weight and restraint. Moreover, overweight girls did not report the highest disinhibition. Perhaps overweight girls find it difficult to report undesirable eating behaviour. An alternative explanation may be found in the measurement of disinhibition used in this investigation. Results of previous research have suggested that the overweight child or adult does not eat to external cues any more than normal weight children or adults (Isbitsky & White, 1981; Rodin, Slochower & Fleming, 1977). The measure used in this study combines eating to external cues and

eating in response to emotions under the heading "disinhibition". An overweight girl could be a high disinhibitor if she regularly "overeats" when she feels anxious, sad, or angry but does not overeat in a variety of contexts. A high "emotional" eater but low "contextual" eater may erroneously present as low on disinhibition on Stunkards' and Messick's (1985) measure.

The results presented here suggest that although weight status per se is not related to psychosocial well-being, at least for adolescents, weight status is associated with restraint and/or disinhibition, even if modified by gender. Since eating behaviour is associated with weight group, perhaps some of the psychosocial deficits reported in the literature are related to eating behaviour and not to weight status, as previously thought. The results of this investigation provide some support for this speculation. When psychosocial well-being was examined as a function of restraint status, or disinhibition status, results often attributed to overweight status were found.

Highly restrained boys and girls reported lower appearance esteem than adolescents who did not restrain their eating; however, only girls also reported lower global self-worth and poor family psychological health as a function of restraint status. Highly disinhibited boys and girls reported higher perceived stress and lower teacher support/regard than their low disinhibition counterparts, but only girls also reported lower global self-worth as a function of disinhibition status. Thus it seems possible that some of the deficits traditionally

associated with overweight are instead a function of eating behaviour, at least for some adolescents.

This study not only differentiates weight status and eating behaviour in relation to psychosocial well-being, but also suggests some limitations to restraint theory with respect to adolescents. As proposed by Herman and Polivy (1985), restraint theory is based on the co-occurrence of restraint and disinhibition. They argue that if one is a chronic dieter, or a restrained eater, then the consequent psychological and physical deprivation will lead to disinhibited eating, i.e., eating to cues other than hunger, overeating or even binge eating. Two assumptions underlying restraint theory are that restraint precedes disinhibition and that restraint and disinhibition are part of one overarching construct. The results of this study suggest that these assumptions may not be tenable in a mixed gender adolescent sample. Consistent with restraint theory, high disinhibiting girls reported more restraint than low disinhibiting girls. Similarly, highly restrained girls reported more disinhibition than girls who did not restrain their eating. Contrary to restraint theory, there was no association between restraint and disinhibition for boys. Thus restraint theory seems more descriptive of adolescent girls. Moreover, it seems unlikely that one would find a relation between weight and restraint but not between weight and disinhibition for boys if disinhibition is simply a part of restraint. In addition, restraint and disinhibition were each associated with different aspects of psychosocial well-being for boys and girls. Taken together, these results

argue for the examination of restraint and disinhibition as functionally different constructs.

One explanation for these results may be that disinhibition holds a different meaning for boys as for girls. Boys reported higher perceived hunger than girls, and their self-report seems to be accurate. Adolescent boys require more calories than girls because of their relatively greater muscular and skeletal mass (Food and Nutrition Board, 1989) and they do eat more than girls (Rolls, Fedoroff, & Guthrie (1991). Interestingly, survey data in the United Stated indicated that, on average, adolescent boys consume the recommended daily number of calories and adolescent girls consume less than the recommended daily amount (NHANES II; Life Sciences Research Office, 1989). Given that boys report more hunger, it may be that boys interpret their food consumption in terms of hunger, rather than in terms of emotions or context. For example, an adolescent boy may acknowledge eating more when he smells a sizzling steak but may attribute the actual eating to hunger rather than to the contextual cue. However, both boys and girls who were high on disinhibition also reported higher perceived stress than low disinhibiting adolescents. The link between stress and disinhibition suggests an emotional component to disinhibition for boys as well as for girls, although it may be unacknowledged for most boys when they think about eating.

Alternatively, because boys in the top 15% of restraint relative to their same sex peers had much lower restraint scores than the girls in the top 15%,

high restraining boys as a group may not suffer the sense of deprivation perceived by girls. It is that sense of deprivation which drives disinhibition according to restraint theory. However, a caveat should probably be kept in mind regarding restraint-driven disinhibition for adolescent girls. Despite the relation between girls' restraint and disinhibition, only 36% of the high disinhibiting girls were also among the top 15% of restrained eaters. High disinhibiting girls are not necessarily extreme restrainers, even if as a group they restrain more than girls who are not highly disinhibited. Perhaps girls feel compelled to at least attempt a compensatory measure for disinhibited eating, while boys feel no such pressure.

The gender related differences in the relation between BMI and restraint, between restraint and disinhibition, and in the psychosocial associations with restraint and disinhibition suggest different models of eating regulation for adolescent boys and girls. When regulation of eating was examined vis a vis psychosocial well-being for the whole sample of boys and girls, different gender related processes were identified. Body mass index was found to be a significant component of eating regulation in the prediction of psychosocial well-being for adolescent boys, but not girls. When high weight, highly restrained eating, high disinhibition and high perceived hunger co-occurred, boys did not feel good about themselves, their appearance or their ability to cope with everyday events in their lives. In addition, they perceived their families as rule-bound (authoritarian family style) and their teachers and classmates as uncaring

and unsupportive. For girls, the co-occurrence of high restraint, disinhibition and perceived hunger was sufficient to predict deficits in psychosocial well-being, without regard to weight status. When girls reported highly restrained, disinhibited and hunger motivated eating, they reported the same negative self-perceptions as boys. In addition, girls described their families as conflicted and lacking in warmth, intimacy, cohesion and mutuality (family psychological health) and they perceived their teachers to be uncaring and unsupportive. These results not only confirm that eating regulation can be problematic and related to deficits in psychosocial well-being for girls, whatever their weight status, they also identify similarities and differences in the process for boys who are overweight.

