Preventing Weight and Muscle Concerns among Preadolescents

Kate Holt
B.App.Sci (Psych) (Hons)

Submitted in fulfillment of the requirements for the degree of Doctor of Psychology (Health)

School of Psychology
Faculty of Health and Behavioural Sciences
Deakin University
Melbourne, Australia

January 2005
I certify that the thesis entitled:

**Preventing Weight and Muscle Concerns among Preadolescents**

submitted for the degree of Doctor of Psychology (Health) is the result of my own work and that where reference is made to the work of others, due acknowledgment is given.

I also certify that any material in the thesis which has been accepted for a degree or diploma by any other university or institution is identified in the text.

Full Name: Kate Eloise Holt

Signed: [Signature Redacted by Library]

Date: 20.6.05
Acknowledgements

Firstly, I would like to acknowledge my supervisor, Dr Lina Ricciardelli, for her continual and undivided support, direction, and guidance during my postgraduate studies. Thank you for sharing your overwhelming knowledge and expertise with me. You have been an inspiration!

Secondly, I would like to thank my co-supervisor, Professor Marita McCabe, for her assistance during the developing and planning stages of my thesis.

I would also like to thank my family, including my parents, Gerard and Genine, and my sister, Jessica, for their love, patience, and understanding over the past seven years. Thank you also for your words of encouragement and motivation which urged me to persevere with my thesis.

Finally, I would like to thank my fellow health doctorate companions, Sandra, Lorraine, and Jade. Thank you for keeping spirits high and helping me through the challenging times.
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Abstract

The high level of weight and shape concerns amongst preadolescent children has prompted interest in the development of prevention programs for this age group. In the 1990s weight and shape concerns were considered primarily an adolescent phenomenon. However, prevention programs which have been designed with adolescent and adult populations have been found to show limited success. Some researchers have argued that programs which target preadolescent children are more likely to be effective than programs that target adolescents, as by adolescence many attitudes and behaviours have become entrenched so they may be more difficult to modify. On the other hand, children's weight and shape concerns are believed to be more malleable and amenable to change. To date there have been limited controlled studies implementing prevention programs designed to reduce weight and shape concerns with preadolescent populations.

The new study conducted as part of this thesis involves the development and implementation of the "Everybody's Different, Nobody Else Is Me" preadolescent prevention program. The program was designed to address some of the methodological biases of past research and incorporate three risk factors, social comparisons, negative affect, and self-esteem, to reduce and/or prevent the development of weight and muscle concerns among children. These three risk factors have been found to be associated with weight and shape concerns of adolescents and adults, and there is also increasing evidence that they are important factors among children. Research also suggests that social comparisons, negative affect, and self-esteem are interrelated, which highlights the importance of targeting the variables in one program.

The new five session prevention initiative was implemented with 156 grade four children. Both the treatment and control conditions consisted of 78 children. Preliminary evidence from the new prevention initiative indicated that the program reduced muscle bulk and exercise (i.e., an over-emphasis on exercise to lose weight rather than health promotion), and negative affect in the long term as assessed by the six month follow-up. At the six month follow-up, children in both the treatment and control conditions reported reduced negative affect, dieting, and muscle bulk and exercise scores and increased positive affect. Consistent with short term follow-up results, boys reported
greater muscle bulk and exercise scores than girls at the six month follow-up. Girls, in both conditions, were also found to report greater positive affect than boys. These findings are discussed in relation to past research, and suggestions for future prevention initiatives are highlighted.
PART I. LITERATURE REVIEW

Part I of this thesis examines the prevalence of weight and muscle concerns among children. It also provides a review of the preventive efforts that have been designed and evaluated to reduce these concerns. The last chapter in this section examines three risk factors, namely social comparisons, negative affect, and self-esteem, that have been found to be associated with weight and muscle concerns amongst adolescents and young adults.

During the last decade there has been increasing evidence that preadolescent children display weight and muscle concerns (Collins, 1991; Davison, Markey, & Birch, 2000, 2003; Edlund, Halvarsson, & Sjoden, 1996; Grogan & Richards, 2002; Kelly, Ricciardelli, & Clarke, 1999; Kostanski, Fisher, & Gullone, 2004; Kostanski & Gullone, 1999; Rolland, Farnhill, & Griffiths, 1997; Sands & Wardle, 2003; Thelen, Powell, Lawrence, & Kuhnert, 1992). These include: body image concerns, dieting practices, exercising to lose weight, binge eating behaviour, preoccupation with food, and muscle bulk and exercising concerns (Holt & Ricciardelli, 2002; Ricciardelli & McCabe, 2001). The prevalence of weight and muscle concerns among children aged between 5 and 13 years is reviewed in Chapter 1.

Prior to the early 1990s, problem eating attitudes and behaviours were primarily considered to be concerns associated with the onset of puberty in adolescence. It is now accepted that children with weight and muscle concerns may be at risk of developing chronic health problems, such as high blood pressure or diabetes, and of developing eating disorders, such as anorexia nervosa, later in life (Deckelbaum & Williams, 2001; Shisslak et al., 1998). Therefore, it is important that studies investigate the development and prevalence of body image concerns, and problem eating attitudes and behaviours in preadolescence, and the factors that promote these attitudes and behaviours so that appropriate educational programs for young children can be developed and implemented.

Although there is extensive evidence that preadolescent children display weight and muscle concerns, the majority of past prevention programs have targeted
adolescents and young adults. A review and evaluation of these studies is presented in Chapter 2. Fewer studies have examined prevention initiatives with preadolescent children. These studies are reviewed and evaluated in Chapter 3.

Three risk factors, social comparisons, negative affect, and self-esteem, have been studied in adolescent and adult populations in relation to both weight and shape concerns (Leon, Fulkerson, Perry, & Early-Zald, 1995; Paxton, Schutz, Wertheim, & Muir, 1999; Schutz, Paxton, & Wertheim, 1999; Stormer & Thompson, 1996). There is increasing evidence that these three risk factors are also important in the development of weight and muscle concerns in childhood (Holt & Ricciardelli, 2002; Martin et al., 2000; Ricciardelli, McCabe, Holt, & Finemore, 2003; Tiggemann & Wilson-Barrett, 1998; Veron-Guidry, Williamson, & Netemeyer, 1997; Wood, Becker, & Thompson, 1996). Chapter 4 examines these three risk factors that have been found to be associated with weight and shape concerns amongst adolescents and young adults. Emerging research which suggests a relationship between these three risk factors and the development of weight and muscle concerns in child populations will also be reviewed.

Social comparisons, negative affect, and self-esteem are also closely interrelated. It is believed that individuals who exhibit negative affect and low self-esteem are more likely to engage in negative social comparison or upward social comparison practices. Similarly, engaging in negative social comparison practices contributes or maintains an individual’s sense of negative affect and low self-esteem (Beck, Rush, Shaw, & Emery, 1979; Durkin, 1995). An individual experiencing negative affect and low self-esteem in relation to body image concerns is also more likely to engage in negative social comparisons with others who are deemed “better off”, and hence may engage in dieting practices in order to decrease this discrepancy (Durkin, 1995; Schutz et al., 1999; Stormer & Thompson, 1996). Veroff (1969) stipulated that young children engaging in social comparison processes may be at an increased risk of engaging in risk-taking behaviours because, for the greater part, young children are surrounded by older and more knowledgeable individuals. In this respect, negative social comparisons by young children can contribute to or maintain a sense of negative affect and low self-esteem influencing body image interpretations and promoting engagement in problem eating
attitudes and behaviours. Therefore, all three of these risk factors are important variables that need to be considered together in the development of prevention programs.
Chapter 1. The Prevalence of Weight and Muscle Concerns in Preadolescence

This chapter provides a review of the current literature regarding the prevalence of weight and muscle concerns among children aged between 5 and 13 years (Ricciardelli & McCabe, 2001; Thompson & Smolak, 2001). A summary of the prevalence rates of body image concerns, problem eating, and muscle concerns in preadolescence will be provided. Also included will be a discussion of the changing societal ideal body type. Weight and muscle concerns in preadolescence occur with lower frequency and severity than in adolescence and young adulthood, however, these behaviours and concerns have been identified as risk factors for the later development of eating disorder symptomatology (Deckelbaum & Williams, 2001; Shisslak et al., 1998).

1.1 Body Image Concerns

The days of the idolised voluptuous female figures from the 1940s and 50s have long disappeared with the emergence of a new thin ideal (Hargreaves & Tiggemann, 2003; Lamb, Jackson, Cassiday, & Priest, 1993; Ricciardelli & McCabe, 2001). It is well established that the mass media is a powerful force, which has contributed to women’s perceptions of the ideal body size and shape (Hargreaves & Tiggemann, 2003; Lamb et al., 1993). It now appears that sociocultural pressures are also influencing young children as they are engaging in similar problem eating practices and experiencing similar body concerns as their parents to obtain their ideal (Grogan & Wainwright, 1996; Lamb et al., 1993).

In their review of the current literature, Ricciardelli and McCabe (2001) reported estimates of children’s body dissatisfaction, based on the figure preference task. They found that between 28% and 55% of girls preferred a thinner ideal body size, and between 17% and 30% of boys preferred a thinner ideal body size than their perceived body size. Only 4% to 18% of girls reported a preference for a larger or broader ideal body size, and 13% to 48% of boys reported a preference for a larger or broader ideal body size than their perceived body size (Ricciardelli & McCabe, 2001). Smolak and Levine (2001a) in a review of body image concerns in childhood, found that a smaller percentage of children report body dissatisfaction than adolescents and young adults.
However, recent studies suggest that children may be internalising weight and shape concerns at a younger age and subsequently report greater body dissatisfaction as they progress through childhood to adolescence, particularly for girls (Smolak & Levine, 2001a).

In a qualitative study, Grogan and Wainwright (1996) interviewed four girls aged 8 years and four girls aged 13 years regarding weight concerns and body dissatisfaction. Two of the 8 year old participants reported feeling fat and three of the 13 year old participants were dissatisfied with their bodies. Furthermore, all of the younger girls stated that they would like to have a thin body as they grew older. Older girls reported more ambiguous feelings, stating that they thought skinny models were unattractive but they were also envious of peers whose body type reflected those of the skinny ideal.

In a more recent study, Field et al. (1999) examined body dissatisfaction amongst 14,972 boys and girls aged 9 to 14 years in a longitudinal study. They found that whilst a greater percentage of boys (26%) were overweight in comparison to girls (19%), a greater percentage of girls (25%) than boys (22%) perceived themselves to be overweight. Moreover, the distortion between actual and perceived weight increased with age. Among the girls aged 9 years, 4.2% had a distorted body image. This percentage rose to 19% in girls aged 14 years old. Whilst the same trend was found for boys, the distinction was less prominent.

Other studies have also shown that girls experience greater body image dissatisfaction than boys (Collins, 1991; Lawrence & Thelen, 1995; Ricciardelli et al., 2003; Wood et al., 1996). However, there is an increasing consensus among researchers that gender differences do not emerge until 8 or 10 years of age (Gardner, Friedman, Stark, & Jackson, 1999; Thelen et al., 1992; Ricciardelli & McCabe, 2001). It is believed that prior to this age children either do not accurately comprehend the measurement instruments or have not internalized sociocultural messages regarding the thin ideal for girls or the muscular ideal for boys (Ricciardelli & McCabe, 2001). Collins found that 30% of boys and 42% of girls, in a sample of 1118 children with a mean age of 7.97 years, chose a thinner ideal self figure on the child figure rating scale. Collins found that only 23% of boys and 14% of girls chose a heavier ideal self figure on the
child figure rating scale. Similarly, Wood et al. examined body image dissatisfaction in 95 boys and 109 girls aged 8 to 10 years and found that girls had significantly greater dissatisfaction with their bodies than boys. Additionally, girls indicated that they wanted to be thinner than their present body figure.

Tiggesmann and Wilson-Barrett (1998) studied children's figure ratings with 140 children aged 7 to 12 years and reported that girls typically preferred a thinner ideal self figure. Girls also thought that boys would prefer a thinner girl figure (attractive to opposite sex) than that reported as most attractive to boys (attractive in opposite sex) (Tiggesmann & Wilson-Barrett, 1998). In another study, Kostanski and Gullone (1999) examined children's body image concerns among 431 boys and girls 7 to 10 years of age. Results indicated that 25% of boys and 33% of girls perceived themselves as larger than their ideal self figure. Furthermore, girls were found to report greater body dissatisfaction than boys. In a more recent study of children's body image concerns with a sample of 507 children aged 8 to 11 years, Ricciardelli et al. (2003) found that a larger proportion of girls (47.4%) than boys (38.4%) desired a thinner body size. On the other hand, a greater number of boys (20.7%) than girls (14.1%) desired a larger body size.

More recent research also indicates that children as young as 5 years of age exhibit body dissatisfaction and express weight concerns (Davison et al., 2000, 2003). Davison et al. (2000) examined body satisfaction and weight concerns in 197 girls aged 5 years old. The findings indicated that 21% of girls reported being concerned with their weight. Whilst body image concerns are being reported by children at a younger age, children also report greater body dissatisfaction as they grow older. Sands and Wardle (2003) investigated the internalisation of ideal body shapes in 356 girls aged 9 to 12 years. In this sample 48% reported that their ideal body figure was thinner than their perceived current body figure and 22% stated that they were "too fat".

Cross-sectional and longitudinal studies show that boys' body dissatisfaction remains fairly stable across time (Gardner et al., 1999; Gardner, Sorter, & Friedman, 1997). However, a number of studies have shown that girls' body dissatisfaction increases as they grow older (Field et al. 1999; Gardner et al., 1999; Gardner et al., 1997; Thelen et al., 1992). In one study, Sands, Tricker, Sherman, Armatas, and
Maschette (1997) investigated body image concerns in 61 preadolescent school children aged 10 to 12 years over a period of nine months. They found that both girls and boys reported that they wanted to be thinner, however, this finding was more salient and occurred at an earlier age for girls than boys (Sands et al., 1997). In a longitudinal study, Gardner et al. (1999) examined body size estimations among 216 children over a three-year period, beginning at ages 6, 9, and 12 years. They found that while boys’ body dissatisfaction remained low over the three-year sequence, girls’ body dissatisfaction significantly increased from the age of 9 to 14 years. Furthermore, Field et al. in a cross-sectional analysis examined weight concerns among 16, 114 children aged 9 to 14 years. Findings indicated that girls’ body dissatisfaction increased from 4.2% in girls aged 9 years to 19% in girls aged 14 years.

Another factor, which has been found to be closely associated with body image concerns among children is body mass index (BMI). Children with a large BMI or classified as overweight have been found to report greater body image concerns than average-weight children (Kostanski et al., 2004; Ricciardelli et al., 2003; Rolland et al., 1997; Vander Wal & Thelen, 2000). Rolland et al. investigated body dissatisfaction in 244 children aged 8 to 12 years and reported that 88% of girls and 55% of boys whose BMI was in the upper quartile or overweight range wanted to be thinner. Furthermore, 76% of girls and 56% of boys whose BMI was in the upper quartile or overweight range preferred a thinner ideal self figure. Additionally, 71% of girls and 52% of boys whose BMI was in the upper quartile or overweight range had tried to lose weight (Rolland et al., 1997).

Vander Wal and Thelen (2000) also examined body dissatisfaction among 526 overweight and average-weight children aged 9 to 11 years. Vander Wal and Thelen found that overweight children reported greater body dissatisfaction than their average-weight counterparts. In another study, Ricciardelli et al. (2003) investigated body image concerns amongst 507 children aged 8 to 11 years. Findings indicated that BMI was strongly associated with body dissatisfaction. Children with a larger BMI were found to report greater body image concerns.
In a recent study, Kostanski et al. (2004) examined body dissatisfaction in relation to BMI among 199 boys and 232 girls aged 7 to 10 years. Kostanski et al. found that girls classified as overweight reported greater body dissatisfaction than girls classified as normal or underweight, with girls classified as underweight reporting the least dissatisfaction. Other results indicated that boys classified as overweight and underweight reported the greatest body dissatisfaction with normal weight boys reporting minimal body dissatisfaction. However, boys classified as overweight reported greater body dissatisfaction than those classified as underweight. These findings may reflect sociocultural pressures to obtain the thin ideal for females and the muscular ideal for males (Kostanski et al., 2004; Ricciardelli & McCabe, 2004).

A review of the literature shows that children are reporting body image concerns at a younger age in the new millennium, as children as young as 5 years of age have been found to report body image concerns (Davison et al., 2000, 2003). In addition, girls have been found to report greater body dissatisfaction than boys (Collins, 1991; Kostanski & Gullone, 1999; Lawrence & Thelen, 1995; Ricciardelli et al., 2003; Wood et al., 1996). Furthermore, as children progress through middle childhood they have been found to report increasing body dissatisfaction (Field et al., 1999; Gardner et al., 1999; Gardner et al., 1997; Sands & Wardle, 2003; Thelen et al., 1992). This trend is, however, more salient for girls than boys (Collins, 1991; Gardner et al., 1999; Ricciardelli et al., 2003; Tiggemann & Wilson-Barrett, 1998). Finally, body image concerns have also been found to be associated with other risk factors, such as a large BMI (Kostanski et al., 2004; Ricciardelli et al., 2003; Rolland et al., 1997; Vander Wal & Thelen, 2000).

1.2 Problem Eating

Problem eating among children includes engaging in unmonitored dieting practices, exercising to lose weight, binge eating behaviour, and preoccupation with food (Holt & Ricciardelli, 2002; Ricciardelli & McCabe, 2001). One measure which is frequently used to assess these attitudes and behaviours is the Children’s Eating Attitudes Test (ChEAT) (Maloney, McGuire, & Daniels, 1988; McVey, Tweed, & Blackmore, 2004; Ricciardelli & McCabe, 2001; Rolland et al., 1997; Thomas, Ricciardelli, & Williams, 2000; Veron-Guidry & Williamson, 1996). The ChEAT
consists of 26 items which yield three dimensions of eating disturbance: dieting and purging behaviour, food preoccupations, and social pressures to eat (Maloney et al., 1988). Scores greater than 20 on the ChEAT are indicative of problem eating and provide a guideline for identifying children who are at high risk of developing an eating disorder, such as anorexia nervosa. Maloney et al. examined ChEAT scores among 318 children aged 8 to 13 years. Results indicated that 7% of children scored within the high risk range. For participants in grades 4, 5, and 6, results indicated that girls scored higher on the ChEAT, indicative of problem eating, than the boys. In another study, Rolland et al. examined eating attitudes of 244 Australian primary school children aged 8 to 12 years and found that 14% of girls and 8% of boys scored above 20 on the ChEAT. In a recent study, McVey, Tweed, et al. (2004) examined the prevalence of problem eating attitudes and behaviours among 1577 girls aged 10 to 12 years. Results indicated that 9.2% of girls scored within the high risk range on the ChEAT.

Whilst both boys and girls have been found to report problem eating, this trend has been found to be more salient among girls. In one study, Shisslak et al. (1998) explored weight control practices among fourth, fifth, and sixth grade girls and found that 19.6% of primary school girls frequently exercised and 17% frequently tried to eat fewer fats and sweets to lose weight. In addition, 16.8% of primary school girls reported trying to eat less in order to lose weight a lot of the time. In another study, Schur, Sanders, and Steiner (2000) examined dieting in young children aged 8 to 13 years and found that 48.3% of boys and 51.7% of girls wanted to weigh less. Furthermore, 41.9% of boys and 12.9% of girls had previously engaged in some form of activity, such as exercising or changing food choices, in an attempt to increase or decrease their weight.

Whilst most research that has examined problem eating amongst children is cross-sectional, a few longitudinal studies have also been conducted. In a recent longitudinal follow-up, Davison et al. (2003) examined problem eating and dieting practices in 182 girls aged from 5 to 9 years of age. Results indicated that weight concerns and body dissatisfaction of girls across ages 5 to 7 years were found to predict greater dieting practices at age 9 years. In addition, girls who reported weight concerns and body dissatisfaction at 5, 7, and 9 years of age and those girls who reported weight concerns and body dissatisfaction at 7 and 9 years of age only were found to report
greater problematic eating attitudes at 9 years of age. Similar to Davison et al. (2003), Field et al. (2003) conducted a longitudinal follow-up study examining dieting behaviour among 8203 girls and 6769 boys aged 9 to 14 years. At the first testing period 25% of girls and 13.6% of boys were engaging in infrequent dieting practices to lose or maintain weight. Follow-up data over two years demonstrated that the number of girls who were dieting increased whilst the number of boys dieting remained constant. Girls and boys engaging in dieting practices were also significantly more likely to engage in binge eating practices.

Problem eating has also been found to be more prevalent among older children (Field et al., 2003; Ricciardelli & McCabe, 2001; Rolland et al., 1997; Thelen et al., 1992). In one study, Thelen et al. examined problem eating among 191 children. Thelen et al. found that older girls (aged 9 to 13 years) were more concerned about becoming overweight than younger girls (aged 7 to 9 years). Inconsistent with Thelen et al., Rolland et al. investigated the ChEAT scores of 244 children in grades three, four, five, and six. Rolland et al. found that grade three children (aged 8 to 9 years) scored significantly higher on the ChEAT than fourth, fifth, or sixth grade children (aged 9 to 12 years). However, this result has been interpreted as suggesting that some young children may not fully understand the questions presented in the ChEAT and the instrument may not be reliable for testing problem eating of young children (Rolland et al., 1997). Instruments like the ChEAT have been found to be more reliable when used with children aged 10 and older (Ricciardelli & McCabe, 2001).

BMI has also been found to be associated with problem eating among children (Braet & Wydhooge, 2000; Davison et al., 2003; Kostanski & Gullone, 1999; Ricciardelli et al., 2003; Thompson & Smolak, 2001; Vander Wal & Thelen, 2000). In one study, Kostanski and Gullone examined problem eating among 431 boys and girls aged 7 to 10 years. Results indicated that overweight children reported greater problem eating than normal or underweight children. In addition, children who perceived themselves as large were found to engage in greater restrictive eating practices. Vander Wal and Thelen examined eating practices among 526 overweight and average-weight elementary school children aged 9 to 11 years. Vander Wal and Thelen found that overweight children were more likely to engage in dieting behaviours than average-
weight children. Braet and Wydhooge also examined dieting practices in 745 overweight and average-weight children aged 9 to 11 years. They found that 6.5% of the sample engaged in dieting practices. Of those children engaging in dieting practices, 12% were found to be moderately overweight and 23% extremely overweight. Furthermore, Braet and Wydhooge’s findings suggest that weight per se is the best predictor of dieting practices in children aged 9 to 11 years of age. Finally, in a longitudinal study of 197 girls at ages 5, 7, and 9 years, Davison et al. found that girls who reported greater dieting practices and larger BMI across ages 5 to 7 years reported greater dieting practices at age 9 years.

Cross-sectional and longitudinal studies with preadolescent populations have shown that both boys and girls exhibit problem eating (Davison et al., 2003; Field et al., 2003; McVey, Tweed, et al., 2004; Shisslak et al., 1998). However, studies suggest that girls engage in more problem eating practices, such as dieting, than boys (Edlund et al., 1996; Holt & Ricciardelli, 2002; Lawrence & Thelen, 1995; Rolland et al., 1997). Overall, older children have also been found to exhibit greater problem eating than younger children (Field et al., 2003; Ricciardelli & McCabe, 2001; Rolland et al., 1997; Thelen et al., 1992). In addition, children identified as overweight or those who have a larger BMI have been found to exhibit more problem eating than their normal weight counterparts (Braet & Wydhooge, 2000; Davison et al., 2003; Kostanski & Gullone, 1999; Ricciardelli et al., 2003; Thompson & Smolak, 2001; Vander Wal & Thelen, 2000).

1.3 Muscle Concerns

Whilst girls’ body image concerns focus primarily on an unrealistically thin ideal, boys’ body image concerns focus on a more muscular “V-shape” ideal (Hargreaves & Tiggesmann, 2003; McCabe & Ricciardelli, 2004; Ricciardelli & McCabe, 2004; Ricciardelli et al., 2003). Boys’ preference for a muscular body has been shown to develop between the ages of 6 and 7 years (Spitzer, Henderson, & Zivian, 1999). Muscle bulk, however, is typically inconsistent with the skinny ideal preferred by girls. Grogan and Wainwright (1996) in a qualitative study of eight girls, four girls aged 8 years and four girls aged 13 years, found that all girls expressed a dislike for excessive
muscle bulk on females. However, in a more recent study by Grogan, Evans, Wright, and Hunter (2004), seven women body builders, reported their ideal as athletic, toned, and healthy. Furthermore, one participant reported that her toned body was “what people are looking for now”. However, the preference for a thin female body prevails with a smaller number of females counteracting the mainstream ideal (Grogan et al., 2004).

Whilst muscular definition is preferred by boys, only a small number of studies have investigated the influence of the muscular ideal portrayed in the media and the prevalence of boys’ muscle concerns (Grogan & Richards, 2002; Holt & Ricciardelli, 2002; Murmen, Smolak, Mills, & Good, 2003; Ricciardelli & McCabe, 2001; Ricciardelli et al., 2003; Smolak, Levine, & Thompson, 2001). Smolak et al. (2001) investigated the awareness and the internalization of the muscular ideal in 505 boys and girls in grades six and seven. For boys, internalization or adoption of the muscular ideal and attractiveness of the muscular look was found to be associated with engagement in weight loss activities. In addition, internalization of the muscular ideal was found to be associated with engagement in muscle building techniques.

In another study, Grogan and Richards (2002) examined body shape ideals and exercise practices via focus groups with boys and men aged 8 to 25 years. The study included four 8 year old boys, four 13 year old boys, eight 16 year old males and four 19 to 25 year old males. Findings from the focus groups suggested that all males perceived muscle tone and muscle mass as important. Furthermore, 16 year old male participants reported peer pressure to obtain a muscular body. All participants reported exercising to avoid getting fat but not to improve their body image which was considered appropriate for females only.