The poor self-perceptions associated with psychosocial well-being as it relates to regulation of eating was somewhat surprising with regard to boys. Consistent with the literature, this study showed that girls in general have lower self-worth, lower appearance esteem and higher perceived stress than boys. However, overweight boys who restrained, disinhibited, and perceived themselves to be high on hunger also suffered the self-perception deficits thought to be relevant primarily for women. Weight and eating have traditionally been thought to be less meaningful in terms of personal insecurity or risk to sense of self for boys than for girls. In part, this perception may be due to the absence of research on adolescent boys and eating behaviour. In addition, most of the published research has focused on either weight or eating

behaviour rather than on the co-occurrence of these events in relation to well-being.

The gender differences in the relational components of psychosocial well-being are also interesting. Authoritarian family style and family psychological health contrast both in their intimacy and their complexity. The authoritarian style scale taps a system maintenance dimension of family functioning predicated on decision making, rules and punishment. An authoritarian relationship is based on power and control, not on intimacy. Thus for boys, psychosocial well-being, as it relates to eating regulation, is not incumbent upon intimate relationships, but may be related to issues of autonomy and independence. For girls, however, psychosocial well-being is associated with intimate family relationships as represented by family psychological health. These latter results suggest a social element to gender differences in eating behaviour which may be understood in terms of differences in gender-role socialization.

The finding that a deficit in global self-worth was related to regulation of eating for boys when problems with weight, restraint and disinhibition co-occurred compared to the global self-worth deficits found for girls when either restraint or disinhibition was high, regardless of weight status, is perhaps one of the most important findings of the present investigation. Also it seems that appearance esteem is related to weight and to restrained eating for both boys and girls in adolescence. How is it then that girls feel worse about their

appearance than boys, restrain their eating more than boys in a way less objectively related to weight and report more prevalent psychosocial problems than boys? What makes eating behaviour without regard to weight status a predominantly women's issue?

Although the data presented here are correlational, thus precluding any causal statements, the results taken together suggest separate, gender related models of eating behaviour and problematic eating. The integration of three findings with respect to boys suggest that high weight is their key eating behaviour issue, a speculation supported by the epidemiology of eating disorders. These are, (a) the psychosocial deficits for boys only within the context of high BMI with high scores on eating behaviours; (b) the relative absence of effects related to restrained or disinhibited eating as separate constructs; and (c) the seemingly objective relation between BMI and restraint. For girls, however, the global self-worth deficits of high restrainers and/or high disinhibitors, regardless of weight status, along with the finding that high restraining girls report poor overall family functioning suggest that self and relational perceptions, rather than weight status, are key issues in their eating behaviour.

The pursuit of thinness, especially for women, has become a national past-time. It is unlikely, however, that most women are simply passive consumers of the slenderness myth, i.e., if I am slender all will be well. If that were the case we would likely see a much higher percentage of women with

diagnosable eating disorders. Obesity is still far more prevalent than are anorexia and bulimia. To be sure, the incidence of subclinical eating disorders seems to be extraordinarily high for women and girls and undoubtedly the prevailing cultural ideals are influential. In order to subscribe to the thinness myth, however, the obsession with the restriction or consumption of food must develop within a context favourable to cultural influences. For many adolescents that context is likely within the family as purveyors of cultural standards. How are those standards transmitted in such a way as to result in such evident gender differences in eating behaviour?

Psychodynamic and psychoanalytic theoreticians have traditionally explained anomalous eating in terms of a conflict model of psychosexual development. Psychosexual issues may indeed be relevant for some women. More recently though, relational models of development have gained some prominence in the disordered eating literature (Steiner-Adair, 1991). When viewed from a relational standpoint, eating behaviour can more easily be examined in terms of differential gender-role socialization. Some relational theorists have argued that a girl's self identity is more likely to primarily encompass a sense of relatedness and connection with others, with issues of competence and autonomy being secondary. A boy's self identity is more likely predicated on a sense of competence and autonomy and only secondarily on intimate relationships (e.g., Gilligan, 1982; Steiner-Adair, 1991). The results of the present investigation suggest that eating behaviour is in accordance with

hypothesized gender differences in the relational developmental model. Girls' dieting behaviour was associated with the perception of poor intimate family functioning whereas boys' eating regulation was associated with family issues of control and authority.

Support for the idea that eating regulation is primarily related to autonomy for boys and relatedness for girls can be found in the family literature. Recall that there is some evidence suggesting that parents of boys view obesity as a behavioral management problem while parents of girls consider their daughters' obesity to be linked to emotions and lack of internal control (Costanzo & Woody, 1984). Parents of overweight boys may begin to monitor eating and exercise, thereby removing some sense of autonomy and control from their sons. Thus we see problematic eating for boys associated with authoritarian parenting. Parents of girls may attempt to "help" their overweight daughters, but previous research suggests more conflict and family turmoil around issues of eating and weight control than was noted in families of boys (Kinston & Loader, 1984, 1986), thus we see anomalous eating associated with intimate family relationships for girls.

It has been suggested that one reason for parents' differential treatment of eating behaviour for boys and girls is based on the belief that attractiveness and slenderness are more consequential for girls than for boys (Woody, 1986; Woody & Costanzo, 1981). The feared negative consequences for their daughters may motivate some parents to emphasize weight and appearance for

girls, even if they are not objectively overweight, whereas parents of boys may respond only when overweight status is evident. The attitudes of parents towards weight and eating for boys and girls are likely avenues for the transmission of cultural standards through the child's or adolescent's internalization of those attitudes. As Schafer (1968) noted, self-esteem is built upon the internalization of what is estimable about ones' self. Perhaps a meaningful way of interpreting the differences in adolescent boys' and girls' problematic eating is in terms of differences in what is shameful for boys and girls.

Shame has been somewhat neglected in the scholarly literature on obesity and disordered eating perhaps to the detriment of better understanding these problems. One consequence of shame is low self-esteem. The results of the present investigation suggest that it is not overweight status which is shameful for girls, but rather the absence of control reflected in eating behaviours often associated with becoming obese. "To be ashamed is to expect rejection, not so much for what one has done as because of what one is" (Karen, 1992; p. 47). Bruch's client cited earlier feels rejected by her parents - or at least unworthy of their love when she is fat. Under those circumstances she is going to continually try to manage her eating behaviour no matter what her weight status, constantly in the fear of losing parental love and esteem. For adolescent girls whose parents attribute eating behaviour to emotionality, the implicit message is that she is a deficient person. Judith

Rodin, a prominent theoretician and researcher in eating disorders emphasizes the pursuit of thinness as a causal feature of eating disorders. However, she implicitly acknowledges the role of shame in anomalous eating. "When people worry about how they look, they are worrying about who they are" (Rodin, 1992; p. 60). She goes on to say that pre-occupation with body-image, or appearance esteem, is related to the belief that the body is a window to the self.

The causal role of the pursuit of thinness makes the most sense in light of restraint theory. As the present study suggests, however, restraint theory lacks universality at least with respect to adolescents. For boys, the pursuit of thinness itself does not seem to be an issue, unless they are overweight. In that case, what may be shameful for boys is the loss of autonomy so important to their self identity.

What can you do if you feel ashamed? You can try to be better, smarter, more in control and, if you are a woman, prettier and thinner. In fact, perfectionistic tendencies are consistently associated with eating disorders. A promising avenue of research in the literature on eating disorders is focused on what it means to be a successful woman today. The "superwoman syndrome" has been noted in connection with disordered eating with adults and the "budding superwoman" ideal in young girls (Steiner-Adair, 1986; Levine & Smolak, 1992; Proffitt & Smolak, 1995). Increasing demands are placed on young women who believe they must strive towards successful careers, to be competitive yet maintain a caring and empathic ideal consistent with being

successful mothers and wives, and of course to be beautiful and slim while preparing wonderful meals. Bloom and Kogel (1994) note that primary caretakers who are able to appreciate a young women's uniqueness, including body shape and size, are those who able to separate their daughter's value as a person from cultural norms. Steiner-Adair (1986) found that young women who can separate themselves from the super-woman expectation are less likely to develop an eating disorder than those who strive for super-woman status. The type of caretaking described by Bloom and Kogel (1994) is perhaps a factor in the development of the young women described by Steiner-Adair (1986).

There are certain limitations to the present study which should be addressed before discussing the clinical implications of these results. The absence of differences in psychosocial well-being between weight groups may not be generalizable to a morbidly obese population. Although the present sample included adolescents who were considerably overweight, none was more than 100% above average for their height and sex. The morbidly obese adolescent may be more likely to suffer deficits in self- and relational perceptions as a direct function of their weight status. A second limitation is the somewhat risky reliance on self-report measures. Although height and weight were measured, thus allowing objective categorization of weight status, eating behaviour and family functioning were based on self-report alone. Direct observation of eating behaviour and direct contact with families, perhaps in an

interview format, would help to corroborate adolescents' perceptions. The third limitation concerns the measure of social support/regard used in this investigation. The relative absence of effects, particularly for the parent scale, may be a function of our adaptation of a measure designed for use with younger children. Perhaps simply rewording the questions without altering their nature was insufficient to capture adolescent concerns regarding perceived social support/regard. The generality of some of the measures used here may also be limiting. Appearance esteem, while important in the study of disordered eating and obesity, is certainly multi-faceted. Future work should include more specific weight and body-esteem measures. In addition, a general measure of family functioning, while important and yielding interesting results, should be supplemented by measures more specific to eating behaviour. Finally, the correlational data used here prevent any assessment of causality. Of course one cannot manipulate weight status or chronic eating behaviour. Longitudinal studies beginning in early adolescence and moving through young adulthood are important and sadly lacking.

Despite the limitations attached to this investigation, the results are nevertheless quite compelling especially given the large sample size. The traditional clinical view of the poor overweight adolescent suffering tremendous deficits in psychosocial well-being is in need of some revision. Issues around appearance esteem may be more important to some overweight adolescents who are not involved in chronic or extreme dieting or highly disinhibited eating.

When extremes in eating behaviour are in evidence, regardless of the adolescent's weight status, as long as physical health is not in jeopardy, it seems important to address issues of self-identity and shame before (or maybe instead of) addressing eating behaviour or weight status. Moreover, clinicians treating overweight adolescent boys who engage in extremes of eating behaviour should be attuned to the deficits in self-perceptions traditionally associated with women. The shame and humiliation of being unable to meet a perfectionistic standard in often conflicting roles is not likely to diminish in the near future. In fact, as men are increasingly expected to be more nurturing, caring and empathic and thus assume more conflicting roles, it is not unreasonable to expect an increase in disordered eating among men. The un-dieting approach to the treatment of overweight is gaining some popularity in the clinical literature (Polivy & Herman, 1992; Woolly & Woolly, 1984). The perception that the body is a window to the self must also be confronted in the treatment of disordered eating. As Karen (1992) notes, different eras elicit different forms of shame. In the Victorian era sexual impulses could invoke shame. Today, the cultural value of thinness allows shame to be expressed in terms of body image especially for women and perhaps overweight young men who are struggling with food.

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Appendix A

Demographic questionnaire

CONCORDIA UNIVERSITY RESEARCH PROJECT

Today's date: _____ Time: _____

ID#

PLEASE ANSWER THE FOLLOWING QUESTIONS - PLEASE PRINT LEGIBLY

Name: _____ Age _____
Last name First Name

Check one: Male _____ Female _____ Birthday _____
Yr. Mo. Day

Address: _____ Grade _____

_____ School _____
Postal Code

Telephone No. _____

Individuals living with you at home:

Mother _____ Father _____ Guardian _____

Number of Brothers _____ Ages_____

Number of Sisters _____ Ages_____

Others (specify): ----------
(for example: grandmother/grandfather)

I understand the goals and methods of this study and I agree to participate.

_____
Signature

_____
OFFICE USE ONLY

Weight _____

Height _____ Comments

Appendix B

Social Support Scale for Children, adapted for adolescents: Questionnaire and scoring key.