In another study, Holt and Ricciardelli (2002) investigated muscle preoccupation in 236 children aged between 8 and 10 years and found that a greater proportion of boys (84.3%) than girls (57.4%) indicated, at least sometimes, that they exercise to become more muscular. Furthermore, 56.8% of boys reported thinking about increasing their muscles when they exercise compared to 47% of girls. Forty-nine percent of boys indicated that they think a lot about the muscles on their body whilst only 18.7% of girls reported engaging in these same cognitions. Finally, 77.5% of boys and only 23.9% of
girls reported that they wanted to gain muscle bulk. Whilst Holt and Ricciardelli demonstrated that boys engage in greater muscle bulk and exercising practices than girls, Ricciardelli et al. (2003) further found that having a muscular and toned body is as important to boys, as a skinny and thin ideal is to girls. Ricciardelli et al. examined body image concerns and body change strategies, including muscle bulk concern, satisfaction, and importance, among 507 children aged 8 to 11 years. Results indicated that a larger proportion of boys (59.5%) than girls (37.8%) rated their muscles as important. Furthermore, a larger proportion of boys (51.4%) than girls (26.4%) reported frequently exercising in order to increase muscle bulk, and similarly, more than twice as many boys (48.9%) than girls (17.4%) reported thinking about changing their exercise habits to increase muscle bulk.

In another recent study, Murnen et al. (2003) examined children's responses to pictures depicting the muscular ideal for males and the slender ideal for females. Participants included 88 girls and 58 boys aged 6 to 12 years. Findings indicated that a larger proportion of boys than girls reported that they could engage in exercising practices to obtain their ideal. For boys, internalisation of the muscular ideal was found to be positively associated with liking how the male models looked, aspiring to look like the models and rating muscle bulk as important.

Like body image concerns and problem eating, muscle concerns have been found to be related to BMI. Ricciardelli et al. (2003) found that BMI is associated with children's scores of muscle importance. In addition, children with a larger BMI reported greater perceived pressure from parents, peers, and the media to increase muscle bulk than children with a smaller BMI. For girls only, larger BMI and reported high perceived pressure from parents, peers, and the media to increase muscle bulk was found to be associated with increased engagement in strategies to increase muscle bulk. In another study, Holt and Ricciardelli (2002) found BMI to be associated with muscle preoccupation for girls only. Therefore, girls with a larger BMI were more likely to report muscle preoccupations but not boys. This finding suggests that irrespective of body size and weight, all boys may exhibit muscle concerns. Whilst body image concerns and dieting are considered normative amongst girls, muscle concerns may be considered normative amongst boys in the new millennium.
The few studies which have examined the prevalence of muscle concerns in preadolescence suggest that boys report greater muscle concerns than girls (Grogan & Richards, 2002; Holt & Ricciardelli, 2002; Murnen et al., 2003; Ricciardelli & McCabe, 2001; Ricciardelli et al., 2003; Smolak et al., 2001). Furthermore, children classified as overweight or who have a large BMI have been found to report greater muscle concerns than their average-weight counterparts. This finding is more salient for girls than boys (Holt & Ricciardelli, 2002; Ricciardelli et al., 2003). However, muscle concerns may be as normative for boys as body image concerns and problem eating are for girls.

1.4 Summary and Conclusion

There is increasing evidence that children aged between 5 and 13 years of age experience body image concerns and exhibit problem eating behaviours (Collins, 1991; Davison et al., 2000, 2003; Edlund et al., 1996; Field et al. 2003; Kelly et al., 1999; Kostanski & Gullone, 1999; McVey, Tweed, et al., 2004; Rolland et al., 1997; Sands & Wardle, 2003; Thelen et al., 1992). Results suggest that girls experience greater body dissatisfaction and problem eating than their male counterparts (Collins, 1991; Edlund et al., 1996; Holt & Ricciardelli, 2002; Kostanski & Gullone, 1999; Lawrence & Thelen, 1995; Ricciardelli et al., 2003; Rolland et al., 1997; Wood et al., 1996). Body dissatisfaction and problem eating have also been found to increase with age (Field et al., 2003; Field et al., 1999; Gardner et al., 1999; Gardner et al., 1997; Ricciardelli & McCabe, 2001; Rolland et al., 1997; Thelen et al., 1992; Sands & Wardle, 2003). This is particularly salient for girls (Collins, 1991; Gardner et al., 1999; Tiggesmann & Wilson-Barrett, 1998; Ricciardelli et al., 2003). Overweight children or children with a large BMI are more likely to report body dissatisfaction and exhibit problem eating than average-weight children (Braet & Wydhooge, 2000; Davison et al., 2003; Kostanski et al., 2004; Kostanski & Gullone, 1999; Ricciardelli et al., 2003; Rolland et al., 1997; Thompson & Smolak, 2001; Vander Wal & Thelen, 2000).

In more recent research, boys aged 6 to 7 years have been found to exhibit a preference for a large and muscular ideal (Grogan & Richards, 2002; Holt & Ricciardelli, 2002; Murnen et al., 2003; Ricciardelli et al., 2003; Smolak et al., 2001;
Spitzer et al., 1999). Boys have also been found to engage in exercising practices to obtain this ideal (Holt & Ricciardelli, 2002; Murnen et al., 2003; Ricciardelli et al., 2003; Smolak et al., 2001). Furthermore, boys and girls classified as overweight or who have a large BMI have been found to report greater muscle concerns (Holt & Ricciardelli, 2002; Ricciardelli et al., 2003). This finding is more salient for girls than boys. However, boys of all different body shapes and sizes may exhibit muscle concerns.
Chapter 2. Review of Prevention and Intervention Programs with Adolescents and Adults

The majority of prevention programs designed to reduce weight and shape concerns have been developed and implemented with adolescents and adults. These prevention efforts are evaluated and reviewed in this chapter. Four theoretical frameworks are examined: an information-based strategy to prevention, the disease-specific pathways model to prevention, the nonspecific vulnerability-stressor model to prevention, and the empowerment-relational model to prevention. The reviewed prevention programs are classified and grouped according to the main model utilised. The strengths and weaknesses of these theoretical perspectives to prevention are also discussed.

The development and implementation of prevention programs designed to reduce body image concerns and problem eating attitudes and behaviours began in the late 1980s. Prevention programs were introduced due to the increasing incidence rates of sub-clinical and clinical levels of eating disorders, and the difficulty in treating individuals with anorexia nervosa or bulimia (Levine & Smolak, 2001; Neumark-Sztainer, Butler, & Palti, 1995). During this time, extensive research has also examined the potential risk and protective factors associated with weight and shape concerns (Neumark-Sztainer et al., 1995; Wertheim, Paxton, & Blaney, 2004). Despite the vast array of literature, only a small number of programs have been found to be successful at reducing weight and shape concerns among adolescents and adults (Levine & Smolak, 2001; Paxton, 2002a, 2002b; Stice & Hoffman, 2004).

In one review of the literature, Levine and Smolak (2001) identified 42 studies outlining prevention programs with non-clinical child and adolescent populations. The prevention programs were designed to assess the short-term changes in weight and shape concerns of individuals aged 8 to 18 years. Levine and Smolak found that 27 or 64.29% of the studies showed at least one significant positive change in relation to body dissatisfaction or eating problems. In another review of the literature, Paxton (2002a, 2002b) identified 28 controlled studies designed to either prevent or ameliorate body dissatisfaction or reduce risk factors associated with eating disorder symptomatology
among children, adolescents, and adults. Fourteen or 50% of the studies were found to report a positive post-test effect in relation to body dissatisfaction. Furthermore, 11 or 39.29% of the studies were found to report a positive post-test effect in relation to eating behaviour. In a more recent review of prevention programs, Stice and Hoffman (2004) identified 37 controlled studies outlining eating disorder programs implemented with children, adolescents, and adults. Stice and Hoffman found that 22 or 59.46% of the studies indicated at least one significant positive change in relation to risk factors associated with eating pathology, such as body dissatisfaction. In addition, 6 or 16.22% of the studies showed significant reductions in eating pathology, such as binge eating practices. However, the success of prevention programs was often short-term with positive changes diminishing at six month follow-up. Furthermore, prevention programs have typically focused on adolescent females and have excluded males.

2.1 An Information-Based Strategy to Prevention

The earliest type of prevention program focused primarily on providing adolescents and adults with information pertaining to eating disorders, including symptomatology. In addition, prevention efforts included providing information regarding the associated health risks of engaging in problem eating attitudes and behaviours, such as engaging in food restriction behaviours. Whilst adolescents’ knowledge regarding eating disorders and problem eating increases, adolescents’ attitudes, values, beliefs, and behaviours surrounding these practices have seldom been shown to change (Abascal, Bruning Brown, Winzelberg, Dev, & Barr Taylor, 2004; Paxton, 1993; Withers, Twigg, Wertheim, & Paxton, 2002).

In one of the earliest prevention studies, Paxton (1993) employed an information-based strategy to examine weight loss behaviours, disordered eating, and body image concerns in 136 year nine girls. One hundred and seven girls participated in five sessions focusing on the media portrayal of thinness, determinants of body size, healthy and unhealthy weight control methods, successful and unsuccessful dieting practices, and eating practices associated with emotions. The remaining 29 girls acted as a control comparison. Results indicated that the intervention program was ineffective in reducing weight loss behaviours and disordered eating, with scores remaining consistent
over a one-year period. Moreover, the girls from the intervention program reported increased levels of body dissatisfaction over the one-year period. As a result, this type of program has been criticised as being potentially harmful (O’Dea & Abraham, 2000). The program implemented by Paxton may have increased girls’ knowledge and awareness of eating disorders and methods of food restriction, such as successful dieting which is endorsed by the program. The program could also be potentially harmful due to the age of the participants and the onset of puberty with girls experiencing bodily changes which are often in conflict with the slimness ideal.

Similar to Paxton (1993), Santonastaso et al. (1999) implemented an information-based intervention program designed to reduce problem eating and body attitudes in 254 girls aged 16 years. Girls were allocated to either the intervention program or the control group. Girls were further identified as being at low risk or high risk of developing an eating disorder based on baseline measures. The program consisted of four two hour weekly seminars in which the first half of each session involved a presentation by a psychiatrist or psychologist about eating disorders, dieting behaviours, or physiological changes associated with puberty. The remainder of the session involved open group discussion regarding body image concerns and the importance of physical appearance. At one year follow-up, girls in the treatment condition who were identified as being at low risk reported reduced body dissatisfaction. Girls identified as being at low risk in the treatment condition also reported an improvement in their attitudes towards binge eating practices from baseline to 12 month follow-up. In contrast, girls identified as being at low risk reported a significant increase in binge eating practices over time in the control condition. However, the program was found to be unsuccessful at changing the attitudes and behaviours of girls most at risk. Unlike Paxton’s study, Santonastaso et al.’s study shows that providing adolescent girls with information regarding eating disorders and associated symptomatology does not encourage unhealthy attitudes to eating and weight regulation at one year follow-up. However, information alone does not seem sufficient to change the attitudes and behaviours of girls most at risk.

In another study incorporating an information-based approach to prevention, Withers et al. (2002) examined the effectiveness of an eating disorders prevention
videotape among grade seven girls. The videotape addressed determinants of body size and shape, sociocultural influences, the negative effects of dieting and eating disorders, healthy eating, and positive body image. One hundred and four girls viewed the videotape while 114 girls acted as the control comparison group. Girls from both the treatment and control conditions completed measures assessing body dissatisfaction, drive for thinness, body image concerns, dieting, and knowledge regarding videotape content at baseline, post-intervention, and one month follow-up. Findings indicated that at post-intervention, girls who viewed the videotape reported positive changes in drive for thinness, dieting, and knowledge of videotape content compared to girls in the control condition. However, at one month follow-up, the findings regarding drive for thinness and dieting had diminished with girls who viewed the videotape reporting greater knowledge than girls in the control condition only. Whilst girls who viewed the videotape reported greater knowledge at one month follow-up, a videotape providing girls with information regarding the negative effects of dieting, eating disorders, and emotional eating was shown to be unsuccessful at changing girls' attitudes and behaviours. This finding is consistent with Santonastaso et al. (1999).

In a more recent study, Abascal et al. (2004) examined the effectiveness of a psychoeducational on-line prevention program with 78 tenth grade girls. Similar to Santonastaso et al. (1999), girls were separated into three groups. One group consisted of girls identified as being at high risk of developing eating disorder symptoms and also motivated to improve their body image. A second group consisted of girls identified as being at low risk of developing eating disorder symptoms and less motivated to improve their body image. A third group was a combined group. Girls completed six weekly 45 minute sessions independently on the computer whereby they would receive information regarding nutrition and eating disorders and participate in on-line discussions with other girls within their group. Results indicated that the program was ineffective at changing the attitudes and behaviour of girls identified at high risk and less motivated. Girls in the high risk and highly motivated group reported significantly improved body shape and weight concerns at post-program follow-up. Girls in the low risk and low motivation group reported significantly improved body shape concerns at post-program follow-up. Girls in the combined group, who were identified as high risk and highly motivated, reported significantly improved body shape concerns, reduced problem eating practices,
and fewer motivations to be thin at post-program follow-up. The findings offer some support for the use of an information-based intervention. However, the impact of the program was not evaluated in comparison to a control condition and the effectiveness of the program was only evaluated in the short term.

The information-based strategy to prevention provides adolescents and young adults with information regarding eating disorder symptomatology and the health risks associated with engaging in problem eating practices. However, the information-based strategy has been criticised as being potentially harmful in terms of increasing girls’ awareness of weight loss practices and methods of food restriction (O’Dea & Abraham, 2000). Paxton’s (1993) information-based intervention was found to increase girl’s body dissatisfaction over a one year period. Prevention efforts which incorporate an information-based approach may increase girls’ awareness of eating disorder symptomatology but attitudes and behaviours regarding weight and shape concerns have been more difficult to change (Paxton, 1993; Withers et al., 2002). This trend is particularly salient for girls identified as being at high risk and less motivated to change.

2.2 The Disease-Specific Pathways Model to Prevention

The disease-specific pathways model, which employs social cognitive theory, has been found to be more successful than an information-based strategy at reducing weight and shape concerns (Phelps, Dempsey, Sapia, & Nelson, 1999; Stice, Mazotti, Weibel, & Agras, 2000; Stice, Trost, & Chase, 2003). Typically, prevention efforts which incorporate the disease-specific pathways model encompass social learning or cognitive behavioural techniques (Killen et al., 1993). Techniques may include, self-monitoring, modelling, and guided practice to encourage teenagers to engage in healthy lifestyle practices, such as regular exercise, and combat against unhealthy lifestyle practices, such as dieting.

Social cognitive theory posits that in order for behaviour change to occur, predisposing factors encompassing environmental influences, personal factors, and self-perceptions must first be studied and understood (Neumark-Sztainer et al., 1995; O’Dea & Abraham, 2000). Environmental influences include knowledge surrounding the use of
media "glamour" techniques. Personal factors encompass one's own values and attitudes. Finally, self-perceptions include body image concerns and motivation to change (O'Dea & Abraham, 2000). The disease-specific pathways model postulates that research examining the relationships between "specific" pathways and weight and shape concerns will provide knowledge for appropriate prevention and intervention (Levine & Smolak, 2001; Stice et al., 2000).

In one study that encompassed social-cognitive theory, Phelps et al. (1999) developed a six session eating disorder prevention program for adolescents and adults. The program included an evaluation of sociocultural influences, clarification of personal values systems, and promotion of resilience factors, including coping skills. Phelps et al. conducted three investigations incorporating an experimental-control design with 1066 grade six to eight students, 312 grade 9 to 11 students and 63 female college students. No evidence to support attitude and behaviour change was found for participants in the youngest age group, which suggests that the program may not have been suitable for early adolescents. However, Phelps et al. found that grade 9 to 11 students' attitudes and beliefs about sociocultural influences, disordered eating practices, and students' future intentions regarding weight control in the treatment group were significantly improved from those in the control group. There were no significant differences between the experimental and control groups with regards to current uses of fasting, exercise dependence, purging, diet aids, water pills, and laxatives as methods of weight control. Results from the post-test female college student population indicated that both current and intended use of fasting, excessive exercise, purging, diet aids, water pills, or laxatives were significantly reduced. In addition, the pre to post-test results of the experimental group from the female college student population was found to have increased physical self-esteem, personal efficacy, and competence and decreased body dissatisfaction at the completion of the program. However, one of the main limitations of the study was that there was no long term follow-up of the impact of the program. Furthermore, no pre-test measures for older students were obtained as participants were randomly assigned to conditions. No pre-test measures were obtained for the control condition of the college sample as Phelps et al. stated that a pre-test measure may sensitise the post-test scores. Moreover, Phelps et al. devised and utilised a scale
assessing future behavioural intentions to evaluate the effectiveness of the program which lacked empirical validity and reliability.

In another study, Stice et al. (2000) devised a three-session dissonance-based targeted preventive intervention, which also encompassed the disease-specific pathways model including the social-cognitive framework. The participants were 30 undergraduate females aged 18 to 22 years who had elevated body image concerns. The targeted intervention was designed to reduce thin-ideal internalisation, body dissatisfaction, dieting, negative affect, and bulimic symptomatology. The dissonance-based program was designed to decrease body image concerns by introducing opposing cognitions or reciprocal determinism encompassed within a social cognitive framework. Participants completed a pre-test, post-test, and one month follow-up questionnaire. The program was found to be successful at decreasing thin-ideal internalisation, body dissatisfaction, dieting, negative affect, and bulimic symptomatology in undergraduate females. These changes remained stable at the one month follow up with the exception of negative affect and bulimic symptomatology (Stice et al., 2000). Whilst the program was successful in the short term, the impact of the program was not evaluated in the long term. Despite the short term success of the program, the sample size was small with only 10 participants in the intervention group.

In a larger and long term follow-up study, Stice et al. (2003) implemented a targeted dissonance-based prevention program aimed at reducing thin-ideal internalisation, body dissatisfaction, dieting, negative affect, and bulimic tendencies with 148 females with a mean age of 17.4 years. High school and college participants with self-reported body dissatisfaction were assigned to one of three conditions: dissonance-based intervention, healthy weight control intervention, or a control condition. Interventions consisted of three weekly one hour sessions. The dissonance-based intervention, incorporating the social-cognitive framework, was similar to that implemented by Stice et al. (2000). The healthy weight intervention encompassed promoting permanent lifestyle changes including consumption of a low fat diet and engagement in regular exercise. Results indicated that the dissonance-based intervention was successful at reducing thin-ideal internalisations and dieting behaviours from baseline to post-program and these results were consistent at six month follow-up. The
dissonance-based program was successful at decreasing body dissatisfaction and bulimic tendencies from baseline to post-program, however, these changes were not sustainable, diminishing at six month follow-up. For the dissonance-based intervention, a reduction in negative affect was found between baseline and three month follow-up only. With regards to the healthy weight intervention, a reduction in dieting behaviour, negative affect, and bulimic tendencies from baseline to post-program was found. These results were consistent at six month follow-up. For the healthy weight intervention, a reduction in thin-ideal internalisations was found between baseline and one month follow-up. However, the healthy weight intervention was not successful at reducing body dissatisfaction.

Despite these positive findings, Stice et al. (2003) also found reductions in dieting behaviour and thin-ideal internalisations for the control condition. For the control condition, a short term reduction in dieting behaviour was found from baseline to one to three month follow-up. For the control condition, a reduction in thin-ideal internalisations was found from baseline to three month follow-up. No long term follow-up at six months was obtained for the control condition. Whilst Stice et al. offer no explanation for the positive changes in the control condition, participants may have been motivated to elicit cognitive and behavioural changes by completing the assessment measures only. Furthermore, control group participants may have engaged in other activities, for example, nutritional education classes at school, which may have elicted cognitive and behavioural improvements.

In contrast, other programs, which have only partially incorporated the social-cognitive framework, have been less successful in modifying weight and shape concerns (Killen et al., 1993; Neumark-Sztainer et al., 1995; Neumark-Sztainer, Story, Hannan, & Rex, 2003). For example, Killen et al. implemented an intervention program, which employed social-cognitive theory and information-based strategies designed to modify dieting behaviours and binge eating in 967 girls aged 11 to 13 years. Based on past research, the program was developed using three guiding principles. Firstly, education surrounding the harmful effects of unhealthful weight regulation was provided. Secondly, the program was designed to promote more healthy weight regulation practices by dietary and nutrition education and via physical activity. Finally, the
program was designed to equip girls with the relevant coping skills required to overcome sociocultural pressures of thinness and dieting in Western societies. The program consisted of 18 sessions and incorporated five major assumptions: weight gain is a normal and necessary part of pubertal growth in females; excessive caloric restriction is not an effective long-term weight control strategy; caloric restrictions may actually potentiate weight deregulation; adolescents can learn to counteract the cultural pressures promoting dieting and a thin body ideal; and adolescents can be trained to adopt more healthful nutrition practices and physical activity regimes. The results indicated that whilst girls’ knowledge in the intervention group increased, eating attitudes and unhealthy weight regulation practices did not differ between the control group and the intervention group at post-program. However, the program may not have been as effective at eliciting behaviour change due to the employment of information-based strategics to help reduce weight regulation and dieting practices. The information-based strategy to prevention may have undermined the social-cognitive aspects of the program. An information-based strategy to prevention is very structured and less interactive with written information provided (Paxton, 1993). The information-based approach may have superceded the interactive and life skills approach of the disease-specific pathways model.

In another study, Neumark-Sztainer et al. (1995) also only partially adopted a social cognitive framework, which targeted environmental, personal, and behavioural factors and the relationship among the factors in order to change behaviour. Neumark-Sztainer et al. implemented and evaluated a school-based primary prevention program designed to decrease eating disturbances, including unhealthy dieting and binge eating practices, in 341 tenth grade Israeli girls. The ten-session program was designed to change knowledge, attitudes, and behaviours related to nutrition, weight regulation, and body image and to equip adolescent girls with greater self-efficacy in dealing with social pressures surrounding the notions of dieting and restricted eating. Girls in the treatment and control conditions completed assessment measures at baseline, six month, and two year follow-up. The program was found to be successful at increasing nutritional knowledge, regulating meal patterns, and increasing the amount of physical exercise of girls in the treatment condition at the six month follow-up. The program was not found to be successful, however, at reducing body dissatisfaction, self-esteem, attitudes toward
weight loss methods, or food preferences at the six month or two-year follow-up. However, like the study conducted by Killen et al. (1993), the program content, encompassing social-cognitive theory, may have been undermined by the component that involved information-based strategies. This component primarily focused on providing information about nutrition, weight regulation, and dieting practices.

In a more recent study, Neumark-Sztainer et al. (2003) implemented a school-based obesity prevention program with 201 adolescent girls in grades 9 to 12 designed to change girls' physical activity levels, eating patterns, self-perceptions, and BMI. Eighty-nine girls participated in the “New Moves” intervention program consisting of daily sessions for 16 weeks whilst 112 girls acted as a control comparison group. The intervention was embedded in the social cognitive framework and consisted of four weekly physical activity sessions, including strength training, and weekly alternating social support or nutritional guidance sessions. The social support sessions encompassed small group discussions and the nutritional guidance sessions included recording and evaluating eating patterns over a three day period. At post-program there were no significant differences between the treatment and control group on measures pertaining to behaviour change which included physical activity levels; personal factors which included self-worth; and socioenvironmental factors which included parental support. Similarly, at the three month follow-up, the treatment and control conditions differed only with regards to motivation levels and perceived ability to change physical activity levels with girls in the treatment condition reporting higher scores. Consistent with Killen et al. (1993) and Neumark-Sztainer et al. (1995), the information-based strategies incorporated in the “New Moves” prevention program may have undermined the social cognitive framework also encompassed within the program. The information-based component included providing girls with information about nutrition, such as using the food guide pyramid to make healthy food choices. In addition, the “New Moves” program may not have fully incorporated environmental, personal, and self-perception factors, consistent with the disease-specific pathways model, in program content. “New Moves” may have placed a greater emphasis on physical activity and dietary intake with less emphasis on self-perception factors, such as self worth and self acceptance.
The disease-specific pathways model including a social-cognitive framework to prevention has been more successful at reducing weight and shape concerns in adolescent girls and young adult females than an information-based approach (Phelps et al., 1999; Stice et al., 2000; Stice et al., 2003). However, prevention efforts which only partially incorporate the disease-specific pathways model and also include an information-based strategy to prevention have been less successful (Killen et al., 1993; Neumark-Sztainer et al., 1995; Neumark-Sztainer et al., 2003). The social cognitive framework of the disease-specific pathways model may have been undermined by the information-based component of the program. These programs may have focused on providing girls with information regarding nutrition and weight regulation with less emphasis on self-perception factors, such as self-esteem. The information-based approach to prevention is very structured with less interactive discussion and emphasis is placed on providing individuals with information in a written format (Paxton, 1993). This lecture format may be effective at increasing knowledge regarding weight and shape concerns but not at changing attitudes and behaviour.

2.3 The Nonspecific Vulnerability-Stressor Model to Prevention

The nonspecific vulnerability-stressor model posits that it is a lack of skills, for example, lack of coping skills and social support, which may debilitate individuals in terms of increasing vulnerability to early problems and other mental health problems (Levine & Smolak, 2001). The nonspecific vulnerability-stressor model emphasises that there is no one specific pathway between life stressors, such as low self-esteem, and the development of an eating disorder. Programs based on the nonspecific vulnerability-stressor model also emphasise a more collaborative approach to prevention and intervention with teachers and professionals and the target population (Levine & Smolak, 2001). Overall, the paradigm encompasses an integrated approach to prevention and intervention, which aims to prevent life stressors, for example depression and substance use, by teaching life skills, in order for individuals to build resilience against mental illness (Levine & Smolak, 2001).

No programs that have focused exclusively on the nonspecific vulnerability-stressor model were located (Levine & Smolak, 2001). However, some programs have
combined the theoretical frameworks of both the disease-specific pathways model, incorporating social-cognitive theory, and the nonspecific vulnerability-stressor model to reduce risk factors and increase protective factors associated with weight and shape concerns (O’Dea & Abraham, 2000; Wade, Davidson, & O’Dea, 2003). Programs of this nature are believed to be more beneficial in terms of reducing the risk factors associated with weight and shape concerns and building resilience in the teenage years (Levine & Smolak, 2001). Two studies have provided support for this view (O’Dea & Abraham, 2000; Wade et al., 2003).