Scoring Key

Items are scored 1 - 4 from left to right. Items which are scored in the reverse are underlined

Parent scale items:	1 5 9 13 17 21
Classmate scale items:	2 6 10 14 18 22
Teacher scale items:	3 7 11 15 19 23
Friend scale items:	4 8 12 16 20 24

PEOPLE IN MY LIFE

I.D.# _____ Date: _____

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
			Sample Item				
	☐	☐	Some teens like to do fun things with a lot of other people	BUT	Other teens like to do fun things with just a few people.	☐	☐
1.	☐	☐	Some teens have parents who don't really understand them	BUT	Other teens have parents who really do understand them.	☐	☐
2.	☐	☐	Some teens have classmates who like them the way they are	BUT	Other teens have classmates who wish they were different.	☐	☐
3.	☐	☐	Some teens have a teacher who helps them if they are upset and have a problem	BUT	Other teens don't have a teacher who helps them if they are upset and have a problem.	☐	☐
4.	☐	☐	Some teens have a close friend to whom they can tell their problems	BUT	Other teens don't have a close friend to whom they can tell problems.	☐	☐
5.	☐	☐	Some teens have parents who don't seem to want to hear about their problems	BUT	Other teens have parents who do want to listen to their problems.	☐	☐
6.	☐	☐	Some teens have classmates that they can become friends with	BUT	Other teens don't have classmates that they can become friends with.	☐	☐
7.	☐	☐	Some teens don't have a teacher who encourages them to do their best	BUT	Other teens do have a teacher who encourages them to do their best.	☐	☐
8.	☐	☐	Some teens have a close friend who really understands them	BUT	Other teens don't have a close friend who understands them.	☐	☐

	Really True for Me	Sort of True for Me			Sort of True for Me	Real Tru for
9.	☐	☐	Some teens have parents who care about their feelings	BUT	Other teens have parents who don't seem to care very much about their feelings.	☐	☐
10.	☐	☐	Some teens have class-mates who sometimes mock or make fun of them	BUT	Other teens don't have classmates who mock or make fun of them.	☐	☐
11.	☐	☐	Some teens do have a teacher who cares about them	BUT	Other teens don't have a teacher who cares about them.	☐	☐
12.	☐	☐	Some teens have a close friend to whom they can talk about things that bother them	BUT	Other teens don't have a close friend to whom they can talk about things that bother them.	☐	☐
13.	☐	☐	Some teens have parents who treat them like a a person who matters	BUT	Other teens have parents who don't usually treat them like a person who matters.	☐	☐
14.	☐	☐	Some teens have class-mates who pay attention to what they say	BUT	Other teens have class-mates who usually don't pay attention to what they say.	☐	☐
15.	☐	☐	Some teens don't have a teacher who is fair to them	BUT	Other teens do have a teacher who is fair to them.	☐	☐
16.	☐	☐	Some teens don't have a close friend who they like to spend time with	BUT	Other teens do have a close friend who they like to spend time with.	☐	☐
17.	☐	☐	Some teens have parents who like them the way they are	BUT	Other teens have parents who wish their kids were different.	☐	☐
18.	☐	☐	Some teens don't often get asked to participate in activities with classmates	BUT	Other teens often get asked to participate in activities with their classmates.	☐	☐
19.	☐	☐	Some teens don't have a teacher who cares if they feel bad	BUT	Other teens do have a teacher who cares if they feel bad.	☐	☐

	Really True for Me	Sort of True for Me			Sort of True for Me	Real True for
20.	☐	☐	Some teens don't have a close friend who really listens to what they say	BUT	Other teens do have a close friend who really listens to what they say.	☐	☐
21.	☐	☐	Some teens have parents who don't act like what their kids do is important.	BUT	Other teens have parents who do act like what their kids do is important.	☐	☐
22.	☐	☐	Some teens often spend recess alone	BUT	Other teens spend recess with their classmates.	☐	☐
23.	☐	☐	Some teens have a teacher who treats them like a person	BUT	Other teens don't have a teacher who treats them like a person.	☐	☐
24.	☐	☐	Some teens don't have a close friend who cares about their feelings	BUT	Other teens do have a close friend who cares about their feelings.	☐	☐

Some of the previous questions pertained to parents in general. The following set of questions may seem repetitious. However, relationships may differ between a teenager and his/her mother and father. Therefore, we would like you to answer the same questions with respect to each of your parents. **PLEASE TURN THE PAGE....**

Appendix C

The Self Perception Profile for Adolescents: Questionnaire and scoring keys for global self-worth and appearance esteem scales.

The Self-Perception Profile for Adolescents

The global self-worth items (9 18 27 36 45) and appearance esteem items (4 13 22 31 40) were used in this study. Because respondents were asked to complete the entire questionnaire, it has been included in the appendix.

SCORING KEY

What I Am Like

Name_____ Age____ Birthday_____ Group____
Month Day

SAMPLE SENTENCE

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
a)	☐	☐	Some teenagers like to go to movies in their spare time	**BUT**	Other teenagers would rather go to sports events.	☐	☐
1.	4	3	Some teenagers feel that they are just as smart as others their age	**BUT**	Other teenagers aren't so sure and wonder if they are as smart.	2	1
2.	1	2	Some teenagers find it hard to make friends	**BUT**	For other teenagers it's pretty easy.	3	4
3.	4	3	Some teenagers do very well at all kinds of sports	**BUT**	Other teenagers don't feel that they are very good when it comes to sports.	2	1
4.	1	2	Some teenagers are *not* happy with the way they look	**BUT**	Other teenagers *are* happy with the way they look.	3	4
5.	4	3	Some teenagers feel that they are ready to do well at a part-time job	**BUT**	Other teenagers feel that they are not quite ready to handle a part-time job.	2	1
6.	4	3	Some teenagers feel that if they are romantically interested in someone, that person will like them back	**BUT**	Other teenagers worry that when they like someone romantically, that person *won't* like them back.	2	1
7.	4	3	Some teenagers usually do the right thing	**BUT**	Other teenagers often don't do what they know is right.	2	1
8.	4	3	Some teenagers are able to make really close friends	**BUT**	Other teenagers find it hard to make really close friends.	2	1
9.	1	2	Some teenagers are often disappointed with themselves	**BUT**	Other teenagers are pretty pleased with themselves.	3	4
10.	1	2	Some teenagers are pretty slow in finishing their school work	**BUT**	Other teenagers can do their school work more quickly.	3	4
11.	4	3	Some teenagers have a lot of friends	**BUT**	Other teenagers don't have very many friends.	2	1
12.	4	3	Some teenagers think they could do well at just about any new athletic activity	**BUT**	Other teenagers are afraid they might not do well at a new athletic activity.	2	1

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
13.	1	2	Some teenagers wish their body was different	BUT	Other teenagers like their body the way it is.	3	4
14.	1	2	Some teenagers feel that they *don't* have enough skills to do well at a job	BUT	Other teenagers feel that they *do* have enough skills to do a job well.	3	4
15.	1	2	Some teenagers are *not* dating the people they are really attracted to	BUT	Other teenagers are dating those people they are attracted to.	3	4
16.	1	2	Some teenagers often get in trouble for the things they do	BUT	Other teenagers usually *don't* do things that get them in trouble	3	4
17.	4	3	Some teenagers do have a close friend they can share secrets with	BUT	Other teenagers do not have a really close friend they can share secrets with	2	1
18.	1	2	Some teenagers don't like the way they are leading their life	BUT	Other teenagers do like the way they are leading their life.	3	4
19.	4	3	Some teenagers do very well at their classwork	BUT	Other teenagers don't do very well at their classwork.	2	1
20.	1	2	Some teenagers are very hard to like	BUT	Other teenagers are really easy to like.	3	4
21.	4	3	Some teenagers feel that they are better than others their age at sports	BUT	Other teenagers don't feel they can play as well.	2	1
22.	1	2	Some teenagers wish their physical appearance was different	BUT	Other teenagers like their physical appearance the way it is.	3	4
23.	4	3	Some teenagers feel they are old enough to get and keep a paying job	BUT	Other teenagers do not feel they are old enough, yet, to really handle a job well	2	1
24.	4	3	Some teenagers feel that people their age will be romantically attracted to them	BUT	Other teenagers worry about whether people their age will be attracted to them.	2	1
25.	4	3	Some teenagers feel really good about the way they act	BUT	Other teenagers *don't* feel that good about the way they often act	2	1
26.	1	2	Some teenagers wish they had a really close friend to share things with	BUT	Other teenagers do have a close friend to share things with.	3	4
27.	4	3	Some teenagers are happy with themselves most of the time	BUT	Other teenagers are often not happy with themselves.	2	1
28.	1	2	Some teenagers have trouble figuring out the answers in school	BUT	Other teenagers almost always can figure out the answers.	3	4

	Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
29.	4	3	Some teenagers are popular with others their age	BUT	Other teenagers are not very popular.	2	1
30.	1	2	Some teenagers don't do well at new outdoor games	BUT	Other teenagers are good at new games right away.	3	4
31.	4	3	Some teenagers think that they are good looking	BUT	Other teenagers think that they are not very good looking.	2	1
32.	1	2	Some teenagers feel like they could do better at work they do for pay	BUT	Other teenagers feel that they are doing really well at work they do for pay.	3	4
33.	4	3	Some teenagers feel that they are fun and interesting on a date	BUT	Other teenagers wonder about how fun and interesting they are on a date.	2	1
34.	1	2	Some teenagers do things they know they shouldn't do	BUT	Other teenagers hardly ever do things they know they shouldn't do.	3	4
35.	1	2	Some teenagers find it hard to make friends they can really trust	BUT	Other teenagers *are* able to make close friends they can really trust.	3	4
36.	4	3	Some teenagers like the kind of person they are	BUT	Other teenagers often wish they were someone else.	2	1
37.	4	3	Some teenagers feel that they are pretty intelligent	BUT	Other teenagers question whether they are intelligent.	2	1
38.	4	3	Some teenagers feel that they are socially accepted	BUT	Other teenagers wished that more people their age accepted them.	2	1
39.	1	2	Some teenagers do not feel that they are very athletic	BUT	Other teenagers feel that they *are* very athletic.	3	4
40.	4	3	Some teenagers really like their looks	BUT	Other teenagers wish they looked different.	2	1
41.	4	3	Some teenagers feel that they are really able to handle the work on a paying job	BUT	Other teenagers wonder if they are really doing as good a job at work as they should be doing	2	1
42.	1	2	Some teenagers usually *don't* go out with the people they would really like to date	BUT	Other teenagers *do* go out with the people they really want to date.	3	4
43.	4	3	Some teenagers usually act the way they know they are supposed to	BUT	Other teenagers often don't act the way they are supposed to.	2	1
44.	1	2	Some teenagers *don't* have a friend that is close enough to share really personal thoughts with	BUT	Other teenagers do have a close friend that they can share personal thoughts and feelings with.	3	4
45.	4	3	Some teenagers are very happy being the way they are	BUT	Other teenagers wish they were different.	2	1

Appendix D

The Perceived Stress Scale: Questionnaire and scoring key.

Scoring Key for the Perceived Stress Scale

Items on the Perceived Stress Scale are score from 0 (never) to 4 (very often), high scores indicating high stress. The following items are scored in reverse (4 5 6 9 10).

ID# _____

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the past two months. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

0. Never
1. Almost never
2. sometimes
3. fairly often
4. very often

1. In the last two months, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last two months, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last two months, how often have you felt nervous and "stressed" ?	0	1	2	3	4
4. In the last two months, how often have you dealt successfully with irritating life hassles?	0	1	2	3	4
5. In the last two months, how often have you felt that you were effectively coping with important changes that were going on in your life?	0	1	2	3	4

0. Never

1. Almost Never

2. Sometimes

3. Fairly Often

4. Very Often

6. In the last two months, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
7. In the last two months, how often have you felt confident that things were going your way?	0	1	2	3	4
8. In the last two months, how often have you felt that you could not cope with all the things that you had to do?	0	1	2	3	4
9. In the last two months, how often have you been able to control irritations in your life?	0	1	2	3	4
10. In the last two months, how often have you felt on top of things?	0	1	2	3	4
11. In the last two months, how often have you been angered because of things that happened that were outside of your control?	0	1	2	3	4
12. In the last two months, how often have you found yourself thinking about things that had to be accomplished?	0	1	2	3	4
13. In the last two months, how often have you been able to control the way you spend your time?	0	1	2	3	4
14. In the last two months, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Appendix E

The Self-Report Measures of Family Functioning: Questionnaire and scoring keys.