One such program, which has incorporated both the disease-specific pathways model and the nonspecific vulnerability-stressor model, has been conducted by O’Dea and Abraham (2000). The nine session program was implemented with 470 adolescent boys and girls aged between 11 and 14 years. The sessions were conducted by the classroom teacher and included different educational approaches. This included group work, team work, games, play, and drama. The program was designed to reduce body image concerns and included a “content-free” curriculum allowing students to guide the learning process, build positive self-esteem, acknowledge feedback, and obtain a greater understanding of “self”. Program content included: dealing with stress, building positive self-esteem, discussion of societal stereotypes, positive self-evaluation, improving self image and acknowledging feedback from significant others, discussion of relationship skills, and improving communication skills. The program was found to be successful at increasing positive body image for both adolescent boys and girls and those individuals perceived “at risk”, in terms of exhibiting low self-esteem and high anxiety at post-program. The improvement in body image for boys and girls diminished at the 12 month follow-up. The level of importance placed on social acceptance had decreased for those participants in the treatment condition and increased for those in the control condition at post-program and 12 month follow-up. Physical appearance was found to be more important to participants in the control condition and less important to participants in the treatment condition at 12 month follow-up. The program was, however, not found to be successful at reducing engagement in weight loss behaviours. Overall, the program was found to be successful at increasing positive body image in the short term and reducing the level of importance placed on social acceptance and physical appearance in the long term.
In a more recent study, Wade et al. (2003) included aspects of both the disease-specific pathways model and the non-specific vulnerability-stressor model in evaluating the effectiveness of a media literacy program and a self-esteem program. The media literacy program and the self-esteem program incorporated social-cognitive theory and were designed to reduce risk factors associated with eating disorders. Participants included 86 grade eight boys and girls. Students were allocated to one of three groups: media literacy program, self-esteem program, or control condition. Interventions consisted of five 50 minute sessions and were implemented by male school teachers. The media literacy program included evaluating media messages, outlining the positives and negatives associated with advertising, and general media awareness. The premise underlying the self-esteem program included understanding that every individual is different and the need to combat societal stereotypes. The results indicated that students who completed the media literacy program reported fewer weight concerns than children in the control group at post-program. There was no significant difference between the self-esteem program and the control group with regards to weight concerns at post-program. The post-program findings diminished, however, at three month follow-up. The main limitation of the study was that the impact of the program was not evaluated beyond three months.

Prevention efforts which incorporate both the disease-specific pathways model and the nonspecific vulnerability-stressor model to prevention have been successful at reducing weight and shape concerns in adolescent girls and boys (O’Dea & Abraham, 2000; Wade et al., 2003). Programs which incorporate both the disease-specific pathways model and the nonspecific vulnerability-stressor model to prevention have also been successful at changing weight concerns and attitudes and behaviours related to self-perception factors, such as self-concept and social acceptance (O’Dea & Abraham, 2000; Wade et al., 2003). In one study (O’Dea & Abraham, 2000), the program was found to be successful at increasing positive body image in the short term and reducing the level of importance placed on social acceptance and physical appearance in the long term. In another study (Wade et al., 2003), the program was found to be successful at reducing weight concerns in the short term, however, the long term effectiveness of the program was not evaluated.
2.4 The Empowerment-Relational Model to Prevention

The empowerment-relational model encompasses a more targeted problem population driven perspective incorporating a participatory approach to greater self-learning (Levine & Smolak, 2001; Piran, 1998). Staff, professionals, and participants are encouraged to work in unison to change adverse factors that the target population acknowledge as detrimental to their wellbeing. In particular, the target population identify factors affecting their perceived body image and work to ameliorate body perceptions (Piran, 1998). For example, girls are encouraged to talk and discuss their experiences and emotions pertaining to their own body image and weight concerns. In this way, communication is used to empower the girls and encourage constructive action. Action serves to transform the immediate environment which includes school policies and the overall ethos, and promote greater self-acceptance amongst the girls (Levine & Smolak, 2001; Piran, 1998, 1999).

Piran (1998, 1999) has been the main advocate of the empowerment-relational model with regards to adolescents' and adults' weight and shape concerns. Piran (1998, 1999) designed and implemented an intervention with students from an elite ballet company to reduce preoccupations with body weight and shape. The program involved intensive communication sessions with all members of the dance company in order to change the ethos of the dance company. The program also included education sessions encompassing knowledge surrounding the changing body in puberty, set-point theory, and social theories of body weight and shape. The program was implemented on three separate occasions in 1987, 1991, and 1996. The main finding was that during the 10 year period the prevalence rate of eating disorders in girls aged 10 to 18 years at the ballet company dropped dramatically, from 1.67% to .006%. There was also a significant reduction in the number of girls engaging in weight reduction practices which included binging, vomiting, and use of laxatives (Levine & Smolak, 2001; Piran, 1998). However, the study did not incorporate a control group in order to more formally evaluate the effects attributed to the prevention program.
2.5 Summary and Conclusion

Whilst the three more recent prevention paradigms, disease-specific pathways model, nonspecific vulnerability-stressor model, and the empowerment-rational model, are different, Levine and Smolak (2001) have identified several similarities. Firstly, the discrepancy between the natural diversity of body shapes and sizes and the sociocultural influences of a thin ideal is acknowledged. Secondly, all three paradigms acknowledge sociocultural pressures from family, peers, and the media, and developmental stressors, such as body changes associated with puberty. Thirdly, emphasis is placed on cultural “literacy” training in terms of understanding and critiquing unhealthy media messages. Finally, all three paradigms emphasise the learning of problem solving skills or life skills including greater assertion, and communication skills, which enable children and adolescents to build greater resilience to factors associated with weight and shape concerns.

The review of prevention and intervention initiatives implemented with adolescents and adults illustrates that whilst a number of different models and theoretical frameworks have been employed, only a few programs have been successful at reducing weight and shape concerns (Paxton, 2002a, 2002b). Programs that encompass social-cognitive theory (Phelps et al., 1999; Stice et al., 2000; Stice et al., 2003) or combine the disease-specific pathways model and the nonspecific vulnerability-stressor model (O’Dea & Abraham, 2000; Wade et al., 2003) have been found to be more successful at reducing weight and shape concerns and associated attitudes and behaviour. However, one of the growing views is that the attitudes and behaviours of adolescents and adults may be less amenable to change. Attitudes and behaviour regarding weight and shape concerns may be more “fixed” and stable during adolescence whilst children’s attitudes and behaviours regarding weight and shape concerns may be more amenable to change (Huon, Roncolato, Ritchie, & Braganza, 1997; Kater, Rohwer, & Levine, 2000; McVey & Davis, 2002; Paxton, 1993; Smolak, Levine, & Schermer, 1998a, 1998b). During middle childhood (ages 8 to 12 years), children show marked developments in cognitions, emotions, and social skills (Bork, 2000; Shaffer, 2002). It is also during this period that children begin to become more influenced by media and peer pressures to achieve the ideal body size valued in our society (Ricciardelli et al., 2003). All these
factors suggest that prevention programs which target preadolescent children may be more successful than programs that target adolescents.
Chapter 3. Review of Prevention and Intervention Programs with Preadolescent Populations

The current chapter provides a review of prevention programs developed to reduce weight and shape concerns for preadolescents. As in Chapter 2, the main theoretical framework employed by researchers are outlined. In addition, the main strengths and weaknesses of these studies are highlighted.

3.1 Recent Prevention Programs with Preadolescents

A summary of 10 located studies that have implemented and evaluated prevention programs with preadolescents is given in Table 3.1. The prevention programs have been designed to reduce weight and shape concerns among children. As with adolescents, preadolescent prevention programs may be considered potentially harmful with some children not yet exhibiting weight and shape concerns. Preadolescent prevention efforts may promote and generate greater awareness of weight and shape concerns among children (Smolak & Levine, 1994a; Vander Wal & Thelen, 2000). To minimise harm, more care has been taken to ensure that the content of preadolescent prevention programs is sensitive to this possibility. For example, preadolescent prevention programs tend to be less structured and there is less emphasis on providing children with written information (Kater et al., 2000; Kater, Rohwer, & Londre, 2002; McVey & Davis, 2002; McVey, Davis, Tweed, & Shaw, 2004; Neumark-Sztainer, Sherwood, Coller, & Hannan, 2000).
### Table 3.1
Summary of Prevention Programs Developed for Pre-adolescents

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Program</th>
<th>Model</th>
<th>Length of Program</th>
<th>Sample</th>
<th>Control Condition</th>
<th>Follow-Up</th>
<th>Aims of Program</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huon, Rencolato, Ritchie, and Braganza (1997).</td>
<td>No name</td>
<td>Disease-specific pathways model</td>
<td>Six weekly sessions</td>
<td>100 fifth grade girls aged 10 to 11 years.</td>
<td>None.</td>
<td>Post-program and six-month.</td>
<td>Alter attitudes and beliefs regarding food and body image. Program developed to coincide with current health education to teach girls positive eating practices, provide nutritional knowledge, and encourage positive attitudes toward their bodies, particularly in terms of weight and shape.</td>
<td>50% of girls' reported improved attitudes towards food and eating at completion of the program. Girls' body acceptance, drive for thinness and body dissatisfaction levels changed minimally and girls' nutritional knowledge neither improved nor deteriorated.</td>
</tr>
<tr>
<td>Study</td>
<td>Intervention</td>
<td>Disease-specific Pathways Model and Nonspecific Vulnerability Stressor Model</td>
<td>Ten Sessions</td>
<td>266 Fourth Grade Children</td>
<td>Age</td>
<td>Yes</td>
<td>Post-program only</td>
<td>Description</td>
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<tr>
<td>Smolak, Levine, and Schermer (1998a, 1998b).</td>
<td>Eating For Me.</td>
<td>Disease-specific pathways model and nonspecific vulnerability stressor model.</td>
<td>Length of sessions set by teacher.</td>
<td>22 girls aged 10 to 12 years.</td>
<td>None</td>
<td>Yes</td>
<td>Post-program only</td>
<td>Provide children with nutritional information and introduce the Food Guide Pyramid. Encourage children to engage in regular physical activity or exercise. Provide children and parents with information regarding the diversity of body shapes and sizes and to enforce positive body image, and encourage healthy eating. Provide children with adequate skills to critically evaluate media messages. With fourth grade children, knowledge regarding fat, nutrition, and the harmful effects of dieting improved. However, the program did not influence self-esteem and exercise or teasing behavior. With fifth grade children, knowledge surrounding healthy eating, exercise and general wellbeing increased however, attitudes and behaviors toward dieting, teasing, eating, exercising or self-esteem remained unchanged.</td>
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<tr>
<td>Coller, Neumark-Sztainer, Bulfer, and Engebretson (1999).</td>
<td>Taste of Food, Fun, and Fitness</td>
<td>Disease-specific pathways model.</td>
<td>Six weekly 90-minute sessions.</td>
<td>22 girls aged 10 to 12 years.</td>
<td>None</td>
<td>Yes</td>
<td>Post-program only</td>
<td>Encourage girls to develop healthy attitudes toward eating, promote physical activity, encourage positive body image, and control of weight in order to prevent maladaptive eating habits. Minimal changes in girls' attitudes and behaviors.</td>
</tr>
<tr>
<td>Kater, Rohwer, and Levine (2000).</td>
<td>Healthy Body Image: Teaching Kids to Eat and Love Their Bodies Too!</td>
<td>Disease-specific pathways model nonspecific vulnerability -stressor model.</td>
<td>Ten sessions.</td>
<td>166 grade four and 56 grade six</td>
<td>None.</td>
<td>Post-program only.</td>
<td>Enable children to critically evaluate the unrealistic media messages, understand the determinants of body size and weight, develop healthy exercise and eating patterns, and encourage children to develop their own identity in terms of competencies and self-acceptance rather than &quot;image&quot;.</td>
<td>Positive changes with regards to understanding body development, attitudes toward body size, knowledge regarding the factors that influence body shape and size, awareness of their own body image and greater critical awareness of media messages.</td>
</tr>
<tr>
<td>Study</td>
<td>Interventions</td>
<td>Sample Size</td>
<td>Duration</td>
<td>Design</td>
<td>Interventions Goals</td>
<td>Outcomes</td>
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<td>Neumark-Sztainer</td>
<td>Free To Be Me. Disease-specific pathways model and nonspecific vulnerability</td>
<td>226 girls</td>
<td>Six 90-minute sessions.</td>
<td>Yes</td>
<td>Promote body acceptance and prevent eating behaviours among preadolescent girls via the enhancement of media literacy and advocacy skills.</td>
<td>Increase in girls' self-efficacy and media-related knowledge. Improvements in body-related knowledge and attitudes upon program completion but were not apparent at follow-up. No change in eating behaviour.</td>
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<tr>
<td>Sherwood, et al.</td>
<td>Disease-specific pathways model.</td>
<td>29 girls</td>
<td>Five 90 minute weekly sessions.</td>
<td>Yes</td>
<td>Address consequences of eating, appraisal of weight and shape, and stereotypes associated with thinness and obesity. Promote self-esteem and body-esteem. Education regarding eating disorders and energy regulation.</td>
<td>Participants in both the treatment and control conditions reported a reduction in eating behaviour. A trend was observed suggesting that treatment condition participants reported an improvement in self-esteem.</td>
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<tr>
<td>Baranowski and</td>
<td>None. Disease-specific pathways model.</td>
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<tr>
<td>Hetherington (2001)</td>
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</table>
Table 3.1 (Continued)

<p>| Katter, Rohwer, and Londre (2002.) | Healthy Body Image: Teaching Kids to Eat and Love Their Bodies Too! | Disease-specific pathways | 11 sessions. | 415 girls and boys aged 9 to 13 years. | Post-program only. | Reduce body weight and shape concerns. Emphasis on positive factors that influence weight, body image and wellbeing such as, increasing physical activity and satisfaction of hunger with wholesome food. Teach sociocultural life skills such as, awareness and interpretation of media messages, influencing body image attitudes. | Girls and boys in the treatment condition reported significant improvements in knowledge of healthy development and eating, media awareness, body size prejudice, self-image and endorsement of desirable lifestyle behaviours at post-program. Significant improvement in control condition also. |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>Body of Theory</th>
<th>干预者</th>
<th>Number of Sessions</th>
<th>Grade</th>
<th>Sex</th>
<th>Study Design</th>
<th>Outcome</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>McVey and Davis (2002).</td>
<td>Every BODY Is a</td>
<td>Disease-specific pathways model and nonspecific vulnerability-stressor model.</td>
<td>6 50 minute sessions.</td>
<td>263 grade 6 girls.</td>
<td>Yes.</td>
<td>One week post-program, six and 12 month.</td>
<td>Promote body satisfaction and self-esteem and prevent problem eating via emphasis on active lifestyle. Media literacy education regarding the dangers of endorsing thinness ideal. Create an awareness of biological influences of body weight and shape and promote acceptance of own body. Employment of stress management techniques to cope with body image concerns.</td>
<td>No program effect. Participants in both the treatment and control conditions reported significant increases in body image and decreases in problem eating behaviours over time.</td>
</tr>
<tr>
<td>McVey, Davis, Tweed, and Shaw (2004).</td>
<td>Every BODY Is a</td>
<td>Disease-specific pathways model and nonspecific vulnerability-stressor model.</td>
<td>6 50 minute sessions.</td>
<td>258 grade 6 girls.</td>
<td>Yes.</td>
<td>One week post-program, six and 12 month.</td>
<td>See McVey and Davis (2002).</td>
<td>Program successful at improving body satisfaction, self-esteem and reducing dieting attitudes at one week post-program only. No long term effects.</td>
</tr>
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</table>
The prevention models outlined in Chapter 2 that have been used to develop adolescent and adult programs parallel the models used in prevention programs implemented with preadolescents. Three programs (Baranowski & Hetherington, 2001; Coller, Neumark-Sztainer, Bulfer, & Engebretson, 1999; Huon et al., 1997) have incorporated the disease-specific pathways model, which emphasises the need to conduct preliminary research prior to the development and implementation of the prevention program in order to determine the risk factors associated with weight and shape concerns in preadolescence. The model also emphasises learning via a social-cognitive framework (Baranowski & Hetherington, 2001; Coller et al., 1999; Huon et al., 1997). The other seven prevention programs (Kater et al., 2000; Kater et al. 2002; McVey & Davis, 2002; McVey, Davis et al., 2004; Neumark-Sztainer et al., 2000; Smolak & Levine, 2001b; Smolak et al., 1998a, 1998b) have emphasised both the disease-specific pathways model and the nonspecific vulnerability-stressor model. These programs emphasise the importance of conducting preliminary research, identifying risk factors and incorporating social-cognitive theory, and include teaching children relevant life skills and building resilience for the later adolescent years.

Programs which have been found to be more effective in reducing children’s weight and shape concerns are those that encompass both the disease-specific pathways model and the nonspecific vulnerability-stressor model. The three studies which incorporated the disease-specific pathways model only, found minimal attitudinal and behavioural changes amongst preadolescents (Baranowski & Hetherington, 2001; Coller et al., 1999; Huon et al., 1997). The disease-specific pathways model does not emphasise the teaching of coping skills and the promotion of protective factors, such as self-esteem, to build resilience against numerous sociocultural pressures and, therefore, may not have been as effective. The seven studies which incorporated both the disease-specific pathways model and the nonspecific vulnerability-stressor model showed improvements in children’s weight and shape concerns (Kater et al., 2000; Kater et al. 2002; McVey & Davis, 2002; McVey, Davis et al., 2004; Neumark-Sztainer et al., 2000; Smolak & Levine, 2001b; Smolak et al., 1998a, 1998b). For example, Smolak et al. (1998a, 1998b) found improvements in children’s knowledge of fat, nutrition, dieting, healthy eating, and exercise compared to comparison counterparts. At a two year follow-up, Smolak and Levine found improvements in children’s knowledge regarding weight
control techniques, nutrition, body esteem, and engagement in weight loss techniques compared to the new control participants. No differences were found between the original treatment and control conditions due to a “spillover” effect whereby knowledge regarding weight and shape concerns were communicated post-program across classrooms and conditions. Kater et al. (2000) found positive changes in children’s attitudes toward body size and awareness of their own body image and greater critical awareness of the use of media glamour techniques. Neumark-Sztainer et al. also found positive changes in girls’ body-related knowledge and attitudes but at post-program only. This finding suggests that booster sessions may be required to sustain the short term effects of the program.

In another study, Kater et al. (2002) found improvements in children’s knowledge of healthy development and eating, media awareness, body size prejudice, self-image, and positive lifestyle behaviours. However, these improvements were also found in the control condition. Children in the control condition may have become more comfortable and familiar with questionnaire items and more accurately reported their weight and shape concerns. Stice and Hoffman (2004) have referred to this as baseline sensitisation. In contrast, children in the control condition may have become bored and frustrated with questionnaire items and completed follow-up measures less accurately. Similar to Kater et al. (2002), McVey and Davis (2002) found no program effect with children in both the treatment and control conditions reporting improved body image and reduced problem eating. In the most recent study, McVey, Davis et al. (2004) found positive short term changes at one week post-program in body satisfaction, self-esteem, and attitudes toward dieting, however, these were not maintained at long term follow-up. This finding suggests that booster sessions or incorporation of the program in school curricula may be required to produce longer term attitudinal and behavioural change.

The studies outlined in Table 3.1, however, have a number of methodological flaws. Three studies lack a control comparison group (Coller et al., 1999; Huon et al., 1997; Kater et al., 2000). Without a control comparison group the effectiveness of the program cannot be fully evaluated. The outcomes of the study cannot be solely attributed to the prevention initiative. Other factors, such as the school ethos or other education programs incorporated within school curricula, may account for the findings.
Two studies included a small sample size (Baranowski & Hetherington, 2001; Coller et al., 1999). Coller et al. implemented the Taste of Food, Fun, and Fitness prevention program with 22 girls, and Baranowski and Hetherington implemented a prevention program with 29 girls. Furthermore, one study included a small comparison control group (Kater et al., 2002). Kater et al. implemented the Healthy Body Image: Teaching Kids to Eat and Love Their Bodies Too! prevention program with 357 children but the control comparison group consisted of 58 children only. Small sample sizes limit the reliability, validity, and generalisability of the findings. Additionally, small sample sizes would render the power of the study too low to be able to detect any treatment effects.

Four studies have utilised questionnaire items that lack empirical validity and reliability (Coller et al., 1999; Huon et al., 1997; Kater et al., 2000; Smolak et al., 1998a, 1998b). For example, Coller et al. did not provide any formal information about assessment measures but stated that the girls completed items related to consumption of snack foods, physical activity, and dieting behaviour. In another study, Huon et al. specifically developed and utilised a seven item baseline and post-program measure of children’s eating attitudes and dieting related behaviours but no evidence for the scales’ validity and reliability was provided. Kater et al. also developed and utilised a 30 item baseline and post-program measure to evaluate children’s attitudinal, emotional, knowledge, understanding, and behavioural changes with regards to weight and shape concerns. However, Kater et al. provided no evidence of the scales’ reliability but reported that the validity of the scale was supported by a panel of experts and pre-tested with a sample of grade four children for comprehension, readability, and thoroughness. Smolak et al. (1998a, 1998b) developed and utilised assessment measures which primarily evaluated learning of curriculum content rather than changes in children’s attitudes and behaviours regarding weight and shape concerns. Scales that lack reliability and validity may not be assessing the construct that the instrument was designed to measure. Also, the instruments developed may not be suitable for young children in terms of reading comprehension and general understanding. In assessing weight and shape concerns amongst children, measures need to be short, due to the distractibility and shorter attention span of children, and use age appropriate language.

In five studies different teachers implemented the program activities which introduces an additional confounding variable (Huon et al., 1997; Kater et al., 2000; Kater et al., 2002; Neumark-Sztainer et al., 2000; Smolak et al., 1998a, 1998b). With different program facilitators the findings of the prevention program may not be attributable to the program itself but to the facilitator. There is also often a lack of universal training of program activities for program facilitators and no strict adherence to program guidelines (Huon et al, 1997; Kater et al., 2000; Kater et al., 2002; Neumark-Sztainer et al., 2000; Smolak et al., 1998a, 1998b). With a lack of unified training and adherence to program guidelines, the findings of the program cannot be attributable to the program content per se but rather may be due to the facilitators' teaching style.

Four of the prevention programs implemented with children also only included an immediate post program follow-up (Coller et al., 1999; Kater et al., 2000; Kater et al., 2002; Smolak et al., 1998a, 1998b). One prevention program included a three month follow-up (Neumark-Sztainer et al., 2000), and four prevention programs included a six month follow-up (Baranowski & Hetherington, 2001; Huon et al., 1997; McVey & Davis, 2002; McVey, Davis et al., 2004). Two prevention programs included a twelve month follow-up (McVey & Davis, 2002; McVey, Davis et al., 2004), and one study was extended to include a 24 month follow-up with additional control condition participants (Smolak & Levine, 2001b). Smolak and Levine extended the study by Smolak et al. (1998a, 1998b) and included 509 children from the original study and 104 new control participants to evaluate the long term effectiveness of the Eating Smart, Eating For Me program and minimise biases associated with repeated questionnaire completion. Prevention programs implemented with preadolescents are designed to prevent weight and shape concerns and equip children with the relevant skills to build resilience prior to adolescence. Without a longitudinal follow-up there is no way to assess whether the program has been successful at preventing weight and shape concerns and effective in producing stable positive changes in attitudes and behaviours.
Finally, six of the ten studies included girls only (Baranowski & Hetherington, 2001; Collier et al., 1999; Huon et al., 1997; McVey & Davis, 2002; McVey, Davis et al., 2004; Neumark-Sztainer et al., 2000). In addition, all four studies including boys in the sample failed to acknowledge and address the sociocultural pressures placed on boys, in relation to muscular definition, in program content or assessment measures (Kater et al., 2002). Both girls and boys have been found to exhibit weight and muscle concerns and are at risk of developing later distorted body image and engaging in problem eating practices. Therefore, programs need to address the problems expressed by both girls and boys. For example, while the media emphasises a slim ideal for females, a more muscular ideal is portrayed for males and program content should reflect this distinction (Grogan & Wainwright, 1996; McCreary & Sassc, 2000; Ricciardelli, McCabe, & Banfield, 2000; Ricciardelli & McCabe, 2001, 2004).

3.2 Summary and Conclusion

Programs incorporating both the disease-specific pathways model and the nonspecific vulnerability-stressor model have been found to be the most effective in reducing children’s weight and shape concerns (Kater et al., 2000; Kater et al., 2002; McVey & Davis, 2002; McVey, Davis et al., 2004; Neumark-Sztainer et al., 2000; Smolak & Levine, 2001b; Smolak et al., 1998a; 1998b). However, too few studies exist which have examined the effectiveness of prevention programs developed for children and most of these studies have serious weaknesses. These weaknesses include: lack of control comparison group, small sample sizes, use of questionnaire items that lack empirical validity and reliability, facilitator biases, lack of longitudinal follow-up, and gender biases.

The ten located studies which have implemented and evaluated preadolescent prevention initiatives have shown some improvements in children’s attitudes and behaviours, however, these improvements often diminished at long term follow-up or the success of the program was not evaluated in the long term. This finding is consistent with studies examining the weight and shape concerns of adolescents and adults whereby limited attitudinal and behavioural changes have been found.
Chapter 4. Three Risk Factors Associated with Weight and Shape Concerns in Preadolescence

Whilst a number of methodological problems exist in many of the prevention programs that have been implemented with children, one of the other weaknesses of past research is that often programs have not directly targeted risk factors which have been shown to be associated with weight and shape concerns among adolescents and/or children. Three risk factors which have been found to be associated with weight and shape concerns among adolescents, and to some extent with children, are social comparisons, negative affect, and self-esteem. A review of these past studies will be provided in this chapter. The chapter also includes a brief section which shows how these three factors are interrelated, and thus the importance of targeting all three factors in one program.

4.1 Social Comparisons

Social comparisons can be defined as the practice whereby individuals compare their own attributes, behaviour, achievements, and understanding with those of others (Durkin, 1995). As children become older they also become keenly aware of how others around them are developing in comparison to oneself. At a pre-school age, children begin to engage in social comparisons with others, primarily peers. It is at this age that children commence engagement in self-socialisation activities with others, such as norm acquisition activities whereby children learn how to behave appropriately within society norms. Pre-school age children are more likely to engage in social comparison practices of a non-evaluative nature (Durkin, 1995). Pre-school age children are typically more interested in the equal distribution of rewards or a desire to be similar to one’s peers rather than how well oneself is progressing compared to others (Durkin, 1995). It is not until children are 7 or 8 years of age, during their early schooling, that they begin to engage in self-evaluative social comparisons whereby individuals compare their own attributes and behaviours with those of others (Durkin, 1995; Ruble, Boggiano, Feldman, & Loebel, 1980). Children have been found to engage in social comparison practices whereby they compare their body and parts of their bodies, such as upper body muscle size, with children and adults of the same sex at 8 to 10 years of age (Holt &
Ricciardelli, 2002). Children may engage in upward or negative social comparisons whereby similar others are perceived as “better off” than one-self contributing to low self-worth (Beck et al., 1979; Durkin, 1995). In contrast, children may engage in downward or positive social comparisons whereby similar others are perceived as “worse off” than one-self contributing to greater self-worth (Durkin, 1995). Therefore, the nature or direction of social comparisons can have a detrimental or ameliorating effect on children and their perceived self-worth.

Festinger (1954) in his Theory of Social Comparison postulated that individuals would compare themselves to others to evaluate themselves and their ideas in contexts in which there are no concrete objective criteria of performance or opinion. In these instances individuals readily compare themselves to stable comparison counterparts that are deemed to be similar to one-self. Social comparisons typically occur if individuals perceive a discrepancy between others’ abilities and one’s own abilities. Social comparisons are less likely to occur if there is little discrepancy between others’ abilities and one’s own (Festinger, 1954). The use of social comparisons whereby individuals compare their own physical appearance, such as body weight, with similar other counterparts has received increasing attention in recent years with body dissatisfaction conceptualized as the norm rather than as the exception. Support for the basis of social comparison theory in describing weight and shape concerns can be illustrated in studies with adolescents and adults. Social comparison theory has been linked to body dissatisfaction, feeling fat, bulimia, and drive for thinness scores (Schutz et al., 1999, 2002; Stormer & Thompson, 1996; Striegel-Moore, McAvay, & Rodin, 1986; Thompson & Heinberg, 1993).

4.2 Social Comparisons and Weight and Shape Concerns in Adolescents and Adults

In adolescent and adult populations, social comparisons have been found to play a role in body dissatisfaction and eating disturbance (Schutz et al., 1999; Schutz, Paxton, & Wertheim, 2002; Stormer & Thompson, 1996). Studies examining the role of social comparisons in relation to the development and maintenance of weight and shape concerns have typically included female adolescents and adults. In recent years, social comparison research has been extended to include males and the role social comparisons
may play in conforming to macho, muscular role models. Studies encompassing adolescent populations will be reviewed first, including two studies with male adolescents. Secondly, studies with adult populations will be reviewed.

Schutz et al. (1999, 2002) investigated social comparisons and targets for social comparisons in 545 adolescent girls from grades 7, 8, and 10. Results indicated that 44% of grade 7 girls, 56% of grade 8 girls, and 64% of grade 10 girls responded at least “sometimes” or greater to the question “Has comparing your body with others ever made you feel as if maybe you ought to diet or lose weight?” In addition, Schutz et al. (1999, 2002) found that 20% of grade 7 girls, 42% of grade 8 girls, and 44% of grade 10 girls responded at least “sometimes” or greater to the question “Has comparing your body with others ever led you to actually start dieting?” Furthermore, findings suggested that engagement in social comparisons increased with age. With increasing age, girls engaged in greater social comparisons of appearance, clothing, fitness, thinness, and general abilities. Girls reported engaging in significantly greater social comparisons with friends than other girls and popular girls, with peers than with family members, and with fashion models than with family members. Consistent with Festinger (1954), Schutz et al. (1999, 2002) found that adolescent girls were more likely to engage in social comparisons with close friends and peers who were deemed stable comparison counterparts similar to one-self, than fashion models or family members.

In another study, Durkin and Paxton (2002) examined body image satisfaction and social comparisons before and after exposure to media images portraying the thin female ideal among 241 adolescent girls in grades 7 and 10. Physical appearance comparisons were found to predict body dissatisfaction scores of grade 10 girls after exposure to media images portraying the thin female ideal. This finding was not found for grade 7 girls or girls in the control condition. This may suggest that girls are not engaging in social comparisons with media ideals until late adolescence. This finding is also consistent with Schutz et al. (1999, 2002) suggesting that adolescents are more likely to engage in social comparisons with peers who are deemed more similar to one-self rather than to models per se.
Two studies were located that have investigated the use of social comparisons among adolescent boys. In one study, Ricciardelli et al. (2000) investigated body image concerns and engagement in body change strategies among 40 adolescent boys aged 12 to 15 years via detailed interviews with participants. Twenty-one of the forty participants reported engaging in social comparisons. Boys reported engaging in social comparisons with their peers, brothers, males with greater muscular definition, media personalities, father, and males with same size muscular definition. Nineteen percent of boys engaging in social comparisons also reported feeling negative about their bodies. These boys typically had a higher BMI and were older. This finding suggests that boys with a higher BMI are more dissatisfied with their bodies which are perceived to be different from the muscular ideal (Kostanski et al., 2004).

Overall, Ricciardelli et al. (2000) found that social comparisons had little impact on boys’ eating patterns. Social comparisons were found to have a greater impact on boys’ exercise patterns with 42.9% of participants indicating that social comparisons would impact on their exercise patterns with regards to changing the size or shape of their bodies. The resulting behaviour for 52.4% of boys was to increase exercise. This is in contrast to girls. The use of social comparisons among girls is more likely to result in greater dieting practices than exercise per se (Schutz et al., 1999, 2002).

In another study including adolescent males, Jones (2001) investigated social comparisons among 215 adolescent girls and 200 adolescent boys from grades 7 and 10. Jones found that both girls and boys were more likely to engage in social comparisons with same sex peers when comparing personal or social attributes of the self, for example, personality, intelligence, and popularity. This finding is consistent with Schutz et al. (1999, 2002). However, both girls and boys were equally likely to engage in social comparisons with same sex peers and models when comparing physical characteristics, for example, shape or build, face, and weight for girls only. Overall, Jones found that greater engagement in social comparisons with either same sex peers or models was associated with greater and more negative body image concerns.

The findings from cross-sectional studies with adolescent populations parallel those found with adult female populations, particularly with regards to the importance
placed on the social comparison target. In 1993, Thompson and Heinberg examined levels of body dissatisfaction, eating disturbance, and social comparisons in 146 female college students. Importance of the social comparison target, for example, family member, friend, or famous celebrity, was found to predict body dissatisfaction. The importance of the social comparison target was also found to predict weight and body size dissatisfaction, and restrictive eating practices in adult women. Additionally, importance of social comparison target was found to predict bulimic tendencies. In another study, Rieves and Cash (1996) examined social comparisons with siblings in relation to body image attitudes and behaviours of 152 female college students. Results indicated that engaging in social comparisons with siblings in preadolescence and adolescence was associated with later body image satisfaction. In preadolescence and adolescence, 19% and 21%, respectively, of female college students reported engaging in negative social comparisons with siblings. Engaging in negative social comparisons may have contributed to negative evaluations of the self with regards to physical appearance and attractiveness. Sibling social comparisons during childhood were found to predict current beliefs regarding the importance, meaning, and effects of appearance on one’s life and negative body image emotions. Furthermore, sibling social comparisons during adolescence were found to predict current appearance related beliefs, negative body image emotions, body satisfaction, and preoccupation with being overweight.

In a more recent study, Van den Berg, Thompson, Obrenski-Brandon, and Coover (2002) examined body image, eating disturbance, and social comparisons in 196 female college students aged 18 to 22 years. Van den Berg et al. found evidence for a mediating effect of social comparisons on the relationship between sociocultural influences and body dissatisfaction. Specifically, results indicated that social comparisons mediated the influence of family and media on body dissatisfaction which, in turn, influenced restrictive eating practices and bulimic tendencies. Social comparisons were also found to mediate the relationship between perfectionism and body dissatisfaction.

Whilst some studies have emphasised the importance of the social comparison target in the development of weight and shape concerns, other studies have examined
social comparisons more generally. Stormer and Thompson (1996) investigated the role of social comparisons and the development of body image disturbance in 162 female college students. Appearance social comparisons encompassing the frequency of engagement in social comparisons was found to predict body size dissatisfaction, body image anxiety, physical appearance dissatisfaction, body dissatisfaction, avoidance coping strategies in relation to physical appearance, restricting eating behaviours, and bulimic tendencies. Overall, Stormer and Thompson found that engaging in social comparisons was a significant predictor of body dissatisfaction and eating disturbance. In addition, Stormer and Thompson found that maturational status, or early pubertal development, was not found to directly predict the onset of body dissatisfaction or eating disturbance but may be mediated by social comparisons. This finding is consistent with Stice and Shaw's (2002) review of the literature, who also found that pubertal development was not directly associated with body dissatisfaction. However, Stormer and Thompson postulated that the developmental nature and effects of teasing and pubertal status may lead to engagement in excessive negative social comparison practices and the development of weight and shape concerns. Congruent with this view, Thompson, Coover, and Stormer (1999) examined the role of social comparisons in relation to body image dissatisfaction and eating disturbance in 173 female undergraduates. Thompson et al. found that appearance based comparisons mediated the effect of social feedback (teasing) on body image and eating disturbance.

In a recent study, Tiggemann and Slater (2004) investigated social comparisons, the influence of the thin female ideal portrayed on television, and body dissatisfaction among 86 women aged 18 to 30 years. The findings indicated that women exposed to music video clips portraying the thin female ideal reported feeling fatter, less confident, less physically attractive, and less satisfied with their bodies than women exposed to non-appearance related video clips. Women exposed to music video clips portraying the thin female ideal reported more social comparisons. Sociocultural pressures regarding the thin female ideal were also found to influence the use of social comparisons and subsequent levels of body dissatisfaction.

Whilst the majority of studies with adults include females, two studies that included both adult females and males were also located. In one study, Fisher, Dunn,
and Thompson (2002) examined the use of social comparisons with regards to physical appearance among 1,760 adolescent and adult males and females from grade seven through to college students. Fisher et al. found that females were more likely to engage in weight related social comparisons with others whilst males were more likely to engage in muscle bulk related social comparisons. This finding suggests that males and females may engage in different cognitive social comparisons with females emphasising thinness and males emphasising muscle bulk. No age differences were found which suggests that social comparisons are stable and may be less amenable to change from early adolescence onwards.

In another study, Botta (2003) examined the relationship between magazine reading, body image concerns, and eating disturbances among 397 adolescents and adults with a mean age of 18.94 years. Females were found to engage in greater social comparisons with magazine models than males. In addition, social comparisons were found to predict increased body satisfaction for females only. For females, social comparisons were found to moderate the relationship between fashion magazine reading and muscularity. Specifically, females who reported comparing their bodies to those that they viewed in magazines, increased reading of fashion magazines was related to decreased muscularity. This finding is consistent with females’ desire for a thin skeletal ideal with little muscular definition. For males, social comparisons were found to moderate the relationship between sports magazine reading and body satisfaction. Therefore, males who reported comparing their bodies to those that they viewed in magazines, increased reading of sports magazines was related to greater body dissatisfaction. The finding suggests that males are dissatisfied with their bodies perceiving a discrepancy between one’s own body and the muscular v-shape ideal frequently presented in today’s media.

The above literature review indicates that engagement in social comparisons by adolescents and adults is associated with the development and maintenance of weight and muscle concerns, such as restrictive eating practices for females and exercise practices for males. The perceived importance of the social comparison target, such as friend or model, has also been found to be associated with weight and muscle concerns. Social comparisons with siblings and peers have been found to play a role in the
development of weight and muscle concerns in adolescence and adulthood. However, in late adolescence and early adulthood, social comparisons with media ideals may play a more significant role. More research, including male participants, is needed to interpret this trend and investigate the direction of social comparisons, which may be either upward or downward, with regards to the development and maintenance of weight and muscle concerns.

4.3 Social Comparisons and Weight and Muscle Concerns in Childhood

Only one study has examined social comparisons in relation to weight and muscle concerns in preadolescence (Holt & Ricciardelli, 2002). Holt and Ricciardelli examined the role of social comparisons in relation to engaging in problem eating practices and muscle preoccupation in 236 boys and girls aged between 8 and 10 years. A similar proportion of boys and girls reported engaging in social comparison practices, however, more boys reported engaging in social comparison practices with adults (29.4% and 23% boys and girls respectively), and more girls reported engaging in social comparison practices with children (32.3% and 34.3% boys and girls respectively). Engaging in social comparison practices with adults was found to be associated with muscle and exercising, sociocultural pressures to eat and preoccupation, and dieting scores for boys. Engaging in social comparison practices with adults was found to be associated with dieting and muscle preoccupation scores for girls. Finally, engaging in social comparison practices with children was found to be associated with sociocultural pressures to eat for girls.

4.4 The Importance of Social Comparisons for Children

Although only one study was located that has examined the role of social comparison practices in relation to children’s weight and muscle concerns (Holt & Ricciardelli, 2002), several studies have shown the importance of social comparisons for children in other behavioural domains. These include self-evaluation, level of ability, information seeking, and academic performance (Butler, 1995, 1996; Ruble et al., 1980; Ruble & Flett, 1988). Ruble et al. investigated social comparisons and the role of self-evaluation in relation to task completion in 104 children from first and second grades. In
terms of self-evaluation, almost no first grade children and only a small number of second grade children considered the social comparison information regarding the success or failure of peers when evaluating one’s own performance. These findings suggest that children do not begin to engage in self-evaluative social comparison practices until middle childhood. In a second study by Ruble et al., 90 children from kindergarten, second, and fourth grades completed a task and were asked to make a competence-based decision in relation to social comparison information received regarding peers’ performance. Consistent with the previous findings, only the fourth grade children utilized the social comparison information in respect to making a competence-based decision. Ruble et al. suggest that prior to 7 or 8 years of age, children focus on the simple mastery of tasks and are generally more interested in “joining in” with others rather than engaging in cognitive processes of self-evaluation (Durkin, 1995).

Ruble and Flett (1988) investigated goal resolution involved in self-evaluation processes, either autonomous or social comparisons, in relation to cognitive developments in 144 boys and girls. Children were in second, fourth, or sixth grade representing low, medium, and high levels of arithmetic ability. Children were given the opportunity to evaluate themselves, either autonomously or via social comparisons. High ability children were found to engage in greater autonomous comparisons and these practices increased with age. This finding supports Festinger’s (1954) notion that individuals only engage in social comparisons if they perceive a discrepancy between their own abilities and others. High ability children are self-confident and hence, engage in autonomous comparisons. On the other hand, Ruble and Flett found that low and medium ability children engaged in greater social comparisons and these practices remained constant across all ages. Low and medium ability children lack self-confidence and hence, engage in social comparisons to evaluate their performance. These findings suggest that children engage in self-evaluation processes to determine their ability in contexts in which there are no concrete objective criteria of performance or opinion (Festinger, 1954).

In another study, Butler (1995) examined information seeking, including self-improvement and self-evaluative processes, in children’s attention to peers’ work with
133 children aged 9 to 11 years. Butler found that children who reported engaging in self-improvement, that is, to evaluate one's own work and decide whether to initiate change, did in fact engage in behaviour to change one's work, such as seeking out additional ideas or inspiration for work initiatives. Whilst children who reported engaging in self-evaluation, that is, to evaluate whether one's own work is better or worse than peers, were less likely to engage in self-improvement activities and more inclined to engage in alternative activities, unrelated to the task at hand. These findings are consistent with Ruble and Flett (1988) suggesting that confident children are more likely to engage in self-improvement activities and children who lack confidence are more likely to engage in self-evaluative processes with others. In another study by Butler (1996), self-improvement and self-evaluative motives for observing peers' work with 98 Israeli kindergarten and grade four children were examined. Children were filmed and the footage re-played to children. The footage was paused on two occasions, at the beginning of the task and near task completion, and children were asked to explain why they were observing peers' work. Results indicated that kindergarten children were more likely to engage in self-improvement practices whilst grade four children were more likely to engage in self-evaluative practices. This finding suggests that younger children are more interested in the simple mastery of tasks while older children engage in the cognitive processes of self evaluation (Durkin, 1995; Ruble et al., 1980).

The importance of social comparisons in relation to other behavioural domains, such as academic performance, has been demonstrated. The findings suggest that children do not begin to engage in self-evaluative social comparisons until middle childhood. Older children and children categorised as having "higher ability" have been found to engage in autonomous or self-improvement social comparisons. Younger children have been found to engage in minimal social comparisons. However, children of "lower ability" have been found to engage in self-evaluative social comparisons in order to evaluate their performance to similar others.

Only one study to date has examined the relationship between social comparisons and weight and muscle concerns among children (Holt & Ricciardelli, 2002), however, this relationship has been extensively studied with adolescent and adult populations. As social comparisons are well entrenched by the time children reach
adolescence and there is increasing evidence of their value during childhood, targeting social comparisons in any prevention work with preadolescents is clearly of high importance.

4.5 Negative Affect

Another variable which has been found to be associated with the weight and shape concerns of children, adolescents, and adults, is negative affect. Negative affect, incorporating both depression and anxiety, has been defined as a general factor of emotional distress encompassing moods, such as sadness, anger, fear, and guilt (Joiner, Catanzaro, & Laurent, 1996; Watson & Clark, 1984; Watson & Tellegen, 1985). Infants develop emotional expression by six months of age and can readily communicate their internal cognitions of happiness, anger, sadness, and fear via facial expressions, vocal expressions, and body language. Unlike other emotions, anger and fear reactions increase in the second half of the first year of life. Self-conscious emotions do not develop until the infant is two years of age. Self-conscious emotions, such as feelings of guilt and being ashamed, develop as an infant's sense of self progresses. Important adult figures play a significant role in the learning of self-conscious emotions or self-awareness. Learning of ineffective coping strategies during emotional self-regulation in infancy may lead to the development of low self-esteem, depression, and antisocial behaviour in later childhood (Durkin, 2003). Children who exhibit negative affect are typically chronically distressed, upset, and have a negative view of one-self (Watson & Clark, 1984).

4.6 Negative Affect and Weight and Shape Concerns in Adolescents and Adults

Like social comparisons, negative affect has been found to be associated with weight and shape concerns in adolescent and adult populations (Leon et al., 1995; Leon, Fulkerson, Perry, Keel, & Klump, 1999; McCabe & Ricciardelli, 2003; Paxton et al., 1999; Pesa, 1999; Stice, 2002; Stice & Shaw, 2002; Thompson & Psaltis, 1988; Wertheim, Koerner, & Paxton., 2001). Studies which examine the role of negative affect in relation to the development of weight and shape concerns have more often
encompassed female adolescent and adult populations, and have less frequently included male counterparts.

Cross-sectional studies with female participants have demonstrated the importance of the relationship between negative affect and weight and shape concerns. In one study, Thompson and Psaltis (1988) investigated body image, body satisfaction, depression, and eating disturbance with 123 female college students aged 17 to 25 years. Results indicated that level of depression was correlated with one's degree of eating disturbance and global body dissatisfaction. In another study, Paxton et al. (1999) examined the role of friendship and peer influences with regards to body image concerns, problem eating practices, and weight loss behaviours in 523 grade 10 girls. Paxton et al. found that friendship groups high in negative affect were also likely to be high in weight loss concerns and binge eating behaviour. Furthermore, girls in the same friendship group reported similar levels of BMI, depression, and self-esteem. In a study by Pesa (1999), psychosocial factors, including depression, were examined among 1,573 dieting and 963 non-dieting adolescent girls in grades 7 to 12. Pesa found that depression was the second largest predictor that differentiated between dieting and non-dieting girls. Thompson and Psaltis (1988), Paxton et al. (1999), and Pesa (1999) did not, however, investigate the relationship between negative affect and weight and shape concerns among male counterparts. Other recent studies suggest that teenage boys are also engaging in "at risk" behaviours, such as exercise practices, to decrease the discrepancy between their current body shape and the ideal muscular body advertised in the media (Ricciardelli et al., 2000; Ricciardelli & McCabe, 2004).

Less research has examined the relationship between negative affect and weight and muscle concerns in male populations. With the recent emphasis on a more muscular male ideal, it may be that adolescent and adult males are exhibiting weight and muscle concerns and engaging in health compromising behaviours, such as taking steroids and engaging in excessive exercise practices, to ameliorate negative affect. McCabe and Ricciardelli (2003) examined the role of sociocultural influences in relation to body image concerns and engaging in body changing strategies among 199 adolescent boys and 267 adolescent girls in grades 7 to 10. For boys, negative affect was found to be associated with body satisfaction, engagement in strategies to increase weight and
muscles, binge eating behaviour, and food supplement use. For girls, negative affect was found to be associated with body satisfaction only. More specifically, there was a univariate effect between negative affect and the other weight and muscle concern measures, however, the sociocultural variables were found to be more important predictors when all variables were examined in multivariate analyses.

During the last decade more literature reviews and longitudinal studies have examined negative affect and weight and shape concerns. In a review of the literature, Stice and Shaw (2002) examined studies from 1980 to 2001 which investigated body satisfaction in relation to the development and maintenance of eating disorder symptomatology among females. Stice and Shaw found that negative affect mediates the relationship between body dissatisfaction and eating disorder pathology. Stice and Shaw summarise that body dissatisfaction leads to increases in negative affect and consequently, to increases in bulimic tendencies. The findings suggest that for some individuals the relationship between body dissatisfaction and negative affect can be detrimental, leading to weight and shape concerns and the development of eating disorder symptomatology. Similarly, in a meta-analytic review Stice (2002) examined risk and maintenance factors associated with eating disorder symptomatology among female children, adolescents, and adults. Stice found that negative affect was related to increases in eating disorder symptomatology and bulimic tendencies. Negative affect was also found to be a causal risk factor for body dissatisfaction and caloric intake. In addition, among individuals with an eating disorder, negative affect was found to be a maintenance factor of binge eating practices.

In a recent longitudinal study, Wertheim et al. (2001) examined predictors of problem eating attitudes and behaviours at baseline and at an eight month follow-up among 435 adolescent girls from grades 7, 8, and 10. Among grade 7 girls, drive for thinness scores and bulimic tendencies at follow-up were found to be predicted by reported levels of negative affect at baseline. For all grade levels, bulimic tendencies measured at baseline were also predicted by negative affect. Wertheim et al. found that girls’ responses remained fairly stable over time with less stability in grade 7 girls’ responses. This may be due to the large number of social, developmental, educational, and physiological changes that occur during this year.
Fewer longitudinal studies exist which examine the relationship between negative affect and weight and shape concerns among males. In one longitudinal study, Leon et al. (1995) investigated risk factors involved in the later development of eating disorders in a three-year study of 1667 adolescent boys and girls. Leon et al. (1995) found that the strongest predictor of risk in year one of the study was a high score of negative affect for both boys and girls. In another longitudinal study by Leon et al. (1999) of 2014 adolescent boys and girls, risk factors, such as negative affect, alcohol consumption, and problem eating practices, associated with the later onset of eating disorders were examined. The only significant risk variable, in a three to four year study of risk factors for the later prevalence of disordered eating in adolescent girls, was that of negative affect. The same relationship existed for boys.

The findings with adolescents and adults suggest that negative affect plays a significant role in the development and maintenance of weight and shape concerns. Research shows that higher levels of negative affect are associated with greater weight and shape concerns (Leon et al., 1995; Leon et al., 1999; McCabe & Ricciardelli, 2003; Paxton et al., 1999; Pesa, 1999; Ricciardelli & McCabe, 2004; Stice, 2002; Stice & Shaw, 2002; Thompson & Psaltis, 1988; Wertheim et al., 2001). The relationship, however, may be bi-directional and more longitudinal studies are required in order to fully understand the role of negative affect as a cause or consequence of weight and shape concerns.

4.7 Negative Affect and Weight and Shape Concerns in Childhood

Whilst the role of negative affect in relation to weight and shape concerns has been primarily investigated with adolescent and adult populations, more recent research has focused on this relationship among preadolescents (Holt & Ricciardelli, 2002; Martin et al., 2000; Ricciardelli et al., 2003). However, few studies include long term follow-ups and examine the bi-directional relationship between negative affect and weight and muscle concerns (Gardner, Stark, Friedman, & Jackson, 2000; Keel, Fulkerson, & Leon, 1997; Martin et al., 2000).
In a cross-sectional investigation, Veron-Guidry et al. (1997) examined the role of negative affect in relation to weight and shape concerns among 148 girls aged 8 to 13 years. The findings indicated that negative affect was found to be associated with eating disorder symptomatology in young girls. Consistent with this finding, Holt and Ricciardelli (2002) examined the role of negative affect in relation to weight and muscle concerns in 236 boys and girls aged between 8 and 10 years. Both boys and girls reported similar levels of negative affect. Negative affect was found to be associated with binging and food preoccupation and social pressure to eat for boys. Negative affect was found to be associated with dieting and muscle preoccupation for girls. In another study, Ricciardelli et al. (2003) examined body image concerns and engagement in body change strategies in 507 children aged 8 to 11 years. Negative affect was found to be associated with the engagement in strategies to decrease weight for boys. Negative affect was also found to be associated with weight importance for girls.

Three longitudinal studies incorporating children were located (Gardner et al., 2000; Keel et al., 1997; Martin et al., 2000). In one longitudinal investigation, Keel et al. examined negative affect, body image, and eating behaviours of 165 grade five and six children over a 12 month period. Longitudinally, negative affect was not found to be related to problem eating attitudes or behaviours in either boys or girls. This may be due to the small sample size of 85 boys and 80 girls and the low power for detecting changes in longitudinal analyses.