Center for Research in Human Development

Concordia University -- Montreal, Quebec

I.D.# _____ Date: _____

Instructions: This questionnaire is designed to give you an opportunity to describe your family anonymously. There are no right or wrong answers. Each question has four possible answers, and you simply mark the square under what you believe to be the most accurate answer for each question. The four possible answers are: (1) very untrue for our family; (2) fairly untrue for our family; (3) fairly true for our family; and (4) very true for our family.

You may feel that some statements are very true for some family members and less true or untrue for others. Judge each statement in terms of most family members. If the family seems equally distributed, decide on your overall impression and answer accordingly.

Remember, we would like to know what your family seems like to you. Do not try to figure out what other people might think of your family, but give us your impressions of your family. Be as careful and honest as you can, and be sure to answer all of the questions.

Statement	1 Very untrue for my family	2 Fairly untrue for my family	3 Fairly true for my family	4 Very true for my family
1. There is strict punishment for breaking rules in our family.	1	2	3	4
	Authoritarian Family			
2. Family members seem to avoid contact with each other when at home.	4	3	2	1
	Cohesion			
3. Family members hardly ever lose their tempers.	4	3	2	1
	Conflict			
4. Family members feel guilty if they want to spend some time alone.	1	2	3	4
	Enmeshment			
5. Our family does not discuss its problems.	4	3	2	1
	Expressiveness			

Statement	1 Very untrue for my family	2 Fairly untrue for my family	3 Fairly true for my family	4 Very true for my family
6. There are very few rules in our family.	4 Authoritarian Family	3	2	1
7. Family members find it hard to get away from each other.	1 Enmeshment	2	3	4
8. Family members sometimes get so angry they throw things.	1 Conflict	2	3	4
9. Family members really help and support one another.	1 Cohesion	2	3	4
10. Family members feel pressured to spend most free time together.	1 Enmeshment	2	3	4
11. Family members discuss problems and usually feel good about the solutions.	1 Expressiveness	2	3	4
12. We really get along well with each other.	1 Cohesion	2	3	4
13. Parents make all of the important decisions in our family.	1 Authoritarian Family	2	3	4
14. Members of our family can get away with almost anything.	1 Permissive Family	2	3	4
15. Each family member does as he or she wishes without concern about the others.	1 Disengagement	2	3	4
16. Family members are severely punished for anything they do wrong.	1 Authoritarian Family	2	3	4
17. In our family, parents do not check with the children before making important decisions.	4 Democratic Family	3	2	1

Statement	1 Very untrue for my family	2 Fairly untrue for my family	3 Fairly true for my family	4 Very true for my family
18. Each family member has at least some say in major family decisions.	1	2	3	4
	Democratic Family			
19. We don't tell each other about our personal problems.	4	3	2	1
	Expressiveness			
20. There is a feeling of togetherness in our family.	1	2	3	4
	Cohesion			
21. Our family is as well adjusted as any family in this world could be.	1	2	3	4
	Family Idealization			
22. Family members rarely criticize each other.	4	3	2	1
	Conflict			
23. Our family doesn't do things together.	4	3	2	1
	Cohesion			
24. My family could be happier than they are.	4	3	2	1
	Family Idealization			
25. Family members are not punished or reprimanded when they do something wrong.	1	2	3	4
	Permissive Family			
26. I don't think any family could live together with greater harmony than my family.	1	2	3	4
	Family Idealization			
27. It is hard to know what the rules are in our family because they always change.	1	2	3	4
	Permissive Family			
28. Members of our family generally go their own way.	1	2	3	4
	Disengagement			
29. Nobody orders anyone around in our family.	4	3	2	1
	Authoritarian Family			
30. In our family we know where all family members are at all times.	4	3	2	1
	Disengagement			

Statement	1 Very untrue for my family	2 Fairly untrue for my family	3 Fairly true for my family	4 Very true for my family
31. The children in our family have little influence on anything of real importance.	4	3 Democratic Family	2	1
32. I don't think anyone can possibly be happier than my family and I when we are together.	1	2 Family Idealization	3	4
33. Family members feel free to say what is on their minds.	1	2 Expressiveness	3	4
34. It is difficult for family members to take time away from the family.	1	2 Enmeshment	3	4
35. Family members discuss family problems and solutions together.	1	2 Democratic Family	3	4
36. We fight a lot in our family.	1	2 Conflict	3	4
37. Family members are extremely independent.	1	2 Disengagement	3	4
38. It is unclear what will happen when rules are broken in our family.	1	2 Permissive Family	3	4
39. In our family it is important for everyone to express their opinion.	1	2 Expressiveness	3	4
40. We keep each other informed of our activities in case we are needed.	4	3 Disengagement	2	1
41. Family members sometimes hit each other.	1	2 Conflict	3	4
42. There is strong leader ship in our family.	4	3 Permissive Family	2	1

Statement	1 Very untrue for my family	2 Fairly untrue for my family	3 Fairly true for my family	4 Very true for my family
43.My family has all the qualities I would want in a family.	1	2 Family Idealization	3	4
44.It seems like there is never any place to be alone in our house.	1	2 Enmeshment	3	4
45.Family members make the rules together.	1	2 Democratic Family	3	4

Appendix F

The Three Factor Eating Questionnaire, adapted for adolescents: Questionnaire and scoring key.

Directions for Scoring the Eating Inventory

Each item in Part I and Part II is scored "0" or "1". If the answer is "True" the item is scored one. Scoring of the items in Part II is determined by splitting the responses at the middle. If the item is to the left it is scored "0"; if the item is to the right it is scored "1". Items which are underlined are scored in reverse.