In another longitudinal study, Gardner et al. (2000) investigated predictors of engagement in eating disorder practices in 112 boys and 104 girls aged 6, 9, and 12 years over a three year period. Results indicated that negative affect in the second year was found to predict problem eating attitudes and behaviours for both boys and girls a year later. Furthermore, negative affect was found to be the single most important predictor of problem eating attitudes and behaviours for both boys and girls at 10, 11, 13, and 14 years of age. It is important to note that negative affect was not measured initially with 6, 9, or 12 year old participants, therefore, the age at which negative affect may predict problem eating attitudes and behaviours is unknown.
Finally, Martin et al. (2000) conducted a longitudinal investigation over five time periods of negative affect during childhood and the later onset of eating problems or concerns. The sample of 1, 206 children, initially aged four to eight months of age and 11 to 12 years at time five, participated in the study. Results indicated that girls with high drive for thinness and bulimic tendency scores also reported high levels of negative affect. Furthermore, girls who reported high levels of body dissatisfaction also reported high levels of negative affect. No such relationship existed for boys. However, there was a trend for boys who obtained high scores on drive for thinness, body dissatisfaction, and bulimic tendencies to report high levels of negative affect. Longitudinally, girls who reported high drive for thinness scores also reported negative affect from time two, aged 3 to 4 years, onwards. No consistent finding was found for the boys. Martin et al. suggest that children who exhibit negative affect, namely girls, may be more vulnerable, when combined with other risk factors, to engage in later disordered eating patterns. However, while Martin et al. included boys and girls in the study, the investigation failed to incorporate measures more relevant to males such as, muscle bulk and food supplement use. This may explain the inconsistent findings with boys.

The above cross-sectional literature suggests that there is a relationship between children’s negative affect and weight and muscle concerns. Findings from longitudinal studies are less clear. One study found no relationship between negative affect and weight and muscle concerns (Keel et al., 1997), another found no relationship for boys (Martin et al., 2000) and one study found a relationship between negative affect and weight and muscle concerns for both boys and girls (Gardner et al., 2000). Whilst the longitudinal findings are less clear, due in part to methodological biases, there is evidence to suggest that children who exhibit negative affect may be at greater risk of engaging in a range of health compromising behaviours, such as weight and muscle concerns (Gardner et al., 2000; Martin et al., 2000).

Research suggests that a relationship between negative affect and weight and shape concerns among adults and adolescents exists, with increasing support for this relationship among children provided by cross-sectional studies. Therefore, like social comparisons, targeting negative affect in any prevention work with children is of high importance.
4.8 Self-Esteem

In addition to social comparisons and negative affect, self-esteem has also been found to play a role in the development of weight and shape concerns among adults, adolescents, and children (Ricciardelli & McCabe, 2001). Self-esteem is the aspect of self-concept that involves judgements about one’s own worth and feelings associated with those judgements. Self-esteem ranks among the most important aspect of children and adolescents’ socio-cognitive development (Berk, 2000; Shaffer, 2002).

In early childhood, it is believed that children are yet to formulate a sense of self and therefore, typically, children’s self evaluations are unorganised and possess little negativity. Children primarily conceptualise themselves positively via possessions, attributes, and attainments (Durkin, 1995). As children grow and develop both physically and cognitively, an awareness of significant others’ expectations of the self are internalised and a child develops a unique identity. This process begins in middle childhood, around 8 years of age, with the emergence of engaging in social comparison practices to evaluate one’s self-competence. In conjunction with engaging in social comparison practices, children develop emotionally, becoming aware of feelings of pride, achievement, shame, and guilt, not only in relation to oneself but in relation to others (Berk, 2000; Durkin, 1995).

4.9 Self-Esteem and Weight and Shape Concerns in Childhood

Whilst the role of social comparisons and negative affect in relation to weight and shape concerns among children has been studied less extensively, the association between self-esteem and weight and shape concerns is more established. However, the majority of research is cross-sectional with few longitudinal studies. Cross-sectional studies will be reviewed first and three longitudinal studies will be examined next.

Studies examining the relationship between self-esteem and weight and shape concerns among children most often include girls and boys and measures of BMI or
weight. Three studies which have included girls only will be reviewed first. Nine studies which have included both girls and boys will also be reviewed.

In one study by Veron-Guidry et al. (1997) self-esteem and eating disorder symptomatology among 148 girls aged 8 to 13 years was examined. Low self-esteem was found to be associated with eating disorder symptomatology in a sample of preadolescent girls. In another study, Williams and Currie (2000) examined self-esteem and weight and shape concerns in 1,012 girls aged 11 years and 799 girls aged 13 years. In both age groups, girls who were dissatisfied with their weight, thinking that they were too thin or fat, reported lower levels of self-esteem than other girls less dissatisfied with their bodies. For older girls, higher levels of self-esteem were associated with reports of greater perceived attractiveness whilst low levels of self-esteem were associated with reports of less perceived attractiveness. A similar trend emerged for younger girls in relation to perceived attractiveness and self-esteem. Furthermore, for younger girls, the relationship between early pubertal development and low self-esteem was mediated by body dissatisfaction. This relationship was not significant for older girls, although, a similar trend emerged with regards to late pubertal development, low self-esteem, and body dissatisfaction.

In a more recent study, Burrows and Cooper (2002) examined the risk factors associated with the later development of eating disorder symptomatology in 18 normal weight and 18 overweight girls aged 11 to 12 years. Results indicated that overweight girls had greater weight concerns and lower self-esteem, particularly in relation to athletic competence, physical appearance, and global self-worth, than the normal weight counterparts. Burrows and Cooper also found negative correlations between weight, shape, and eating concerns and low self-esteem, particularly with regards to physical appearance, amongst overweight girls only.

Studies which have included only girls have shown that low self-esteem is associated with greater weight and shape concerns. Girls who report high body dissatisfaction have been found to report lower self-esteem (Veron-Guidry et al., 1997; Williams & Currie, 2000). Furthermore, girls categorised as overweight report greater weight and shape concerns and low self-esteem (Burrows & Cooper, 2002).
Nine studies which have included girls and boys were located. In one study, Mendelson, White, and Mendelson (1996) examined the effects of low self-esteem among 379 children aged 8 to 13 years in relation to age, gender, and weight. The results indicated that weight per se did not predict children's self-esteem. With regards to older children in the sample, both boys and girls reported more negative feelings towards their appearance and weight. With respect to the relationship between self-esteem and body-esteem, children who reported fewer appearance concerns were more likely to report higher self-esteem. Similarly, children who reported high levels of self-esteem were more likely to report fewer appearance and weight concerns.

In another study, Flannery-Schroeder and Chrisler (1996) examined weight and shape concerns in relation to body-esteem defined as feelings about the body, amongst 84 boys and girls from grades one, three, and five. Findings indicated that children in all grades were reporting body dissatisfaction and low body-esteem, with fifth grade children reporting the lowest of these scores. No gender differences with respect to body-esteeem were found. However, results indicated that children who reported high levels of weight and shape concerns were also more likely to report low body-esteem. In contrast, Tiggemann and Wilson-Barrett (1998) investigated body satisfaction and self-esteem in 140 children aged 7 to 12 years. The findings indicated that although high levels of body dissatisfaction were correlated with low self-esteem for boys, this relationship was not found for girls. However, the authors concluded that this finding may be due to the fact there was little variation in girls' scores with a high prevalence of body dissatisfaction reported by girls in the sample (Tiggemann & Wilson-Barrett, 1998).

Unlike previous cross-sectional studies, Hill and Pallin (1998) investigated dieting awareness, but not dieting practices per se, and self-esteem among 176 children aged 8 years. The findings suggested that dieting awareness was found to be correlated with low self-esteem. This finding was more pronounced for girls than boys. Furthermore, self-esteem was found to be associated with dieting awareness for girls only. These results suggest that perhaps young boys who exhibit low self-esteem and self-worth do not perceive dieting as a body change strategy and therefore have little
knowledge of the term or consider dieting a feminine practice. Instead, young boys may perceive exercise as a body change practice which is more consistent with achieving their muscular ideal. Hill and Pallin did not include measures assessing exercising awareness which boys exhibiting low self-esteem may more readily identify with.

In another study, Kelly et al. (1999) examined weight and shape concerns amongst 228 grade two and four children. The results indicated that both girls' and boys' dieting behaviours were found to be associated with poorer self-esteem. In boys, low self-esteem was also linked to emotional concerns regarding eating, such as feelings of guilt. Whilst Tiggemann and Wilson-Barrett (1998) found a relationship between self-esteem and body dissatisfaction for boys only, another study provided weak evidence for the relationship between self-esteem and weight and shape concerns for boys or girls. Braet and Wydhooge (2000) examined dietary restraint and self-esteem among 426 children aged 9 to 11 years. The results indicated that weight per se was associated with dietary restraint for both boys and girls but not self-esteem. However, a small correlation between dietary restraint and self-esteem was found.

Inconsistent with Braet and Wydhooge (2000), Thomas et al. (2000) examined self-esteem in relation to weight and muscle concerns amongst 202 boys and girls aged 8 to 10 years and found that self-esteem was related to dieting and restricting and purging acts for girls, and eating problems and sociocultural pressures to eat for boys. Moreover, Ricciardelli et al. (2003) examined body image concerns and engagement in body change strategies in 507 children aged 8 to 11 years. Self-esteem was found to be associated with weight importance scores for boys. Self-esteem was not found to predict body dissatisfaction or cognitive and behavioural aspects of weight or muscle change for girls. This finding is consistent with Tiggemann and Wilson-Barrett (1998). In contrast, a more recent study by Phares, Steinberg, and Thompson (2004) examined the relationship between self-esteem and body image disturbance among 141 boys and girls aged 8 to 11 years. Phares et al. found that body dissatisfaction, bulimic tendencies, and drive for thinness were associated with lower self-esteem for girls. For boys, low self-esteem was found to be associated with body dissatisfaction. However, the findings with boys may reflect low variance on measures, such as drive for thinness, which may not accurately capture boys' weight and muscle concerns.
A limitation of cross-sectional studies is that temporal precedence can not be
determined. Few longitudinal investigations have been implemented to gain a better
understanding of the bi-directional relationship between self-esteem and weight and
shape concerns among children. Three longitudinal studies were located that have
examined this bi-directional relationship. In one study, Keel et al. (1997) conducted a
longitudinal investigation of predisposing risk factors associated with disordered eating
and self-esteem among 165 boys and girls in grades five and six. Results indicated that
self-esteem reported at baseline was not found to be related to disordered eating
practices for boys or girls at the 12 month follow-up. In another longitudinal study,
Gardner et al. (2000) examined eating disorder symptomatology and self-esteem in 216
children aged 6 to 14 years over a three year period. Consistent with Keel et al., self-
estee was not found to be related to eating disorder symptomatology for either boys or
girls aged 6 to 14 years. These findings suggest that low levels of self-esteem during
childhood may not be directly associated with the later development of eating disorder
symptomatology but may play a moderating role. For example, self-esteem may
moderate the relationship between body dissatisfaction and eating disorder
symptomatology. Low self-esteem in preadolescence may make children more
vulnerable to the development of eating disorder symptomatology in adolescence.

In the third longitudinal study located, McGee and Williams (2000) investigated
health compromising behaviours which included eating problems, and levels of self-
estee. Participants included 1037 children who completed measures over seven time
periods beginning at the age of 3 years to the age of 15 years. At age 15 years, 37% of
girls and only 4.9% of boys reported engaging in problem eating practices. Other
findings indicated that problem eating practices increased as a function of age, however,
sself esteem decreased over the same time period. Furthermore, McGee and Williams
found that low levels of self-esteem were associated with a 21% increase in engagement
in multiple compromising health behaviours. These findings may have resulted from
what Stice and Hoffman (2004) refer to as baseline sensitisation. Over the seven testing
periods, children may have become more comfortable with the testing procedure and
more accurately reported their weight and shape concerns. McGee and Williams
conclude, however, that low self-esteem in early childhood precedes the later
engagement in problem eating practices during adolescence. However, additional research is needed to verify McGee and Williams' findings.

A number of cross-sectional and longitudinal studies have found a relationship between children's self-esteem and weight and muscle concerns. However, two studies suggested that this relationship occurred for boys only (Ricciardelli et al., 2003; Tiggemann & Wilson-Barrett, 1998), one study suggested that this relationship existed for girls only (Hill & Pallin, 1998), and one study indicated that this relationship was weak for boys and girls (Braet & Wyderska, 2000). Some studies included girls only (Burrows & Cooper, 2002; Veron-Guidry et al. 1997; Williams & Currie, 2000). The majority of studies showed that the relationship between self-esteem and weight and muscle concerns exists for both boys and girls (Flannery-Schroeder & Chrisler, 1996; Kelly et al., 1999; Mendelson & White, 1982; Mendelson et al., 1996; Phares et al., 2004; Thomas et al., 2000). Longitudinal studies have also produced ambiguous findings with one study suggesting a relationship between low self-esteem and later weight and shape concerns (McGee & Williams, 2000) and two long term studies suggesting that no such relationship exists (Keel et al., 1997; Gardner et al., 2000). Despite ambiguous findings from longitudinal studies, the majority of studies with children suggest that a relationship between self-esteem and weight and shape concerns exists, highlighting the importance of targeting this risk factor in any prevention work in preadolescence prior to adolescence when low self-esteem may be more entrenched.

4.10 Interrelationships among Social Comparisons, Negative Affect, and Self-Esteem

A review of past research which has targeted the three risk factors, social comparisons, negative affect, and self-esteem, in relation to adolescents' and children's weight and shape concerns was provided in this chapter. Whilst the relationships have been shown to be more established by the time children reach adolescence, there is increasing evidence for the same relationships among preadolescents.

The majority of the reviewed studies have also tended to focus on each of the reviewed risk factors in isolation and no study was located which has examined the three
factors in one study. However, there is growing evidence that these factors are interrelated among adults, adolescents, and children.

Past research suggests that social comparisons and negative affect are closely interrelated. A negative view of one-self is often linked to depression and sequentially social comparison practices are associated with the development and maintenance of depression (Flett, Vredenburg, Pliner, & Krames, 1987; Weary, Elbin, & Hill, 1987). Beck et al. (1979) proposed that depressed individuals’ negative self-evaluations and sense of hopelessness are somewhat maintained via negative social comparison practices. Furthermore, it is believed that depressed individuals make more negative social comparisons regarding the self due to their greater tendency to focus on negative life events than their non-depressed counterparts. Non-depressed individuals better cope with negative life events by distracting themselves from the situation and hence, making social comparisons less likely (Ahrens & Alloy, 1997). On the other hand, depressed individuals endeavor to cope with negative life events by thinking about the event and hence, are more likely to engage in social comparison practices or self-evaluative practices with others (Ahrens & Alloy, 1997). As a result, it is believed that depressed individuals tend to interpret social comparison information negatively because they are prone to negative views of the self. In addition, depressed individuals are less likely to find the affirmative information or downward social comparison information which would end their search. Therefore, depressed individuals are more open or aware of social comparison information and make upward rather than downward comparisons congruent with their negative mood (Ahrens & Alloy, 1997; Wood, Michela, & Giordano, 2000).

However, not all the evidence is consistent with this view. Some evidence suggests that depressed individuals are more likely to engage in downward social comparison to self-enhance, in order to cope with their inadequateness and to protect their low level of self-esteem from sinking further (Ahrens & Alloy, 1997; Flett et al., 1987; Wills, 1981; Wood et al., 2000).

The relationship between social comparisons and negative affect in relation to weight and shape concerns has been investigated in only one located study with
adolescents and adults (Green & Saenz, 1995) and only one located study with children (Holt & Ricciardelli, 2002). However, the relationship between social comparisons and negative affect has been studied among adolescents and adults in other domains, such as decision making, and demonstrates the importance of examining these two risk factors together (Flett et al., 1987; Furnham & Brewin, 1988; Klein, 2001; Weary et al., 1987; Weary, Marsh, & McCormick, 1994).

Green and Saenz (1995) investigated problem eating practices in restrained and unrestrained eaters and the role of negative affect and social comparisons in 246 female undergraduates aged 17 to 46 years. Green and Saenz predicted that appearance comparisons would lead to negative affect, low perceived control regarding food intake, and result in problem eating behaviour. The findings of the study were consistent with the predicted model. However, Green and Saenz did not evaluate the direction of appearance comparisons. Green and Saenz assumed that undergraduates engaged in upward social comparisons.

Social comparisons and negative affect have been studied in relation to weight and shape concerns in adolescent and adult populations, however, they have been primarily studied independently of one another. The relationship between social comparisons and negative affect has been supported by research in other areas, such as assessing academic performance, with adolescent and adult populations (Flett et al., 1987; Furnham & Brewin, 1988; Klein, 2001; Weary et al., 1987; Weary et al., 1994). Although the relationship between social comparisons and negative affect in relation to weight and shape concerns among preadolescents has only been investigated in one study (Holt & Ricciardelli, 2002), past research indicates that an interrelationship exists between the two factors in relation to other behavioural areas during childhood and demonstrates the importance of studying these two risk factors in unison (Meyer, Dyck, & Petrinack, 1989; Sacco & Graves, 1984).

Holt and Ricciardelli (2002) examined the relationship between social comparison and negative affect in relation to body dissatisfaction, problem eating, and muscle preoccupation among 236 children aged between 8 and 10 years. Results indicated that social comparison practices with adults and negative affect were found to
be associated with problem eating, exercising, and muscle concern for both boys and girls. In addition, social comparisons with children were found to be associated with problem eating, exercising, and muscle concern for girls only. These findings demonstrate the importance of targeting weight and shape concerns together in future prevention initiatives.

Self-esteem can also influence the accessibility and direction of social comparison practices (Aspinwall & Taylor, 1993; Wheeler & Miyake, 1992; Wood et al., 2000). Individuals with low self-esteem are more likely to think negatively about one-self and are therefore, more likely to engage in upward social comparisons focusing on the superiority of others. On the other hand, individuals with high self-esteem are more likely to think positively about one-self and are therefore more likely to engage in downward social comparison practices to self-enhance. Furthermore, Wood et al. propose that unintentional or unconscious social comparisons may be more influenced by accessibility factors, such as self-esteem. While intentional social comparisons may be more influenced by motivation and self-enhancement.

In the naturalistic investigation conducted by Wood et al. (2000), undergraduate students' self-reports of social comparisons and mood were examined. Wood et al. found that participants who reported negative affect engaged in a greater number of downward social comparison practices to self-enhance. This finding was, however, influenced by the reporting of fewer upward social comparison practices. Wood et al. suggest that perhaps an avoidance of upward social comparison practices leads to self-enhancement rather than greater engagement in downward social comparisons per se.

4.11 Summary and Conclusions

While only a small number of studies have investigated the interrelationship between social comparisons, negative affect, and self-esteem, the findings suggest that these three risk factors are closely interrelated with engagement in social comparisons influenced by negative affect and self-esteem (Aspinwall & Taylor, 1993; Wheeler & Miyake, 1992; Wood et al., 2000). As social comparisons, negative affect, and self-
esteem are closely interrelated, it would be advantageous to target all three factors in future preventative work with both children and adolescents.
PART II. THE “EVERYBODY’S DIFFERENT, NOBODY ELSE IS ME”
PREADOLESCENT PREVENTION PROGRAM

Part II of this thesis provides a description of the development and evaluation of a new prevention program for preadolescents, “Everybody’s Different, Nobody Else Is Me”. Chapter 5 provides a detailed description of the program content. The “Everybody’s Different, Nobody Else Is Me” prevention program was specifically designed to target the three risk factors of social comparisons, negative affect, and self-esteem which have been found to be closely interrelated. In addition, it was designed to address several of the methodological problems identified in previous studies.

A description of the method of the current investigation including a description of the measurement instruments is provided in Chapter 6. The baseline findings are described in Chapter 7 and the immediate post-program effects are examined in Chapter 8. Chapters 9 and 10 provide a summary of the shorter and longer term impact of the prevention program, respectively. Finally, Chapter 11 includes a summary of the effectiveness of the new program. In addition, the findings are compared to previous studies and suggestions for future research are examined.
Chapter 5. The “Everybody’s Different, Nobody Else Is Me” Prevention Program for Preadolescents

5.1 Developmental Framework of Prevention Program

The “Everybody’s Different, Nobody Else Is Me” prevention program has been developed in accordance with the developmental framework described by Levine and Smolak (2001). The developmental framework described by Levine and Smolak encompasses both the disease-specific pathways and the nonspecific vulnerability-stressor models of prevention. The disease-specific pathways model to prevention includes a social-cognitive framework which emphasises targeting predisposing factors, such as environmental or self-perception factors. The non-specific vulnerability-stressor model to prevention focuses on providing children with life skills to prevent the development of mental illness. The “Everybody’s Different, Nobody Else Is Me” prevention program includes both models, emphasising an integrated approach to prevention. The new prevention program has been designed to reduce predisposing factors, such as negative affect, by teaching life skills which include coping skills, in order to prevent weight and muscle concerns amongst children (Levine & Smolak, 2001).

In addition, Levine and Smolak (2001) provide guiding principles for the development and implementation of prevention initiatives. One of the principles refers to the belief that eating problems arise from an interaction between personal vulnerabilities and psychosocial stressors. Personal vulnerabilities include high negative affect and low self-esteem. Psychosocial stressors include perceived pressure to obtain thin or muscular ideals portrayed in the media. The new prevention program has been designed to increase self-esteem and self-confidence by encouraging children to acknowledge positive individual differences and personality characteristics. The three risk factors of social comparisons, negative affect, and self-esteem, have been shown to be interrelated. Individuals who exhibit negative affect may be more likely to engage in upward social comparisons congruent with their negative view of self. However, self-esteem may also influence unintentional or unconscious social comparisons with depressed individuals more likely to engage in downward social comparisons to self-
enhance and protect their low level of self-esteem from sinking further (Wood et al., 2000). An improvement in one risk factor may lead to positive changes in the remaining two risk factors. The new prevention program has been designed to decrease negative affect and improve self-esteem. Furthermore, improved self-esteem and likewise, positive affect, may lead to a reduction in upward social comparisons (Wood et al., 2000). Overall, positive changes in social comparisons, negative affect, and self-esteem are proposed to help prevent the development of weight and muscle concerns among children.

Another of Levine and Smolak’s (2001) guiding principles reflects that the period of transition from childhood to adolescence is a particularly sensitive developmental time. Children experience many changes including physical, emotional, and cognitive changes. Prior to this period of change, it is important to build resilience to combat against engagement in risk taking behaviours, such as dieting, found to be associated with the onset of adolescence (Altabe & Thompson, 1993; Fisher & Thompson, 1998; Paxton et al., 1999; Pesa, 1999; Ricciardelli et al., 2000; Stormer & Thompson, 1996). The new prevention program has been designed to target grade four children aged 9 to 10 years which includes the developmental period prior to adolescence and puberty when many changes occur.

The third principle maintains that peers also play an important role in children’s social and emotional development during late childhood and early adolescence (Levine & Smolak, 2001). In accordance with this principle, the new prevention program considers peer influences and pressures associated with children’s weight and muscle concerns, such as peer group pressure to conform to ideals presented in the media. The new prevention program has also been designed to encourage children to consider the emotional needs of others and minimise peer-related teasing. Furthermore, the new prevention program has been designed to encourage children to think independently, considering positive individual differences and personality characteristics of self and others, rather than physical characteristics. Cognitive changes regarding self and others may lead to a reduction in upward social comparisons of body shape, size, and appearance.
The fourth principle outlined by Levine and Smolak (2001) emphasises the need for understanding and changing the complex factors that guide and influence children, particularly those that play a role in the development of weight and shape concerns. The new prevention program considers social comparisons, negative affect, and self-esteem which have all been found to be associated with weight and shape concerns of children, adolescents, and adults. As a result, the new prevention program has been designed to increase children's self-esteem and self-confidence as well as increase their awareness of others' feelings. In addition to building resilience and creating a healthy lifestyle, the program has been designed to equip children with coping strategies, such as relaxation techniques, and problem solving skills which include increasing communication, which can be applied to a wider context. In accordance with the disease-specific pathways and the non-specific vulnerability-stressor models, the prevention program has been designed to prevent weight and muscle concerns and decrease children's vulnerability to engage in risk taking behaviours, such as dieting, in adolescence.

Levine and Smolak (2001) also acknowledge the importance of conceptualising weight and shape concerns with reference to media body ideals and other potential risk factors, for example depression and anxiety (Levine & Smolak, 2001). The new prevention program has been designed to de-emphasise the notion of engaging in upward social comparisons, focusing on positive self attributes, and incorporates deconstructing media messages. Program activities have been designed to acknowledge the importance of individual differences and different rates of growth and development. Program activities have also been designed to ameliorate psychological wellbeing, for example by encouraging physical activity and promoting effective coping strategies, to combat against psychosocial stressors.

The sixth assumption outlined by Levine and Smolak (2001) emphasises the need to develop and implement prevention programs in childhood as attitudes and beliefs surrounding fitness and social comparisons are not fully developed. For this reason, grade four children were chosen as the target population in the new prevention initiative as their attitudes and behaviours may be more malleable to change than those of adolescents. While negative affect has been found to emerge in early infancy, social
comparisons and self-esteem have both been found to emerge at 7 or 8 years of age and may not, as yet, be fully developed among grade four children.

Finally, Levine and Smolak (2001) emphasise the importance of developing prevention programs that are appropriate for children and their level of cognitive development. At this young age it may be difficult for children to differentiate between thoughts and behaviour, therefore, the new prevention initiative has been designed to teach children about their thoughts and how these influence their behaviour. Consistent with social-cognitive theory, the program activities have been designed to increase children's awareness about their own thoughts and behaviour, and how they influence others. Furthermore, children may be unaware of how they are influenced by the people and media around them. Therefore, the new prevention program has been designed to encourage children to develop their cognitive skills and extend their thinking to a broader context.

In summary, the "Everybody's Different, Nobody Else Is Me" prevention program for preadolescents has been designed to encompass the seven principles of the developmental framework described by Levine and Smolak (2001). In addition, the new prevention program has been designed to specifically target risk factors, such as social comparisons, negative affect, and self-esteem, associated with weight and muscle concerns among children and build resilience prior to adolescence.

5.2 "Everybody's Different, Nobody Else Is Me"

The "Everybody's Different, Nobody Else Is Me" prevention program for preadolescents has been designed to prevent weight and muscle concerns in grade four children. The five-session prevention program has also been designed to increase children's self-esteem and build greater self-confidence via the emphasis on positive individual differences. Program activities have been designed to encourage children to consider the emotional needs of others and employ effective coping strategies, such as relaxation techniques. Program activities have also been designed to teach children problem solving skills which can be applied to broader contexts and promote a healthy lifestyle, both physically and psychologically. A summary of the new five-session
prevention program and the individual objectives of each session is provided in Table 5.1.

<table>
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<th>Table 5.1</th>
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<tr>
<td>&quot;Everybody’s Different, Nobody Else Is Me” Session Objectives</td>
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<tr>
<td><strong>Session 1: “Everybody’s Different, Nobody Else Is Me”</strong></td>
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<td>- Understand the importance of personality characteristics rather than physical appearance.</td>
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<td>- Acknowledge the importance of individual differences and different rates of growth and development.</td>
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<td><strong>Session 2: “Becoming Aware of Your Own Actions &amp; the Effects on Others”</strong></td>
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<td>- Doesn’t matter what someone looks like on the outside, it’s what they’re like on the inside that counts.</td>
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<td>- Awareness of own and others feelings.</td>
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<td>- Understanding the implications of own behaviour on others.</td>
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<td><strong>Session 3: “Healthy Bodies”</strong></td>
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<td>- Acknowledge diversity and variability of body shape and size.</td>
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<td>- Emphasis on positive attributes of self and personality.</td>
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<td><strong>Session 4: “Healthy Mind &amp; Body AND Lots of Fun!”</strong></td>
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<td>- Importance of physical activity.</td>
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<td>- Promotion of effective coping strategies.</td>
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<td>- Importance of relaxation strategies.</td>
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<td><strong>Session 5: “Reflection”</strong></td>
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<td>- Personal and group reflection of past activities and what children have learnt.</td>
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<td>- Application of what learnt in program to everyday life.</td>
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5.3 Session One: "Everybody’s Different, Nobody Else Is Me"

The first session was designed to encourage children to acknowledge the individual differences of people. Emphasis was placed on personality characteristics and academic abilities rather than physical appearance per se. The session was also designed to de-emphasise negative or upward social comparisons via identifying positive self attributes. In addition, program activities were designed to promote self-esteem and positive affect and reduce negative affect, via emphasising strengths of personality and positive self attributes.

A summary of the first session content is given in Table 5.2. Session one included two activities: Individual Differences, and Creation of Sprouting Baby. After completion of the activities, the session concluded with a five-minute discussion about caring for your Sprouting Baby. Group discussion included acknowledgment of different rates of growth and development and the basic requirements for Sprouting Baby including water and sunlight.

5.4 Session Two: "Becoming Aware of Your Own Actions and the Effects on Others"

The second session was designed to encourage children to consider the emotional needs of others and promote positive problem solving. In this session, positive social interactions and play initiatives were encouraged. Self-esteem and positive affect were promoted via consideration of peer networks and discussion of positive individual differences. In addition, the activities promoted an awareness of one’s own actions and the effects of these actions on others to reduce negative affect.

The second session began with a 10 minute review of previous session content. There was discussion regarding individual differences with emphasis on the fact that no two people are the same in terms of physical characteristics and personality attributes. The facilitator enquired about the Sprouting Babies and a discussion regarding different rates of growth and development took place.
Activity 1: Creation of Spinning Board

Outline of First Session, Everybody’s Different, Nobody Else Is Me

Table 5.2
A summary of the second session content is given in Table 5.3. Session two included two activities: Don’t Judge a Book by Its Cover, and Puppet Shows. After completion of the activities, the session concluded with a 10 minute summary. The facilitator initiated a discussion with children that everybody is different and good at different things. Children also discussed the implications of their behaviour on others.

5.5 Session Three: “Healthy Bodies”

The third session was designed to promote positive individual differences and de-emphasise negative or upward social comparisons. In this session, self-esteem and positive affect were promoted by acknowledgment of positive self attributes and the diversity and variability of body shapes and sizes.

As in session two, session three began with 10 minutes of revision including the association between rates of growth and change, individual differences, and how your behaviour affects others and their feelings. A summary of the third session is given in Table 5.4. Session three activities included: Gingerbread Boys and Girls, and Food Sculptures. The third session concluded with a five minute discussion whereby the facilitator encouraged children to talk about what they had learnt about different body shapes and sizes and physical characteristics in relation to personal attributes. Discussion of session content was conducted in unison with the eating of the gingerbread boys and girls.
Table 5.3
Outline of Second Session “Becoming Aware of Your Own Actions and the Effects on Others”

<table>
<thead>
<tr>
<th>Session Aims</th>
<th>Materials</th>
<th>Activity 1. Don’t Judge a Book by Its Cover</th>
<th>Activity 2. Puppet Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote self-esteem and</td>
<td>Story book and</td>
<td>Read book “The Trouble With Mum” by Babette Cole. This book emphasises the distinction between what someone looks like on the outside and what they’re like on the inside. The book also emphasises consideration of others’ feelings (20 minutes).</td>
<td>Children are divided into small groups. Each group is provided with hand puppets and different scenarios. Groups are encouraged to include everybody in the role-plays. Each group provides a different ending to the scenarios.</td>
</tr>
<tr>
<td>positive affect.</td>
<td>Hand puppets.</td>
<td></td>
<td>1. One day, Jack, Emma and Sam were playing in the school playground. Along came Sophie. She approached Jack, Emma and Sam and asked if she could join in with their games. Jack, Emma and Sam replied, “No, you can’t. We’re playing “Mothers and Fathers” and there’s no room for you”. Sophie wandered off sad and upset. How could you change this story so that Sophie doesn’t feel left out and hurt?</td>
</tr>
<tr>
<td>Reduce negative affect.</td>
<td></td>
<td></td>
<td>2. Bill, Tom and Chris were playing football on the school oval when Sarah came along and asked if she could join in. The three boys all looked at each other and smirked. Bill replied, “You can’t play football, you’re a girl”. Sarah stormed off and yelled, “Girls can play football too”. Sarah is right. Everybody is good at doing different things. How could you change this story so that Sarah feels like a member of the football team?</td>
</tr>
</tbody>
</table>

3. One day, a new boy named Andrew arrived at school. He was very quiet and shy. He also had different coloured socks on, his shoes on the wrong feet and his jumper on backwards. What would you and your friends at school say and do to make Andrew feel welcome?

4. In an art class, children were asked to draw a picture of their family. Rebecca and John were sitting on the same table. John took all the textas for himself and wouldn’t share them with Rebecca. When Rebecca asked John for a texta, John replied, “You don’t get any textas
because you can’t draw”. How could this story change so that John realises that he has to share the textas and that he may have hurt Rebecca’s feelings?

5. One day, in a maths class, the teacher asked the children to complete the equation $2 + 3 = ?$

The teacher asked Frank to tell his classmates the answer. Frank said, “$2 + 3 = 6$”. Some children in the class laughed. One boy, named Roger, said, “No dummy, the answer is 5”.

Could Roger have hurt Frank’s feelings? Not everybody is good at maths. How could this story change so that Frank doesn’t feel stupid and silly in front of his classmates? (20 minutes).
Table 5.4
Outline of Third Session “Healthy Bodies”

<table>
<thead>
<tr>
<th>Session Aims</th>
<th>Materials</th>
<th>Activity 1. Gingerbread Boys and Girls</th>
<th>Activity 2. Food Sculptures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote self-esteem and positive affect</td>
<td>Cooking ingredients including: butter, SR flour, golden syrup, sugar, salt, ginger; eggs and decorations (choc bits, 100’s and 1000’s, marshmallows)</td>
<td>Gingerbread dough is made prior to the session. Children are required to wash their hands and wear an apron. Each child is given some dough and asked to make a gingerbread boy or girl. The children are asked to consider different body shapes and sizes and other physical characteristics. Children are also asked to look beyond the physical characteristics of their gingerbread boys and girls and tell their classmates about other attributes of their gingerbread boys and girls. Eg. She makes people laugh and that’s why she is smiling, he is good at sport and that’s why he has muscles etc... (30 minutes).</td>
<td>While the gingerbread boys and girls are cooking, children are invited to make food sculptures. Children are grouped in pairs and, using a variety of food products, are asked to construct an individual. Children are encouraged to think about the diversity and variability of body shapes and sizes. For example, Legs constructed out of spaghetti pasta may represent that the individual has long legs, is tall and good at athletics. Children are reminded that everybody is different and that’s ok (15 minutes).</td>
</tr>
</tbody>
</table>
5.6 Session Four: \textit{"Healthy Mind and Body AND Lots of Fun!"}

The fourth session was designed to promote positive affect and reduce negative affect via physical activity. In addition, children were introduced to relaxation techniques and the use of effective coping strategies to reduce negative affect, such as taking time-out and engaging in pleasurable activities to ameliorate affect.

At the beginning of the fourth session, a 10 minute discussion regarding session three content was conducted. Discussion included the importance of individual differences and variability and diversity of body shape and size. A summary of the fourth session content is given in Table 5.5. Session four activities included: Importance of Exercise, and Relaxation. As with previous sessions, children spent five minutes reviewing what they had learnt after completion of session activities. The facilitator encouraged discussion by asking children if they enjoyed the activities, which activity they enjoyed the most, and why. The facilitator reminded children that people enjoy different activities. Finally, the facilitator encouraged discussion about what children can do to be fit and healthy both in mind and body.

5.7 Session Five: Revision

The fifth session was designed to re-emphasise the promotion of self-esteem and positive affect, and the reduction of negative affect, by asking children to revise the content of past sessions. In particular, the importance of individual differences and positive self attributes rather than physical appearance per se was emphasised to reduce negative or upward social comparisons.
<table>
<thead>
<tr>
<th>Session Aims</th>
<th>Materials</th>
<th>Activity 1. Importance of Exercise</th>
<th>Activity 2. Relaxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote self-esteem and positive affect.</td>
<td>Sporting Equipment.</td>
<td>Children firstly engage in a warm-up including, aerobic-like exercises to music. Eg. Step touch, heel digs, side taps, walking forward and back and stretches. Children engage in different sporting activities. Children rotate around to different activities. Emphasis is placed on fun and developing skill rather than the competitive nature of sport. Sporting activities may include: shooting hoops, kicking soccer ball through goals, balancing a bean bag on head, skipping, etc... Brief warm-down consisting of stretches (30 minutes).</td>
<td>Discuss with children the importance of relaxation or taking time-out. Children participate in a variety of breathing exercises and relaxation techniques. Discuss the importance of using coping strategies in everyday life. For example, when angry or annoyed take time-out to relax via deep breathing or releasing tension in muscles (15 minutes).</td>
</tr>
</tbody>
</table>
At the beginning of the fifth session, a 10 minute discussion of the previous session activities and content was conducted. The importance of physical activity and engaging in relaxation techniques and taking time-out was emphasised by the facilitator. The facilitator encouraged children to participate in class discussion by asking children to share instances of either physical activity or time-out that they had engaged in over the last week with their peers.

A summary of the fifth session content is given in Table 5.6. Session five activities included: Reflection, and Role-Plays. At the end of the revision session, the facilitator summarised the prevention program content and addressed any concerns the children may have expressed.

5.8 Summary and Conclusion

The “Everybody’s Different, Nobody Else Is Me” prevention program was designed using the developmental framework described by Levine and Smolak (2001). The new prevention initiative also incorporates both the disease-specific pathways model and nonspecific vulnerability-stressor model in terms of addressing risk factors and building resilience. The new prevention initiative further targets three risk factors, namely, social comparisons, negative affect, and self-esteem, that have been found to be associated with adults’, adolescents’ and children’s weight and shape concerns.
<table>
<thead>
<tr>
<th>Session Aims</th>
<th>Materials</th>
<th>Activity 1. Reflection</th>
<th>Activity 2. Role-Plays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote self-esteem and positive affect</td>
<td>Paper and pencils; Flower, ball and book.</td>
<td>Firstly, ask children to spend a few minutes thinking about what they have learnt over previous sessions. Ask children to write down what they have learnt. For example, discuss the concept of physical versus personal attributes of individuals, differing rates of growth and development, everybody's different and that's ok, different people are good at different things, your behaviour can impact on others and their feelings, and the importance of having a healthy mind and body. Children may also like to draw a picture accompanying what they have written. Ask children to volunteer to share with their peers what they have learnt (20 minutes).</td>
<td>Ask children to form small groups. Each group is provided with three objects (a flower, a ball, and a book). Groups can choose to use all three objects or just one or two of them in their role-play. In small groups children are asked to develop a role-play based on something they have learnt in the program. For example, taking time-out (reading a book) or inviting a lonely person to join a game of basketball (ball) or cheering somebody up by giving them a flower and letting them know that they are a special person (flower). Children present their role-play to their classmates (25 minutes).</td>
</tr>
</tbody>
</table>
Chapter 6. Method

This chapter provides a description of the method of the current study and includes a description of the measurement instruments.

6.1 Participants

The participants were 156 children (83 boys and 73 girls) recruited from six primary schools located in the eastern suburbs of Melbourne, Australia. Participants were recruited from three State Primary Schools and three Catholic Primary Schools. The six schools were randomly assigned to the two conditions, whilst ensuring that at least one State school and one Catholic school were included in each condition. This resulted in two State Primary Schools and one Catholic Primary School in the control condition, and two Catholic Primary Schools and one State Primary School in the treatment condition. The control condition consisted of 78 children (37 boys and 41 girls) and the treatment condition consisted of 78 children (46 boys and 32 girls). In the control condition, the mean age of the boys was 9.13 years (SD = 0.34) and the mean age of the girls was 9.13 years (SD = 0.42). In the treatment condition, the mean age of the boys was 9.14 years (SD = 0.42) and the mean age of the girls was 9.02 years (SD = 0.35).

The overall attrition rate at six month follow-up was 12.2%. At post-program, four children (one boy and three girls) in the treatment condition and five children (three boys and two girls) in the control condition did not complete the questionnaire. One boy in the treatment condition and nine children (five boys and four girls) in the control condition were away at the one month follow-up. At the three month follow-up, four girls in the treatment condition and five boys and five girls in the control condition did not complete assessment measures. Finally, at the six month follow-up, three children in the treatment condition (one boy and two girls) and 16 children (six boys and 10 girls) in the control condition were away.
6.2 Materials

Positive and Negative Affect

 Negative affect was assessed by the Positive and Negative Affect Schedule for Children (PANAS-C) developed by Joiner et al. (1996). The scale provided a separate assessment of children's level of positive affect (ten items) and children's level of negative affect (ten items). The positive emotions included, "happy", "excited" and "active". The negative emotions included, "upset", "scared", and "angry" (Joiner et al., 1996). Participants were asked to indicate the extent to which they generally experienced each emotion using a five point Likert scale; "very slightly" (1), "a little" (2), "moderately" (3), "quite a bit" (4) and "extremely" (5). Scores pertaining to each subscale ranged from 10 to 50. Higher scores on the positive affect subscale were indicative of greater positive affect while higher scores on the negative affect subscale were indicative of more negative affect.

The PANAS-C possesses moderate internal consistency, good construct validity, and convergent and discriminant validity with preadolescent samples (Crook, Rybiski Beaver, & Bell, 1998; Laurent et al., 1999; Lonigan, Hooe, David, & Kistner, 1999; Wilson, Gullone, & Moss, 1998). Lonigan et al. found moderately high internal consistencies of .68 for positive affect and .81 for negative affect in young children aged 9 to 11 years of age. Furthermore, Holt and Ricciardelli (2002) found high internal consistencies of .75 and .81 for boys and girls, respectively, for negative affect and .78 for positive affect for both boys and girls.

Social Comparison

The Body Comparison Scale (Fisher & Thompson, 1998) and the Social Comparison Questionnaire (Schutz et al., 1999, 2002) were modified to assess the frequency with which children compare their own physical appearance with that of other children, teenagers and adults of the same sex (Holt & Ricciardelli, 2002). The adapted scale consisted of 22 items, with two subscales containing 11 items each. The first subscale included 11 items pertaining to comparing your body with other children of the same sex, and the second subscale included 11 items pertaining to comparing your body with teenagers and adults of the same sex. Both subscales included the same questions.
The first item was a global question which addressed whether children compare their bodies with others. The next seven items pertained to whether children compare particular parts of their bodies with others (for example height, muscle, weight). The next two items explored whether children compare their bodies with counterparts who are deemed to have a better or worse body than themselves. Participants’ responses for the first 10 items were recorded on a five point Likert scale: “never” (1), “rarely” (2), “sometimes” (3), “often” (4), and “very often” (5). The last item examined whether children felt better or worse about their bodies when they compared their bodies with others. Participants’ responses for the last item were also recorded on a five point Likert scale: “a lot better” (1), “a bit better” (2), “no change” (3), “a bit worse” (4), and “a lot worse” (5). Scores ranged from 11 to 55 on each subscale. Higher scores reflected greater engagement in social comparisons.

The overall internal consistency of the Body Comparison Scale is high at 0.96 (Fisher & Thompson, 1998). Test-retest reliability of the Social Comparison Questionnaire is also high with coefficients ranging from .82 to .91 (Schutz et al., 1999, 2002). The internal consistencies of a similar adapted measure of engaging in social comparisons with children aged 8 to 10 years was also high for both boys and girls with .84 and .83, respectively, for the adult subscale. Similarly, internal consistencies were high for both boys and girls with .86 and .83, respectively, for the children subscale (Holt & Ricciardelli, 2002).

For the purpose of this thesis, the two subscales, social comparisons with children and social comparisons with adults, were combined. The two subscales were combined due to a high correlation of .77 between social comparisons with children and social comparisons with adults.

**Body Dissatisfaction**

Child Figure Drawings, developed by Collins (1991), were utilised to assess body dissatisfaction in children. Two separate scales depicting seven male and seven female children arranged in ascending order from thin (1) to obese (7) were employed in the current study. Children were asked to “Place an X under the picture you think looks the most like you look?” (Self), and “Place an X under the picture that shows the way
you want to look?” (Ideal-Self). The difference score calculated between “self” and “ideal-self” ratings on the Child Figure Drawings rating scales was indicative of body dissatisfaction. In order to encapsulate the more muscular ideal of males, silhouettes were modified to emphasise muscular definition in the arms, legs, and chest.

One week test-retest reliability of the Child Figure Drawings with children as young as 8 years of age is high at .79 for current body size and .67 for ideal body size (Vern-Guidry & Williamson, 1996). Wood et al. (1996) found two to three week test-retest reliabilities indicating adequate reliability for current self scores (.70) and ideal-self scores (.63). Finally, criterion-related validity for the scale determined via comparison of pictorial selections and weight and BMI has been provided by Collins (1991). Collins found correlations of .36 between self figure preference and weight, and .37 between self figure preference and BMI.

Self-Esteem

The General-Self subscale of the Self-Description Questionnaire-1 (Marsh, 1990) was utilised to assess children’s self-esteem. Participants reported self-perceptions reflecting individual capabilities and self-satisfaction. Items included “In general, I like being the way I am” and “A lot of things about me are good”. Children responded to items on a five point Likert scale false (1), mostly false (2), sometimes false/sometimes true (3), mostly true (4), and true (5). Scores for the eight item subscale range from 8 to 40. Low scores are indicative of low self-esteem while higher scores are indicative of higher self-esteem. Marsh reported a high internal consistency coefficient of .81 with children in grades two to six. Marsh also reported good construct validity with preadolescent populations.

Dieting

Selected items from the ChEAT developed by Maloney et al. (1988) were employed to assess dieting. For the present study, six of the original items related to dieting practices were retained. Holt and Ricciardelli (2002) and Kelly et al. (1999) found that the six dieting related items were the strongest predictors of dieting behaviours for preadolescent girls. Two items to assess dieting practices from the Body Change Inventory (Ricciardelli McCabe, 2002) were also employed, item 7 “How often
do you change your eating to lose weight?” and item 8 “How often do you exercise to lose weight?” (Ricciardelli et al., 2003). Children responded to items using a six point Likert scale: “always” (6), “very often” (5), “often” (4), “sometimes” (3), “rarely” (2), and “never” (1). Scores range from 8 to 48. Higher scores are indicative of greater problem eating attitudes and behaviours.

Maloney et al. (1988) have found high test-retest reliability (.84 -.88) and internal reliability (.77 -.80) coefficients for the ChEAT among both grade three and four boys and girls. Holt and Ricciardelli (2002) also found moderate to high internal reliability coefficients for grade three and four boys (.63 -.81) and girls (.65 -.83). Furthermore, Kelly et al. (1999) and Smolak and Levine (1994b) provide evidence for the scales’ concurrent and construct validity.

**Muscle Bulk and Exercise**

Eight items based on the ChEAT format were developed to assess muscle bulk and exercise practices. Six items were based on work conducted by Kurtz (1998) and Holt and Ricciardelli (2002). Holt and Ricciardelli found moderate to high factor loadings for the six muscle and exercising items ranging from .45 to .81 for boys, and .50 to .84 for girls. Two new items to assess muscle preoccupation were also included, item 15 “I give too much time and thought to changing my muscles” and item 16 “I think that wanting to change my muscles controls my life”.

Children responded to the items using a six point Likert scale: “always” (6), “very often” (5), “often” (4), “sometimes” (3), “rarely” (2), and “never” (1). Scores range from 8 to 48. Higher scores are indicative of greater muscle bulk and exercise concerns. Holt and Ricciardelli (2002) report high internal reliability coefficients for grade three and four boys (.81) and girls (.73) for the muscle and exercising factor extracted from the modified ChEAT.

6.3 Procedure

Approval was firstly obtained from the Deakin Ethics Committee (Appendix A), the Catholic Education Department (Appendix B) and the Victorian Department of
Education and Training (Appendix C). Sixteen primary schools were sent information packages about the study, which included an invitation to take part in the study (Appendix D). In total, principals from six schools agreed to participate. Information packages, including consent forms, were sent to the parent(s) or legal guardian(s) of all grade four children (Appendices E and F). Children were only allowed to participate in the study if they had returned their signed consent form. The written consent form response rate ranged from 52% to 91% at the different schools, with an average participation rate of 69%.

The control and treatment conditions were implemented concurrently in two phases. In the first phase, two control condition schools and two treatment condition schools completed baseline assessments. The second phase began eight weeks after the initiation of phase one and included one control condition school and one treatment condition school.

Children from both the control and treatment conditions completed a baseline assessment prior to the implementation of the prevention program. One week after the initial completion of the baseline assessment, the treatment condition began the five-session prevention program for one hour a week for five consecutive weeks. At the completion of the new prevention program, children from both the control and treatment conditions completed the assessment measure for a second time. In order to assess the short-term and long-term effects of the “Everybody’s Different, Nobody Else Is Me” prevention program, children in the treatment and control conditions completed the assessment measures at one, three, and six-month follow-ups after the implementation of the prevention program.

Assessments took place in a separate classroom in groups ranging from 16 to 29 children. Children received an introductory letter outlining the purpose of the study (Appendix G) and gave verbal consent to participate. No child refused to take part in the study. Study participation involved children completing a questionnaire booklet (Appendix H) and engaging in program activities. The children were told that the questionnaire booklet was not a test, that there were no right or wrong answers, and that their responses remained anonymous. Children’s questionnaire booklets were
identifiable by code number only and the facilitator was the only person who possessed a list matching code numbers and children's names. Children were also told to be as honest as they could when completing the questionnaire booklet. Children were told that if they wanted to cease participation, they could do so at any time and return to the classroom to join in an alternative activity with their teacher. No child took up this offer.

All questionnaire items were read aloud to facilitate understanding and to address any concerns the children expressed. More difficult words (for example dieting and calories) were defined to ensure that children comprehended the meaning of these words. On completion of the questionnaire booklet on each occasion, each child was measured for height and weight. A tape measure (cm) and weight scales (kg) were utilised to obtain accurate measurements. BMI was calculated for each child using the formula: weight (kg)/ height$^2$ (m). The assessment procedure took approximately 45 minutes to complete.
Chapter 7. Descriptive Data

This chapter provides a description of children’s positive affect, negative affect, social comparisons, body dissatisfaction, self-esteem, dieting, muscle bulk and exercise, and BMI at baseline.

Cronbach alpha reliabilities for all measures assessed at baseline are represented in Table 7.1. Internal consistencies ranged from 0.67 to 0.92 indicating adequate to very good reliability.

Table 7.1
Internal Consistency for Dependent Variables for Boys and Girls

<table>
<thead>
<tr>
<th>Measures</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>0.76</td>
<td>0.71</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>0.83</td>
<td>0.89</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>0.92</td>
<td>0.91</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>0.67</td>
<td>0.79</td>
</tr>
<tr>
<td>Dieting</td>
<td>0.78</td>
<td>0.75</td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>0.82</td>
<td>0.73</td>
</tr>
</tbody>
</table>

7.1 Negative Affect

Table 7.2 displays a summary of boys’ and girls’ responses to items regarding negative affect. Overall, the number of children who reported negative affect frequently was low. This varied from 0% (item- “Bad-tempered”) to 11% (item- “Jumpy”) for girls and from 1% (items- “Upset”, “Scared”, “Bad-tempered”, “Worried”, and “Afraid”) to 12% (item- “Stressed-out”) for boys. In the current investigation a similar proportion of boys and girls reported low levels of negative affect. However a larger proportion of boys (12%) than girls (4%) reported being stressed out “quite a bit or more”. Similarly, a larger proportion of boys (11%) than girls (3%) reported being angry “quite a bit or more”. In contrast, 11% of girls and 8% of boys reported being jumpy “quite a bit or more”. 
On the negative affect scale, the mean scores for boys and girls ($M = 15.67$ and $M = 14.79$, respectively) in the current investigation were slightly lower than past studies with preadolescent populations. Joiner et al. (1996) reported a mean score of 21.51 on the negative affect subscale of the PANAS-C with 116 child and adolescent psychiatric inpatients aged 8 to 16 years. Similarly, with a sample of 228 non-clinical children aged 8 to 15 years, Wilson et al. (1998) reported mean scores on the negative affect subscale of the PANAS-C of 23.17 for boys and 24.86 for girls. In more a recent study, Holt and Ricciardelli (2002) reported a mean score for boys of 17.59 and a mean score of 17.36 for girls on the negative affect scale. This finding suggests that children in the current study had lower levels of negative affect than children in previous studies.