Factor 1 (cognitive restraint):	6 10 14 20 23 25 29 31 33 34 36 37 38 44 45 46 47 49 50 52 54
Factor 2 (disinhibition):	1 2 7 9 11 13 15 17 22 28 32 37 40 42 53 55
Factor 3 (perceived hunger):	3 4 5 8 12 18 21 24 26 27 30 35 48 51
Unscored Items:	16 19 41 43

MY EATING HABITS I.D.# _____ Date: _____

WE WOULD LIKE TO FIND OUT ABOUT YOUR EATING HABITS, THAT IS HOW YOU FEEL ABOUT EATING AND HOW MUCH WEIGHT YOU HAVE GAINED OR LOST. THERE ARE NO RIGHT OR WRONG ANSWERS BECAUSE PEOPLE ARE DIFFERENT IN WHAT THEY EAT AND HOW MUCH THEY EAT. PLEASE CIRCLE "TRUE" OR "FALSE" FOR EACH STATEMENT IN PART I.

PART I

1.	When I smell a sizzling steak or see a juicy piece of meat, I find it very hard not to eat, even if I have just finished a meal.	True	False
2.	I usually eat too much at parties and picnics.	True	False
3.	I am usually so hungry that I eat more than three times a day.	True	False
4.	When I have eaten my share of calories, I am usually good about not eating any more.	True	False
5.	Dieting is hard for me because I just get too hungry.	True	False
6.	I deliberately take small helpings to control my weight.	True	False
7.	Sometimes things just taste so good that I keep on eating even when I am no longer hungry.	True	False
8.	Since I am often hungry, I often wish an expert would tell me that I have had enough or that I can have something more to eat.	True	False
9.	When I feel nervous, I find myself eating.	True	False
10.	Life is too short to worry about dieting.	True	False
11.	Since my weight goes up and down, I have gone on diets more than once.	True	False
12.	I often feel so hungry that I just have to eat something.	True	False
13.	When I am with someone who is overeating, I usually overeat.	True	False
14.	I have a pretty good idea of the number of calories in common foods.	True	False
15.	Sometimes when I start eating, I just can't seem to stop.	True	False
16.	Since I know how guilty I will feel afterwards, I rarely go on eating binges.	True	False

17.	It is not hard for me to leave something on my plate.	True	False
18.	At certain times of the day I get hungry because I have gotten used to eating then.	True	False
19.	Sometimes I get so nervous that I just have to eat something.	True	False
20.	While on a diet, if I eat a food that is not allowed, I eat less for a while afterward to make up for it.	True	False
21.	Being with someone who is eating often makes me hungry enough to eat also.	True	False
22.	When I feel sad, I often overeat.	True	False
23.	I enjoy eating too much to spoil it by counting calories or watching my weight.	True	False
24.	When I see a real treat, I often get so hungry that I have to eat it right away.	True	False
25.	I often stop eating when I am not full so that I won't eat so much.	True	False
26.	I get so hungry that my stomach often feels like a bottomless pit.	True	False
27.	I am always hungry so it is hard for me to stop eating before I finish the food on my plate.	True	False
28.	When I feel lonely, I make myself feel better by eating.	True	False
29.	I eat less at meals so I won't gain weight.	True	False
30.	I sometimes get very hungry late in the evening or at night.	True	False
31.	I eat anything I want, anytime I want.	True	False
32.	Without even thinking about it, I take a long time to eat.	True	False
33.	I count calories to control my weight.	True	False
34.	I do not eat some foods because they make me fat.	True	False
35.	I am always hungry enough to eat at any time.	True	False
36.	I pay a great deal of attention to changes in my size.	True	False
37.	While I'm on a diet, if I eat a food that is not allowed, I often then splurge and eat other fattening foods.	True	False

MY EATING HABITS (continued)

PART II

ANSWER THE FOLLOWING QUESTIONS BY CIRCLING THE ANSWER THAT IS RIGHT FOR YOU.

38. Do you feel bad about yourself after you eat too much?

Never Sometimes Often Always

---

39. How often are you dieting?

Never Sometimes Often Always

---

40. Do you eat the right amounts in front of others and eat too much when you are alone?

Never Sometimes Often Always

---

41. What is the most weight you have ever lost in one month?

0-4 pounds 5-9 pounds 10-14 pounds

15-19 pounds more than 20 pounds Do not know

---

42. What is the most weight you have gained in one week?

0-1 pounds 1-2 pounds 2-3 pounds

3-5 pounds more than 5 pounds Do not know

---

43. In an average week, how much does your weight change?

0-1 pounds 1-2 pounds 2-3 pounds

3-5 pounds more than 5 pounds Do not know

---

44. How much do you pay attention to what you are eating?

Not at all A little bit Pretty much Very much

---

45. If you gained or lost 5 pounds, would it affect the way you live your life?

Not at all A little bit Pretty much Very much

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46. Do you think of yourself as

Very underweight A little underweight

About the right weight A little overweight

Very overweight

---

47. How often do you feel hungry?

Only at meal times Sometimes between meals Often between meals Almost always

---

48. How hard would it be for you to stop eating half-way through dinner and not eat for the next four hours?

Easy Slightly hard Moderately hard Very hard

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49. How often do you skip a meal to make sure you don't eat so much?

Almost never Seldom At least once a week Almost everyday

---

50. Do you eat slowly so that you won't eat so much?

Almost never Seldom Sometimes Often

---

51. How often do you skip dessert because you are no longer hungry?

Almost never Seldom At least once a week Almost everyday

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52. How often do you eat less than you want?

Almost never | Seldom | Sometimes | Often

---

53. Do you go on eating binges even though you are not hungry?

Never | Rarely | Sometimes | At least once a week

---

54. Which describes you best? Circle the right number.

(1) I eat whatever I want, whenever I want

(2) I usually eat whatever I want, whenever I want

(3) I often eat whatever I want, whenever I want

(4) I often limit the amount I eat, but I often "give in"

(5) I usually limit the amount I eat, and rarely "give in"

(6) I always limit the amount I eat, and never "give in".

---

55. Is this a good description of you?

"I start dieting in the morning, but because of things that happen during the day, I give up and eat whatever I want. I promise myself that tomorrow I will start a new diet".

Not like me | A bit like me | A lot like me | Exactly like me

Appendix G

Description of study for school board administrators.

The present research project, funded by the Ministry of Education of the Province of Quebec (FCAR), is being conducted by a three-member team, each with a specific interest and focus for their work. The projects are related conceptually and thematically, and share a common methodological approach.