Table 7.2
Summary of Boys’ and Girls’ Responses to Negative Affect Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Moderately&quot;</td>
<td>&quot;Quite a bit to Extremely&quot;</td>
</tr>
<tr>
<td>Stressed out</td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>Upset</td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>Guilty</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Scared</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Angry</td>
<td>13%</td>
<td>11%</td>
</tr>
<tr>
<td>Bad-tempered</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Ashamed</td>
<td>10%</td>
<td>2%</td>
</tr>
<tr>
<td>Worried</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Jumpy</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td>Afraid</td>
<td>0%</td>
<td>1%</td>
</tr>
</tbody>
</table>

7.2 Positive Affect

A summary of children’s responses on items regarding positive affect is displayed in Table 7.3. Overall, children in the current study reported high levels of
positive affect. This varied from 55% (item—“Eager”) to 92% (item—“Happy”) for girls and from 40% (item—“Eager”) to 81% (item—“Active”) for boys. In the current study, a larger proportion of girls (78%) than boys (54%) reported being interested “quite a bit or more”. Similarly, 66% of girls and 42% of boys reported being excited “quite a bit or more”. However, a larger proportion of boys (72%) than girls (64%) reported that they were strong “quite a bit or more”. Similarly, 80% of boys and 66% of girls reported being energetic “quite a bit or more”.

Table 7.3
Summary of Boys’ and Girls’ Responses to Positive Affect Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Moderately” “Quite a bit to”</td>
<td>“Moderately” “Quite a bit to”</td>
</tr>
<tr>
<td></td>
<td>“Extremely”</td>
<td>“Extremely”</td>
</tr>
<tr>
<td>Interested</td>
<td>25% 54%</td>
<td>12% 78%</td>
</tr>
<tr>
<td>Excited</td>
<td>30% 42%</td>
<td>21% 66%</td>
</tr>
<tr>
<td>Strong</td>
<td>15% 72%</td>
<td>22% 64%</td>
</tr>
<tr>
<td>Eager</td>
<td>27% 40%</td>
<td>23% 55%</td>
</tr>
<tr>
<td>Pleased</td>
<td>18% 59%</td>
<td>15% 70%</td>
</tr>
<tr>
<td>Wide-awake</td>
<td>18% 53%</td>
<td>20% 62%</td>
</tr>
<tr>
<td>Energetic</td>
<td>12% 80%</td>
<td>19% 66%</td>
</tr>
<tr>
<td>Happy</td>
<td>17% 75%</td>
<td>4% 92%</td>
</tr>
<tr>
<td>Paying good attention</td>
<td>24% 66%</td>
<td>15% 78%</td>
</tr>
<tr>
<td>Active</td>
<td>13% 81%</td>
<td>14% 73%</td>
</tr>
</tbody>
</table>

Overall, boys and girls in the current study were found to have similar positive affect scores ($M = 37.07$ and $M = 38.83$, respectively). In a study by Wilson et al. (1998) of 228 non-clinical children and adolescents aged 8 to 15 years, boys ($M = 35.10$) and girls ($M = 34.18$) were also found to have similar mean scores on the positive affect subscale of the PANAS-C. The mean scores reported by Wilson et al. were lower than those found in the current study. Similarly, Holt and Ricciardelli (2002) found lower mean scores of 28.80 and 30.83 for boys and girls, respectively, on the positive affect.
scale than in the current study. These results suggest that boys and girls in the current study had higher positive affect, consistent with their lower negative affect mean scores, than children in similar studies.

7.3 Social Comparisons

Table 7.4 and 7.5 display a summary of children's responses on the social comparisons with children and adults scale. Overall, the number of children who reported engaging in social comparisons frequently was low. For social comparisons with children, this varied from 1% (example item- "How often do you compare your muscles to those of other children of the same sex?") to 22% (item- "How often do you compare your height to those of other children of the same sex?") for girls and from 2% (item- "How often do you compare your lower body weight to those of other children of the same sex?") to 27% (item- "How often do you compare your height to those of other children of the same sex?") for boys.

For social comparisons with adults, this varied from 0% (item- "How often do you compare your muscles to those of other adults of the same sex?") to 18% (item- "How often do you compare your height to those of other adults of the same sex?") for girls and from 2% (example item- "Would you describe yourself as someone who compares your body with other adults of the same sex") to 17% (item- "How often do you compare your height to those of other adults of the same sex?") for boys. Consistent with Holt and Ricciardelli (2002), social comparisons with children and adults were reported infrequently by both boys and girls.
Table 7.4  
Summary of Boys' and Girls' Responses to Social Comparisons with Children

<table>
<thead>
<tr>
<th>Item</th>
<th>Boys</th>
<th></th>
<th>Girls</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Sometimes&quot;</td>
<td>&quot;Often to Very Often&quot;</td>
<td>&quot;Sometimes&quot;</td>
<td>&quot;Often to Very Often&quot;</td>
</tr>
<tr>
<td>Would you describe yourself as someone who compares your body with other children of the same sex?</td>
<td>24%</td>
<td>6%</td>
<td>21%</td>
<td>5%</td>
</tr>
<tr>
<td>How often do you compare your weight to those of other children of the same sex?</td>
<td>15%</td>
<td>5%</td>
<td>16%</td>
<td>4%</td>
</tr>
<tr>
<td>How often do you compare your upper body weight to those of other children of the same sex?</td>
<td>10%</td>
<td>4%</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>How often do you compare your lower body weight to those of other children of the same sex?</td>
<td>10%</td>
<td>2%</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>How often do you compare your muscles to those of other children of the same sex?</td>
<td>15%</td>
<td>10%</td>
<td>11%</td>
<td>1%</td>
</tr>
<tr>
<td>How often do you compare your muscle tone of your upper body to those of other children of the same sex?</td>
<td>16%</td>
<td>6%</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>How often do you compare your muscle tone of your lower body to those of other children of the same sex?</td>
<td>15%</td>
<td>6%</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Question</td>
<td>Percentage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you compare your height to those of other children of the same sex?</td>
<td>31%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you compare your body with other children of the same sex who you think have a better body than you?</td>
<td>7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you compare your body with other children of the same sex who you think have a worse body than you?</td>
<td>6%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 7.5
Summary of Boys' and Girls' Responses to Social Comparisons with Adults

<table>
<thead>
<tr>
<th>Item</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would you describe yourself as someone who compares your body</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>your body with other adults of the same sex?</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>How often do you compare your weight to those of other adults of</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>the same sex?</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>How often do you compare your upper body weight to those of other</td>
<td>16%</td>
<td>12%</td>
</tr>
<tr>
<td>adults of the same sex?</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>How often do you compare your lower body weight to those of other</td>
<td>8%</td>
<td>7%</td>
</tr>
<tr>
<td>adults of the same sex?</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>How often do you compare your muscles to those of other adults of</td>
<td>7%</td>
<td>15%</td>
</tr>
<tr>
<td>the same sex?</td>
<td>12%</td>
<td>0%</td>
</tr>
<tr>
<td>How often do you compare your muscle tone of your upper body to</td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td>those of other adults of the same sex?</td>
<td>10%</td>
<td>4%</td>
</tr>
<tr>
<td>How often do you compare your muscle tone of your lower body to</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>those of other adults of the same sex?</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Question</td>
<td>30%</td>
<td>17%</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>How often do you compare your height to those of other adults of the same sex?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you compare your body with other adults of the same sex who you think have a better body than you?</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>Do you compare your body with other adults of the same sex who you think have a worse body than you?</td>
<td>4%</td>
<td>7%</td>
</tr>
</tbody>
</table>
Only a small number of boys and girls reported frequently engaging in social comparisons with children with the exception of height. A larger proportion of boys (58%) than girls (55%) reported engaging in height comparisons with children at least “sometimes”. With regards to weight comparisons, 2% to 15% of boys and 3% to 16% of girls reported engagement in weight comparisons with children at least “sometimes”. With regards to muscle comparisons, between 6% and 16% of boys and between 1% and 11% of girls reported engagement in muscle comparisons with children at least “sometimes”.

With regards to social comparisons with adults, a greater number of children reported engaging in social comparisons with adults than with children. Both boys (20%) and girls (18%) reported comparing themselves to other adults of the same sex at least “sometimes”. Consistent with Holt and Ricciardelli (2002), more boys than girls reported engaging in social comparisons with adults. However, Holt and Ricciardelli reported that a greater number of boys (30%) and girls (23%) reported engaging in social comparisons with adults than in the current study. With regards to weight comparisons, 2% to 16% of boys and 3% to 12% of girls reported comparing their weight to adults of the same sex at least “sometimes”. With regards to muscle comparisons, between 6% and 12% of boys and 0% and 15% of girls reported engaging in muscle comparisons with adults at least “sometimes”. A higher percentage of girls (61%) than boys (47%) reported comparing their height with adults of the same sex at least “sometimes”.

7.4 Body Dissatisfaction

In the current study, a similar number of boys and girls reported being dissatisfied with their body. A larger proportion of girls (16%) than boys (7%) desired a heavier ideal self figure. In contrast, Ricciardelli and McCabe (2001) in a review of the literature found that a smaller proportion of girls (4% to 18%) than boys (13% to 48%) preferred a larger or heavier ideal.
In the current study, a similar proportion of boys and girls (36% and 33%, respectively) preferred a thinner ideal self figure. Typically, in previous studies, a larger proportion of girls than boys have been found to desire a thinner ideal. For example, Collins (1991) found that a greater number of girls (42%) preferred a thinner ideal self figure than boys (30%) in her study of 1118 children with a mean age of 8 years.

The majority of boys (57%) and girls (51%) in the current study, however, reported that they were satisfied with their body. With regards to body weight, 23% of boys and 26% of girls stated that they wanted to lose weight. Similar proportions of boys and girls (5% and 7%, respectively) reported that they wanted to gain weight. A larger proportion of boys (65%) than girls (27%) stated that they wanted to gain muscle. Only small percentages of boys (4%) and girls (3%) reported that they thought that they were fat.

7.5 Self-Esteem

A summary of boys and girls responses to self-esteem items is presented in Table 7.6. Overall, a small number of children reported low self-esteem with the majority of children reporting high self-esteem. This varied from 60% (item- “I do lots of important things”) to 90% (item- “Other people think I am a good person”) for girls and from 51% (item- “I do lots of important things”) to 92% (item- “A lot of things about me are good”) for boys.

In the current study, similar proportions of boys and girls reported high self-esteem. High proportions of boys and girls (89% and 89%, respectively) reported “mostly true to true” to the statement “In general, I like being the way I am”. Similarly, 92% of boys and 88% of boys reported “mostly true to true” to the item “A lot of things about me are good”. High proportions of boys and girls (77% and 81%, respectively) responded “mostly true to true” to the statement “I’m as good as most other people”. These findings suggest that the majority of boys and girls in the sample have high levels of self-esteem.
Table 7.6
Summary of Boys’ and Girls’ Responses to Self-Esteem Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>I do lots of important things</td>
<td>35%</td>
<td>51%</td>
</tr>
<tr>
<td>In general, I like being the way I am</td>
<td>7%</td>
<td>89%</td>
</tr>
<tr>
<td>Overall, I have a lot to be proud of</td>
<td>11%</td>
<td>83%</td>
</tr>
<tr>
<td>I can do things as well as most other people</td>
<td>19%</td>
<td>78%</td>
</tr>
<tr>
<td>Other people think I am a good person</td>
<td>13%</td>
<td>86%</td>
</tr>
<tr>
<td>A lot of things about me are good</td>
<td>8%</td>
<td>92%</td>
</tr>
<tr>
<td>I’m as good as most other people</td>
<td>21%</td>
<td>77%</td>
</tr>
<tr>
<td>When I do something, I do it well</td>
<td>13%</td>
<td>84%</td>
</tr>
</tbody>
</table>

7.6 Dieting

Table 7.7 displays a summary of the boys’ and girls’ dieting practices. Overall, the number of children who reported dieting attitudes and behaviour frequently was low. This varied from 14% (item- “I think about having fat on my body”) to 26% (item- “I have been dieting”) for girls and from 6% (item- “I think about having fat on my body”) to 23% (item- “I eat diet foods”) for boys. Consistent with previous studies, the same dieting attitudes and behaviour were endorsed less frequently by both boys and girls in the current study (Edlund et al., 1996; Holt & Ricciardelli, 2002; Lawrence & Thelen, 1995; Ricciardelli & McCabe, 2001; Rolland et al., 1997).
### Table 7.7
Summary of Boys' and Girls' Responses to Dieting Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am scared about being overweight</td>
<td>12%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>“Sometimes”</td>
<td>“Often to Always”</td>
</tr>
<tr>
<td></td>
<td>8%</td>
<td>21%</td>
</tr>
<tr>
<td>I think a lot about wanting to be thinner</td>
<td>17%</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>11%</td>
<td>19%</td>
</tr>
<tr>
<td>I think about having fat on my body</td>
<td>15%</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>6%</td>
<td>14%</td>
</tr>
<tr>
<td>I stay away from foods with sugar in them</td>
<td>43%</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td>14%</td>
<td>15%</td>
</tr>
<tr>
<td>I eat diet foods</td>
<td>29%</td>
<td>34%</td>
</tr>
<tr>
<td></td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>I have been dieting</td>
<td>19%</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>18%</td>
<td>26%</td>
</tr>
<tr>
<td>How often do you change your eating to lose weight?</td>
<td>25%</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>8%</td>
<td>17%</td>
</tr>
<tr>
<td>How often do you exercise to lose weight?</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>22%</td>
<td>23%</td>
</tr>
</tbody>
</table>

More girls (46%) than boys (20%) reported that they were scared about being overweight at least “sometimes”. Similarly, a greater number of girls (48%) than boys (37%) reported that they had been dieting at least “sometimes”. Forty-six percent of girls and thirty-three percent of boys reported at least “sometimes” changing their eating to lose weight.

Consistent with previous studies, a larger proportion of girls than boys reported engaging in weight control practices (Edlund et al., 1996; Lawrence & Thelen, 1995; Ricciardelli & McCabe, 2001; Rolland et al., 1997). Past research has indicated that between 20% and 56% of girls and between 31% and 39% of boys reported dieting to lose weight (Ricciardelli & McCabe, 2001). In their review of the literature, Ricciardelli and McCabe also found that 44% of boys and 44% of girls reported exercising to lose
weight, and in the current study, 41% of boys and 42% of girls reported engaging in these practices. In contrast, Holt and Ricciardelli (2002) reported that 41% of boys and 43% of girls wanted to be thinner at least “sometimes” whilst only 28% of boys and 35% of girls in the current study reported the same desires. Finally, similar proportions of boys and girls (48% and 57%, respectively) in Holt and Ricciardelli, and in the current investigation (52% of boys and 56% of girls) reported eating diet foods at least “sometimes”.

7.7 Muscle Bulk and Exercise

Table 7.8 displays a summary of children’s responses to the muscle bulk and exercise items. Overall, the number of children who reported engaging in muscle bulk and exercising practices frequently was low. This varied from 3% (example item- “I worry about the size of my muscles”) to 21% (item- “I exercise to become more muscular”) for girls and from 4% (item- “I worry about the size of my muscles”) to 48% (item- “I exercise to become more muscular”) for boys. Consistent with previous studies, the same muscle bulk and exercising practices were endorsed less frequently by both boys and girls in the current study (Holt & Ricciardelli, 2002; Ricciardelli et al., 2003).

Findings from the current study indicate that a larger proportion of boys (76%) than girls (51%) reported exercising to become more muscular at least “sometimes”. A similar proportion of boys and girls (10% and 14%, respectively) reported worrying about the size of their muscles at least “sometimes”. Findings from the current investigation showed that a larger proportion of boys than girls reported engaging in muscle bulk and exercise practices. This finding is consistent with previous research (Holt & Ricciardelli, 2002; Ricciardelli et al., 2003). Consistent with the current study, Holt and Ricciardelli found that 84% of boys and 57% of girls reported that they exercised to become more muscular at least “sometimes”. A similar proportion of boys in the current study to previous studies were found to engage in muscle bulk cognitions. In the study by Holt and Ricciardelli, 57% of boy reported thinking about increasing their muscles when they exercise. In the current investigation, 55% of boys reported thinking about increasing their muscles when they exercise. A larger proportion of girls
in the study by Holt and Ricciardelli than in the current study (47% and 32%, respectively) reported engaging in these cognitions. Finally, Ricciardelli et al. (2003) found that 25% of boys and 20% of girls reported eating special foods to increase muscle bulk “sometimes”. A similar proportion of boys (19%) and girls (19%) in the current investigation reported engaging in the same eating practices to increase muscle bulk.

Table 7.8
Summary of Boys’ and Girls’ Responses to Muscle Bulk and Exercise Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Sometimes”</td>
<td>“Often to Always”</td>
</tr>
<tr>
<td>I exercise to become more muscular</td>
<td>28%</td>
<td>48%</td>
</tr>
<tr>
<td>I eat special foods or food high in calories in order to increase my muscles</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td>I worry about the size of my muscles</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>I think a lot about the muscles on my body</td>
<td>11%</td>
<td>18%</td>
</tr>
<tr>
<td>I think about increasing muscles when I exercise</td>
<td>21%</td>
<td>34%</td>
</tr>
<tr>
<td>I am unhappy about the size of my muscles</td>
<td>13%</td>
<td>5%</td>
</tr>
<tr>
<td>I give too much time and thought to changing my muscles</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>I think that wanting to change my muscles controls my life</td>
<td>6%</td>
<td>8%</td>
</tr>
</tbody>
</table>
7.8 Body Mass Index

Overall the BMI scores of children in the current study were comparable to past studies ranging from 14.18 to 22.97 for boys and from 12.60 to 28.14 for girls. In the current study, the BMI means calculated for boys ($M = 18.05$) and girls ($M = 18.16$) were found to be similar and consistent with other research findings (Holt & Ricciardelli, 2002; Kostanski et al., 2004; Ricciardelli et al., 2003). Holt and Ricciardelli reported that the mean BMI for boys and girls was 16.88 and 17.30, respectively. Similarly, Ricciardelli et al. reported that the mean BMI for boys and girls was 18.63 and 18.25, respectively. Kostanski et al. reported slightly lower mean BMI scores of 16.72 for boys and 16.50 for girls.

One boy and four girls in the current study were found to be overweight with a BMI greater than 22.77 for girls and 22.81 for boys aged 9 years (Cole, Bellizzi, Flegal, & Dietz, 2000). In contrast, one boy and four girls were found to be underweight with a BMI under the tenth percentile rank of 14.2 for girls and 14.4 for boys aged 9 years (National Center for Health Statistics and the National Center for Chronic Disease Prevention and Health Promotion, 2000).

7.9 Summary and Conclusions

In the current study, children were found to report comparable dieting attitudes and behaviours to past studies with few children frequently engaging in these practices (Edlund et al., 1996; Holt & Ricciardelli, 2002; Ricciardelli & McCabe, 2001; Rolland et al., 1997). In contrast, children were found to report higher levels of positive affect and lower levels of negative affect than children in past studies (Joiner et al., 1996; Wilson et al., 1998). Furthermore, children in the current investigation reported infrequent social comparisons and the majority of boys and girls in the sample reported high levels of self-esteem. Consistent with previous studies, a greater proportion of boys than girls were found to engage in muscle bulk and exercise practices (Holt & Ricciardelli, 2002; Ricciardelli et al., 2003). With regards to body dissatisfaction, similar proportions of boys and girls reported being dissatisfied with their body. However, a
larger proportion of girls than boys desired a larger or heavier ideal self figure and a similar proportion of girls and boys desired a thinner ideal self figure. With regards to BMI, children in the current study were found to have comparable scores to previous studies (Holt & Ricciardelli, 2002; Kostanski et al., 2004; Ricciardelli et al., 2003). Only a minority of children were classified as overweight or underweight.
A two-way condition (treatment and control) by gender (boys and girls) multivariate analysis of variance was conducted to examine group differences on the seven dependent variables at baseline. These were negative affect, positive affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction. Table 8.1 provides descriptive data for the dependent variables and BMI by condition and gender at baseline. Missing values, univariate outliers, linearity, and normality were screened according to guidelines provided by Tabachnick and Fidell (2001). A summary of these analyses is provided in Appendix I.

Table 8.1
Descriptive Data for Dependent Variables and BMI by Condition and Gender at Baseline

<table>
<thead>
<tr>
<th>Measures</th>
<th>Treatment Boys Mean (SD)</th>
<th>Treatment Girls Mean (SD)</th>
<th>Control Boys Mean (SD)</th>
<th>Control Girls Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>16.15 (4.54)</td>
<td>14.56 (3.63)</td>
<td>15.28 (4.35)</td>
<td>15.09 (4.11)</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>38.05 (7.52)</td>
<td>39.37 (8.15)</td>
<td>36.27 (6.28)</td>
<td>38.13 (6.95)</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>43.43 (15.28)</td>
<td>41.03 (11.80)</td>
<td>37.99 (9.46)</td>
<td>37.03 (8.99)</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.00 (3.82)</td>
<td>34.04 (4.37)</td>
<td>33.66 (3.57)</td>
<td>34.59 (3.64)</td>
</tr>
<tr>
<td>Dieting</td>
<td>18.41 (6.85)</td>
<td>20.22 (7.02)</td>
<td>16.80 (5.08)</td>
<td>19.17 (5.63)</td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>19.93 (8.51)</td>
<td>15.39 (4.84)</td>
<td>16.35 (4.93)</td>
<td>14.81 (4.80)</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.26 (0.55)</td>
<td>0.21 (0.91)</td>
<td>0.35 (0.88)</td>
<td>0.19 (0.72)</td>
</tr>
<tr>
<td>BMI</td>
<td>17.88 (2.44)</td>
<td>18.12 (2.60)</td>
<td>18.18 (2.01)</td>
<td>18.21 (3.31)</td>
</tr>
</tbody>
</table>
Using Pillai's criterion, the main effect for condition ($\eta^2 (7, 146) = 1.96 \ p > .05$) was not significant indicating that the treatment and control conditions were comparable at baseline. A significant main effect for gender ($\eta^2 (4, 146) = 3.86 \ p < .01$) was identified. Sixteen percent of the variance in the best linear combination of the seven dependent variables is accounted for by gender. The interaction between condition and gender ($\eta^2 (4, 146) = 0.53 \ p > .05$) was not significant.

Examination of univariate effects indicated that two of the seven dependent variables for gender were significant. As summarised in Table 8.2, gender differences were found on muscle bulk and exercise, with boys scoring higher than girls. There was also a significant gender difference on dieting, with girls scoring higher than boys. In both cases, as shown in Table 8.2, the effect sizes were small.

Table 8.2
Main Effect of Gender at Baseline

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Boys</th>
<th>Girls</th>
<th>$F (1,152)$</th>
<th>$p$</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>15.67 (4.43)</td>
<td>14.79 (3.83)</td>
<td>1.74</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>37.07 (6.88)</td>
<td>38.83 (7.62)</td>
<td>1.84</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>40.42 (12.61)</td>
<td>39.28 (10.78)</td>
<td>0.80</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.37 (3.68)</td>
<td>34.28 (4.05)</td>
<td>2.49</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Dieting</td>
<td>17.52 (5.95)</td>
<td>19.76 (6.43)</td>
<td>4.39</td>
<td>.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>17.95 (6.95)</td>
<td>15.14 (4.80)</td>
<td>10.06</td>
<td>.002</td>
<td>0.06</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.31 (0.75)</td>
<td>0.20 (0.83)</td>
<td>0.68</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

8.2 Baseline to Post-Program

A two-way condition (treatment and control) by gender (boys and girls) repeated measures multivariate analysis of variance was conducted to examine group differences on the seven dependent variables. These were negative affect, positive affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction.
Missing values, univariate outliers, linearity, and normality were screened according to guidelines provided by Tabachnick and Fidell (2001) and followed the same procedure as outlined previously in this chapter. A summary of these analyses is provided in Appendix J.

Using Pillai’s criterion, a significant interaction effect between condition and time ($\mathbf{F}(7, 137) = 2.51 \ p < .05, \eta^2 = 0.11$) was found. The main effect for time ($\mathbf{F}(7, 137) = 4.90 \ p = .000, \eta^2 = 0.20$) was also significant. Finally, the main effect for gender ($\mathbf{F}(7, 137) = 6.05 \ p = .000, \eta^2 = 0.24$) was found to be significant. The main effect for condition ($\mathbf{F}(7, 137) = 1.61 \ p = .14$), the interaction effect between condition and gender ($\mathbf{F}(7, 137) = 0.98 \ p = .45$), the interaction effect between time and gender ($\mathbf{F}(7, 137) = 0.84 \ p = .56$), and the interaction effect between time, condition, and gender ($\mathbf{F}(7, 137) = 0.94 \ p = .48$) were all not significant.