The past 10 to 15 years have been marked by an increasing interest in childhood obesity and eating disorders. This interest has grown with research indicating that childhood obesity predicts adult obesity and may be associated with health problems. There is also evidence that obesity seriously affects the quality of children's and adolescents' lives; that is, overweight is associated with reduced self-esteem and negative interactions with peers.

One purpose of the present study is to explore the relationship between parents' attitudes and behaviours and self-esteem in overweight adolescents, compared to normal weight adolescents. Parents of overweight children face the problem of trying to encourage them to lose weight. The parents act as society's agents by communicating negative feelings about overweight, by encouraging the child to diet, and by trying to control the child's eating behaviour. The development of obesity in children places parents in the position of being unable to accept their children "as they are", a primary requisite in the development of self-esteem.

Another problem which arises is whether low self-esteem is related to eating problems and serves to maintain overweight. The question of whether low self-esteem may actually interfere with attempts at weight loss is an important one. Recently, research has indicated that dieting may lead to behaviour in which the adolescent first attempts strict control over eating and then overindulges. This diet-binge syndrome is a common eating pattern in adolescents and, in exaggerated forms, is a primary feature of anorexia, bulimia and obesity. This pattern is most often reported in young women, although men are not immune. Very little research on this topic has been conducted with teenage boys and we are interested in examining weight related sex differences. Recent research with adults indicates that low self-esteem is related to overeating in women dieters. The second purpose of this study is to investigate whether low self-esteem is related to dieting in overweight adolescents.

During adolescence, friendship and peer relations become increasingly important contributors to self-esteem along with continued parental influence. The third goal of this study is to examine how normal weight and overweight adolescents perceive the social support available to them from their peers. Little

is known about how parental attitudes may influence children's peer relationships.

An increasing number of Canadian families are seeking professional help for weight-related problems with their children. Requests for help for adolescent girls are about four times more frequent than for boys. Clinicians need to know what parental attitudes and practices are linked to the maintenance of obesity prone and dieting behaviour and how these attitudes may differentially affect boys and girls. These studies can potentially contribute to such knowledge as well as increasing our understanding of the inter-relatedness of family and peer relationships in the maintenance of self-esteem in adolescence.

Appendix H

Description of study as presented to students for recruiting subjects.

Hello, my name is Evelyn Schliecker. I am from the Centre for Research in Human Development at Concordia University. The _____ School Board, your principal and teachers have kindly let me come into your classes to describe some research we are doing in schools and to ask you to participate. First, I will tell you what you will be doing if you decide to participate. Then I will tell you what this research is about and why it is important for us to have all, or most, of you participate.

First, what is involved? We want to take your height and weight measurements and we have a series of questionnaires for you to complete. You will not have to compose anything - you simply check off your answers to different questions - I will tell you in just a minute what the questions are about. It will take about 45 minutes to do and you will not have to use your free time - we are doing the study right here in the classroom.

Developmental psychologists know a lot about how infants and young children develop. And we know a fair amount about older children and early adolescents and college students. The research team I work with would like to know more about your age group. We are interested in what teenagers can tell us about themselves in three areas of psychology: (1) relationships with your family and your friends, (2) how you feel about yourselves and (3) your eating habits. There are no right or wrong answers to any of the questions we will be asking. We simply want to know what you can tell us about yourselves. For example, one of the family question is "There are strict rules in our family - yes or no". A self-question would be something like "I like myself the way I am - yes or no"; an eating habits question would be "I am conscious of calories when I eat". Each of these three areas of psychology are important to well-being. Based on what we learn from research we can find out what the average teenager thinks - we can design better treatment for teenagers who need help and design better education programs which can reassure people that what they're feeling is normal. It is very important research and we would appreciate your help. It may not touch you directly now, but what we learn my someday help a friend, or a brother or sister, or even someday your children.

All of the information you give us confidential. No one outside the research team, including your parents and teachers, will see the answers you give. Your names will not even appear on the questionnaires. Everyone is assigned a number and that is all that will be on the questionnaires you complete.

Besides making an important contribution to research, we have some prizes to offer. We will be having a raffle in each school. Everyone who participates in

the study will have a chance to win one of 10 pairs of movie passes. There are several good reasons for you to participate in this project. You will help us to have a better understanding of what you are about, you will have a chance to do something different for a class period, and you will have a chance to win a prize.

I am handing out a written description of the study, along with a place to sign a consent form. Please complete the consent form as soon as possible and either deposit it in a box that will be set-up in the guidance office. Or mail it back to us in the enclosed envelope. But do it right away. We are starting in two weeks and we have to know how many of you are going to work with us.

Appendix I

Relative Weight

In addition to calculating Body Mass Index (BMI), deviation from average weight was evaluated using the Baldwin-Wood height-weight charts for boys and girls aged 6 to 19 year (Jeliffe, 1966). Average weight for height, sex and age was determined from the chart and deviation from average calculated as "Percent Overweight = (actual weight - average weight)/(average weight) x 100.

Although BMI is the weight index used most often, up until recently relative weight was used more often than BMI. There now seems to be a consensus that BMI is more highly related to morbidity and mortality than is relative weight, and that BMI is a more accurate (albeit still indirect) measure of adiposity.

The means, standard deviations and ranges of relative weight for boys and girls classified as underweight, low-average weight, high-average weight and overweight according to BMI are shown in Table I-1. Comparison of these data with the BMI data shown in Table 4 (page 47) indicate some overlap across groups. However, BMI and relative weight were correlated .98 and most of the subjects remained in the same weight category regardless of the measure used.

Table I-1

Means, standard deviations and ranges of relative weight for boys and girls classified as underweight, low-average, high-average and overweight according to BMI

	Boys	Girls
	M (SD) Range	M (SD) Range
Underweight	-9.17 (7.41) -35/+6 n=41	-9.69 (4.53) -19/0 n=30
Low average weight	2.06 (5.33) -9/+23 n=99	-.03 (3.67) -8/+8 n=87
High average weight	17.30 (6.23) +5/+34 n=96	12.25 (5.35) +2/+26 n=89
Overweight	44.51 (15.98) +26/+86 n=43	35.82 (3.37) +20/+76 n=38