Condition by Time Effects

As shown in Table 8.3, there were two significant univariate effects for condition by time. These were for the variables muscle bulk and exercise, and negative affect. Children in the treatment condition showed a more distinct reduction in muscle bulk and exercise than children in the control condition, as can be seen in Figure 8.1. Unexpectedly, children in the treatment condition reported an increase in negative affect while children in the control condition reported a decrease in negative affect, as can be seen in Figure 8.2. Consistent with the increase in children’s negative affect in the treatment condition, there was a trend which showed that children in the treatment condition reported reduced positive affect ($\mathbf{F}(1, 143) = 2.89 \ p = .09, \eta^2 = 0.02$) as can be seen in Figure 8.3.
Table 8.3

Interaction Effect between Condition and Time from Baseline to Post-Program

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Baseline Treatment Mean (SE)</th>
<th>Baseline Control Mean (SE)</th>
<th>Post-Program Treatment Mean (SE)</th>
<th>Post-Program Control Mean (SE)</th>
<th>F(1, 143)</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>15.27 (0.47)</td>
<td>15.13 (0.49)</td>
<td>15.86 (0.53)</td>
<td>14.16 (0.54)</td>
<td>6.39</td>
<td>.01</td>
<td>0.04</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>39.00 (0.85)</td>
<td>37.26 (0.87)</td>
<td>37.04 (0.84)</td>
<td>36.95 (0.86)</td>
<td>2.89</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>42.30 (1.38)</td>
<td>37.81 (1.41)</td>
<td>41.61 (1.48)</td>
<td>36.92 (1.51)</td>
<td>0.02</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.67 (0.44)</td>
<td>34.14 (0.46)</td>
<td>33.18 (0.54)</td>
<td>33.73 (0.55)</td>
<td>0.01</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Dieting</td>
<td>19.61 (0.72)</td>
<td>17.82 (0.74)</td>
<td>18.05 (0.74)</td>
<td>16.79 (0.76)</td>
<td>0.42</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>17.65 (0.70)</td>
<td>15.52 (0.72)</td>
<td>14.25 (0.68)</td>
<td>14.27 (0.69)</td>
<td>5.41</td>
<td>.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.21 (0.09)</td>
<td>0.23 (0.09)</td>
<td>0.22 (0.09)</td>
<td>0.29 (0.09)</td>
<td>0.20</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>
Figure 8.1. Group means of muscle bulk and exercise from baseline to post-program
Figure 8.2. Group means of negative affect from baseline to post-program
Figure 8.3. Group means of positive affect from baseline to post-program
Time Effects

Examination of univariate effects indicated that three of the seven dependent variables for time were significant as shown in Table 8.4. Two of these included muscle bulk and exercise, and positive affect, which have already been discussed as they were moderated by condition. The other effect indicated that children reported lower scores on dieting from baseline to post-program.

Table 8.4
Main Effect of Time from Baseline to Post-Program

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Baseline Mean (SE)</th>
<th>Post-Program Mean (SE)</th>
<th>F(1,143)</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>38.13 (0.61)</td>
<td>36.99 (0.60)</td>
<td>5.49</td>
<td>.02</td>
<td>0.04</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>40.05 (0.98)</td>
<td>39.26 (1.06)</td>
<td>0.99</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.90 (0.32)</td>
<td>33.45 (0.39)</td>
<td>2.10</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Dieting</td>
<td>18.71 (0.52)</td>
<td>17.42 (0.53)</td>
<td>10.18</td>
<td>.002</td>
<td>0.07</td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>16.59 (0.50)</td>
<td>14.26 (0.49)</td>
<td>25.65</td>
<td>.000</td>
<td>0.15</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.22 (0.07)</td>
<td>0.26 (0.06)</td>
<td>0.41</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

Gender Effects

Examination of univariate effects indicated that three of the seven dependent variables for gender were significant as shown in Table 8.5. Results indicated that boys reported higher scores on muscle bulk and exercise, and negative affect than girls. Consistent with their lower scores on negative affect, girls reported higher scores on positive affect than boys. However, these effects were small as evidenced by η².
### Table 8.5
Main Effect of Gender at Post-Program

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Boys</th>
<th>Mean (SE)</th>
<th>Girls</th>
<th>Mean (SE)</th>
<th>F(1,143)</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>15.89 (0.44)</td>
<td>14.32 (0.48)</td>
<td>5.89</td>
<td>.02</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>36.29 (0.75)</td>
<td>38.84 (0.81)</td>
<td>5.31</td>
<td>.02</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Comparison</td>
<td>40.54 (1.28)</td>
<td>38.78 (1.38)</td>
<td>0.88</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.17 (0.43)</td>
<td>34.19 (0.47)</td>
<td>2.58</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dieting Practices</td>
<td>17.24 (0.66)</td>
<td>18.89 (0.71)</td>
<td>2.89</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle Bulk and Exercising</td>
<td>17.14 (0.59)</td>
<td>13.70 (0.64)</td>
<td>15.56</td>
<td>.000</td>
<td>0.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.32 (0.08)</td>
<td>0.16 (0.09)</td>
<td>2.06</td>
<td>ns</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 8.3 Discussion

At post-program, results suggested that the prevention program was only somewhat successful at reducing muscle bulk and exercise in preadolescent children. While children in both the treatment and control conditions reported a reduction in muscle bulk and exercise, children in the treatment condition showed a more distinct reduction. The program was not successful at producing positive changes on the other measures.

It may be that attitudes and behaviours regarding muscle bulk are more amenable to change than other body changing practices, such as dieting to lose weight. This may be because muscle bulk is not as entrenched in Western culture as the slimness ideal and weight loss practices and is therefore more easily influenced. The greater entrenchment of the slimness ideal than the muscular ideal is also supported by previous research with preadolescents. Past studies with children suggest that a greater proportion of girls than boys are reporting body dissatisfaction and engaging in body changing practices, such as dieting, to obtain this slender ideal (Collins, 1991; Edlund et al., 1996; Holt &
Ricciardelli, 2002; Lawrence & Thelen, 1995; Ricciardelli et al., 2003; Rolland et al., 1997; Wood et al., 1996). McCabe and Ricciardelli (2004), in a recent review, found that adolescent boys were exposed to a wider range of acceptable male body shapes and sizes in the media than girls. In contrast, adolescent girls were found to be exposed to a greater number of media messages regarding body weight and shape than adolescent boys (McCabe & Ricciardelli, 2004).

Children in the treatment condition were also found to report an increase in negative affect at post-program whilst children in the control condition were found to report a reduction in negative affect. One factor that may explain this finding may be that children in the treatment condition were disappointed that the program had finished. Many of the children expressed disappointment at not being able to participate in additional activities. Consistent with this finding, a trend showed that children in the treatment condition also reported a reduction in positive affect.

Over time, children in both conditions reported reduced dieting. These findings may reflect baseline sensitisation whereby children may have reported more exaggerated dieting practices when first assessed (Stice & Hoffman, 2004). At baseline, children may have been unfamiliar with questionnaire items, lacked understanding of item content, or complied with the perceived goals of the facilitator. With greater familiarity and understanding of item content, post-program scores may be a more accurate depiction of dieting practices.

Consistent with the short term findings from the current study, Davison et al. (2003) found that girls’ weight and shape concerns decreased over time with repeated measures assessment and did not accurately reflect girls’ attitudes and behaviour. The reduction in children’s dieting may reflect a methodological constraint of repeated measures assessment (Davison et al., 2003). Consistent with Stice and Hoffman (2004), Davison et al. suggest that children may become more comfortable with the assessment procedure and may provide socially desirable responses with repeated measures assessment.
The results also indicated that boys reported higher muscle bulk and exercise scores, higher negative affect scores, and lower positive affect scores than girls. With regards to muscle bulk and exercise, this finding is consistent with baseline scores with boys reporting higher muscle bulk and exercise scores than girls.
Chapter 9. Baseline, Post-Program and One Month Follow-Up: 
Results and Discussion

9.1 Baseline to Post-Program to One Month Follow-Up

A two-way condition (treatment and control) by gender (boys and girls) repeated measures multivariate analysis of variance was conducted to examine group differences on the seven dependent variables across the first three assessments. The dependent variables were negative affect, positive affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction. Missing values, univariate outliers, linearity, and normality were screened according to guidelines provided by Tabachnick and Fidell (2001) and followed the same procedure as outlined previously in Chapter 8. A summary of these analyses is provided in Appendix K.

Using Pillai’s criterion, a significant interaction effect between condition and time \( (F(14,121) = 2.78 \ p < .01, \eta^2 = 0.24) \) was found. The main effect for time \( (F(14,121) = 7.79 \ p = .000, \eta^2 = 0.47) \) was also significant. Finally, the main effect for gender \( (F(7,128) = 6.69 \ p = .000, \eta^2 = 0.27) \) was found to be significant. The other effects: condition \( (F(7,128) = 1.63 \ p = .13) \), interaction between condition and gender \( (F(7,128) = 0.98 \ p = .45) \), interaction between time and gender \( (F(14,121) = 0.89 \ p = .57) \), and interaction between time, condition, and gender \( (F(14,121) = 0.87 \ p = .58) \) were all not significant.

**Condition by Time Effects**

With regards to the interaction between condition by time, examination of univariate effects showed that only one of the seven dependent variables was significant as summarised in Table 9.1. Muscle bulk and exercise was found to be significant in differentiating between baseline, post-program, and one month follow-up scores of the treatment and control conditions. Specific contrasts revealed that muscle bulk and exercise was found to be significant in differentiating between post-program and one month follow-up scores \( (F(1,134) = 13.62 \ p = .000) \) of the treatment and control conditions as illustrated in Figure 9.1.
Table 9.1

Interaction Effect between Condition and Time from Baseline to Post-Program to One Month Follow-Up

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Baseline</th>
<th>Post-Program</th>
<th>One Month Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment Mean (SE)</td>
<td>Control Mean (SE)</td>
<td>Treatment Mean (SE)</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>15.20 (0.48)</td>
<td>15.42 (0.5)</td>
<td>15.64 (0.51)</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>39.16 (0.86)</td>
<td>36.94 (0.92)</td>
<td>37.14 (0.85)</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>42.34 (1.39)</td>
<td>37.47 (1.49)</td>
<td>41.30 (1.42)</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.74 (0.45)</td>
<td>33.93 (0.49)</td>
<td>33.43 (0.53)</td>
</tr>
<tr>
<td>Dieting</td>
<td>19.68 (0.72)</td>
<td>17.63 (0.77)</td>
<td>18.17 (0.73)</td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>17.72 (0.71)</td>
<td>15.50 (0.76)</td>
<td>13.99 (0.61)</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.20 (0.08)</td>
<td>0.27 (0.09)</td>
<td>0.26 (0.08)</td>
</tr>
</tbody>
</table>
Figure 9.1. Group means of muscle bulk and exercise from baseline to post-program to one month follow-up

Children in the control condition showed a reduction in muscle bulk and exercise scores from post-program to one month follow-up. This effect was small, however, as evidenced by $\eta^2 = .09$. In contrast, children in the treatment condition showed similar muscle bulk and exercise scores at post-program and one month follow-up. Muscle bulk and exercise was not found to be significant at differentiating between baseline and one month follow-up scores ($F(1, 134) = 0.17 \ p = .68$) between the treatment and control conditions.
Examination of univariate effects also showed that negative affect approached significance ($F(2, 268) = 2.44, p = .08, \eta^2 = 0.02$). Whilst specific contrasts between baseline and one month follow-up and between post-program and one month follow-up showed no significant differences, results indicated a trend for negative affect. The trend indicated that negative affect differentiated between post-program and one month follow-up scores as illustrated in Figure 9.2. Children in the treatment condition showed a more distinct reduction in negative affect than children in the control condition from post-program to one month follow-up.

![Figure 9.2. Group means of negative affect from baseline to post-program to one month follow-up](image-url)
**Time Effects**

Examination of univariate effects indicated that five of the seven dependent variables for time were significant as shown in Table 9.2. These were negative affect, positive affect, dieting, muscle bulk and exercise, and social comparisons. Two of these effects, muscle bulk and exercise, and negative affect, have already been discussed as they were moderated by condition.

Table 9.2

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Baseline Mean (SE)</th>
<th>Post-Program Mean (SE)</th>
<th>One Month Follow-Up Mean (SE)</th>
<th>F(2,268)</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>15.31 (0.35)</td>
<td>15.08 (0.38)</td>
<td>13.77 (0.33)</td>
<td>14.21</td>
<td>.000</td>
<td>0.10</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>38.05 (0.63)</td>
<td>36.81 (0.62)</td>
<td>36.93 (0.72)</td>
<td>3.64</td>
<td>.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>39.90 (1.02)</td>
<td>38.56 (1.04)</td>
<td>36.67 (0.93)</td>
<td>9.66</td>
<td>.000</td>
<td>0.07</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.84 (0.33)</td>
<td>33.43 (0.39)</td>
<td>33.59 (0.39)</td>
<td>0.82</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Dieting Practices</td>
<td>18.66 (0.53)</td>
<td>17.31 (0.54)</td>
<td>15.28 (0.53)</td>
<td>34.34</td>
<td>.000</td>
<td>0.20</td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>16.61 (0.52)</td>
<td>13.86 (0.45)</td>
<td>12.65 (0.43)</td>
<td>46.04</td>
<td>.000</td>
<td>0.26</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.24 (0.06)</td>
<td>0.29 (0.06)</td>
<td>0.28 (0.06)</td>
<td>0.62</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

Positive affect was found to be significant in differentiating between baseline, post-program, and one month follow-up scores. Specific contrasts revealed that positive affect was found to be significant in differentiating between baseline and one month follow-up scores ($F (1, 134) = 3.88, p < .05$, $\eta^2 = 0.03$), but not significant in differentiating between post-program and one month follow-up scores ($F (1, 134) = 0.07, p = 0.79$). Findings suggested that children reported reduced positive affect from baseline to one month follow-up as illustrated in Figure 9.3. From post-program to one month follow-up, scores remained stable.
Figure 9.3. Children's mean score of positive affect from baseline to post-program to one month follow-up

Dieting was also found to be significant in differentiating between baseline, post-program, and one month follow-up scores. Specific contrasts revealed that dieting was found to be significant in differentiating between baseline and one month follow-up scores ($F (1, 134) = 52.65 \ p = .000, \ \eta^2 = 0.28$), and between post-program and one month follow-up scores ($F (1, 134) = 35.34 \ p = .000, \ \eta^2 = 0.21$). Children were found to report a reduction in dieting from baseline to one month follow-up and from post-program to one month follow-up as illustrated in Figure 9.4. Results indicated that children are continuing to report a reduction in dieting across time.
Finally, social comparisons differentiated between baseline, post-program, and one month follow-up scores of children. Specific contrasts revealed that social comparisons significantly differentiated between baseline and one month follow-up scores ($F (1, 134) = 16.47, p = .000, \eta^2 = 0.11$), and between post-program and one month follow-up scores ($F (1, 134) = 9.36, p < .01, \eta^2 = 0.07$). Children were found to report a reduction in social comparisons from baseline to one month follow-up, and from post-program to one month follow-up as illustrated in Figure 9.5. Consistent with dieting, the results indicated that children are continuing to report a reduction in social comparisons across time.
Figure 9.5. Children's mean score of social comparisons from baseline to post-program to one month follow-up

*Gender Effects*

Examination of univariate effects indicated that three of the seven dependent variables for gender were significant as shown in Table 9.3. These were negative affect, positive affect, and muscle bulk and exercise. Boys reported higher levels of negative affect than girls. Consistent with higher negative affect scores, boys reported lower positive affect than girls. However, both these effects were small as evidenced by $\eta^2$. In relation to muscle bulk and exercise, results indicated that boys reported higher muscle bulk and exercise scores than girls. This finding is consistent with results at baseline and post-program.
Table 9.3
Main Effect of Gender at One Month Follow-Up

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Boys</th>
<th>Girls</th>
<th>F(1,134)</th>
<th>p</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>15.36 (0.42)</td>
<td>14.08 (0.45)</td>
<td>4.41</td>
<td>.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>35.78 (0.81)</td>
<td>38.75 (0.87)</td>
<td>6.30</td>
<td>.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>38.85 (1.23)</td>
<td>37.90 (1.32)</td>
<td>0.28</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.15 (0.44)</td>
<td>34.09 (0.47)</td>
<td>2.16</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Dieting Practices</td>
<td>16.48 (0.65)</td>
<td>17.68 (0.70)</td>
<td>1.59</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>16.02 (0.55)</td>
<td>12.73 (0.59)</td>
<td>16.53</td>
<td>.000</td>
<td>0.11</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.33 (0.07)</td>
<td>0.21 (0.08)</td>
<td>1.23</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

9.2 Discussion

At one month follow-up, children in the control condition were found to report a reduction in muscle bulk and exercise scores from post-program to one month follow-up. While children in the treatment condition were found to report similar muscle bulk and exercise scores over the same period. A trend for negative affect was also found with children in the treatment condition reporting a more distinct reduction in negative affect than children in the control condition from post-program to one month follow-up. Overall, results indicated that from baseline to post-program to one month follow-up, children reported lower positive affect, dieting, and social comparison scores. Boys were found to report higher levels of negative affect, lower levels of positive affect, and higher muscle bulk and exercise scores than girls.

A trend for negative affect at one month follow-up in relation to the new prevention initiative was found. The trend indicated that children in the treatment condition showed a more distinct reduction in negative affect than children in the control condition from post-program to one month follow-up. This trend may have reflected a program effect. The completion of program activities by children in the treatment
condition reflected a trend to report reduced negative affect from post-program to one month follow-up.

Unexpectedly, results also indicated that children in the control condition showed a more distinct reduction in muscle bulk and exercise practices than children in the treatment condition from post-program to one month follow-up. The reduction in muscle bulk and exercise practices by children in the control condition may have reflected baseline sensitisation as discussed in Chapter 8 (Stice & Hoffman, 2004). Due to the repetitive nature of questionnaire completion, children in the control condition may have become more familiar and gained greater understanding of item content, and as a result, may have provided a more accurate depiction of muscle bulk and exercise practices. This finding is also consistent with Davison et al. (2003) who found that girls’ weight and shape concerns decreased over time when assessed repeatedly.

From baseline to post-program to one month follow-up, children in both the treatment and control conditions reported reduced positive affect, dieting, and social comparisons. As previously mentioned in Chapter 8, these findings may have also reflected baseline sensitisation (Stice & Hoffman, 2004). At baseline, children may have been unfamiliar with questionnaire items, lacked understanding of item content, or complied with the perceived goals of the facilitator and exaggerated weight and muscle concerns. Due to the repetitious nature of longitudinal follow-up, children may have gained greater familiarity and understanding of questionnaire items and reported a more accurate depiction of weight and muscle concerns over time.

The reduction in children’s positive affect, dieting, and social comparisons may also reflect a methodological constraint of repeated measures assessment as discussed in Chapter 8 (Davison et al., 2003). Davison et al. found, when assessing girls’ weight and shape concerns repeatedly across time, a reduction in these practices which was unlikely to represent the true inherent nature of girls’ attitudes and behaviour.

Finally, boys were found to report higher negative affect scores, lower positive affect scores, and higher muscle bulk and exercise scores than girls. Gender findings at one month follow-up were consistent with post-program results.
Chapter 10. Long Term Follow-Up:
Results and Discussion

10.1 Baseline to Long Term Follow-Up

A two-way condition (treatment and control) by gender (boys and girls) repeated measures multivariate analysis of variance was conducted to examine group differences on the seven dependent variables from baseline to post-program, one, three, and six month follow-up. These dependent variables were negative affect, positive affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction. Missing values, univariate outliers, linearity, and normality were screened according to guidelines provided by Tabachnick and Fidell (2001) and followed the same procedure as outlined previously in Chapter 8. A summary of these analyses is provided in Appendices L and M.

Using Pillai’s criterion, a significant main effect for time was found ($F(28, 84) = 4.29 \ p = .000, \eta^2 = 0.59$). The main effect for gender ($F(7, 105) = 4.38 \ p = .000, \eta^2 = 0.23$) was also found to be significant. A trend was observed for the interaction effect between condition and time ($F(28, 84) = 1.37 \ p = .14$). All the other multivariate effects were found to be not significant: condition ($F(7, 105) = 1.32 \ p = .25$), interaction between condition and gender ($F(7, 105) = 1.08 \ p = .38$), interaction between time and gender ($F(28, 84) = 0.80 \ p = .75$), and interaction between time, condition and gender ($F(28, 84) = 0.65 \ p = .90$).

Condition by Time Effects

Whilst the condition by time interaction effect was not significant ($F(28, 84) = 1.37 \ p = .14$), a number of trends were observed, particularly for muscle bulk and exercise, and negative affect. Examination of univariate effects indicated that muscle bulk and exercise ($F(4, 444) = 2.73 \ p = .03, \eta^2 = 0.03$) was significant and that negative affect ($F(4, 444) = 1.89 \ p = .11, \eta^2 = 0.02$) approached significance. Muscle bulk and exercise was found to be significant in differentiating between baseline, post-program, one month, three month, and six month follow-up scores of the treatment and control conditions. Specific contrasts revealed that muscle bulk and exercise was found to be
significant in differentiating between one month and six month follow-up scores ($F(1,111) = 4.01 \ p < .05$) of the treatment and control conditions as illustrated in Figure 10.1. This finding indicates that children in the treatment condition reported a slight reduction in muscle bulk and exercise from one month to six month follow-up, whilst children in the control condition reported a more marked increase in muscle bulk and exercise during the same period. However, this effect was small as evidenced by $\eta^2 = .04$. Muscle bulk and exercise was not found to be significant at differentiating between baseline and six month follow-up scores ($F(1,111) = 0.29 \ p = .59$), post-program and six month follow-up scores ($F(1,111) = 3.44 \ p = .07$), and three month and six month follow-up scores ($F(1,111) = 0.37 \ p = .55$) between the treatment and control conditions.

![Graph](image)

Figure 10.1. Group means of muscle bulk and exercise from baseline to post-program, one, three, and six month follow-up
With regards to negative affect, specific contrasts revealed that negative affect was found to be significant in differentiating between post-program and six month follow-up scores ($F(1, 111) = 6.33 \ p < .01, \eta^2 = 0.05$) of the treatment and control conditions as illustrated in Figure 10.2. Results indicated that between post-program and six month follow-up, children in the treatment condition reported a more distinct reduction in negative affect than children in the control condition. Negative affect was not found to be significant at differentiating between baseline and six month follow-up scores ($F(1, 111) = 0.67 \ p = .42$), one month and six month follow-up scores ($F(1, 111) = 0.84, \ p = .36$), and three month and six month follow-up scores ($F(1, 111) = 2.20 \ p = .14$) between the treatment and control conditions.

![Graph](image)

**Figure 10.2.** Group means of negative affect from baseline to post program, one, three, and six month follow-up
Time Effects

Examination of univariate effects indicated that five of the seven dependent variables for time were significant as shown in Table 10.1. These were negative affect, positive affect, dieting, muscle bulk and exercise, and social comparisons. Two of these effects, muscle bulk and exercise, and negative affect, have already been discussed as they were moderated by condition.

Positive affect was found to be significant in differentiating between baseline, post-program, one month, three month, and six month follow-up scores. Specific contrasts revealed that positive affect was found to be significant in differentiating between post-program and six month follow-up scores ($F (1, 111) = 7.56 \ p < .01, \eta^2 = 0.06$), and one month and six month follow-up scores ($F (1, 111) = 3.96 \ p < .05, \eta^2 = 0.03$). Findings indicated that children from both the treatment and control conditions reported an increase in positive affect from post-program to six month follow-up, and from one month to six month follow-up as illustrated in Figure 10.3.

![Graph showing positive affect scores over time](image)

Figure 10.3. Children's mean score of positive affect from baseline to post-program, one, three, and six month follow-up
Table 10.1
Main Effect of Time from Baseline to Post-Program to One Month to Three Month to Six Month Follow-Up

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Baseline Mean (SE)</th>
<th>Post-Program Mean (SE)</th>
<th>One Month Follow-Up Mean (SE)</th>
<th>Three Month Follow-up Mean (SE)</th>
<th>Six Month Follow-Up Mean (SE)</th>
<th>F(4,444)</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>15.43 (0.41)</td>
<td>15.15 (0.43)</td>
<td>13.94 (0.39)</td>
<td>13.93 (0.42)</td>
<td>13.71 (0.41)</td>
<td>9.72</td>
<td>.000</td>
<td>0.08</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>37.89 (0.72)</td>
<td>36.42 (0.72)</td>
<td>36.83 (0.83)</td>
<td>37.67 (0.88)</td>
<td>38.01 (0.81)</td>
<td>3.02</td>
<td>.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>39.75 (1.18)</td>
<td>38.81 (1.23)</td>
<td>37.00 (1.08)</td>
<td>37.94 (1.15)</td>
<td>39.90 (1.26)</td>
<td>4.69</td>
<td>.001</td>
<td>0.04</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.90 (0.37)</td>
<td>33.27 (0.46)</td>
<td>33.63 (0.45)</td>
<td>33.90 (0.47)</td>
<td>33.92 (0.48)</td>
<td>1.32</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Dieting Practices</td>
<td>18.52 (0.61)</td>
<td>17.48 (0.64)</td>
<td>15.51 (0.64)</td>
<td>15.90 (0.64)</td>
<td>15.42 (0.59)</td>
<td>15.09</td>
<td>.000</td>
<td>0.12</td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>16.79 (0.61)</td>
<td>14.14 (0.54)</td>
<td>12.69 (0.54)</td>
<td>13.09 (0.56)</td>
<td>12.83 (0.57)</td>
<td>27.68</td>
<td>.000</td>
<td>0.20</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.23 (0.07)</td>
<td>0.29 (0.07)</td>
<td>0.31 (0.07)</td>
<td>0.26 (0.06)</td>
<td>0.30 (0.06)</td>
<td>0.70</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>
Dieting was also found to be significant in differentiating between baseline, post-program, one month, three month, and six month follow-up scores. Specific contrasts revealed that dieting was found to be significant in differentiating between baseline and six month follow-up scores ($F (1, 111) = 25.53$ $p = .000$, $\eta^2 = 0.19$), and between post-program and six month follow-up scores ($F (1, 111) = 14.49$ $p = .000$, $\eta^2 = 0.12$). Children reported a reduction in dieting from baseline to six month follow-up and from post-program to six month follow-up as illustrated in Figure 10.4. Children's reduced dieting remained stable from one to six month follow-up.

Figure 10.4. Children's mean score of dieting from baseline to post-program, one, three, and six month follow-up
Finally, social comparisons were found to be significant in differentiating between baseline, post-program, one month, three month, and six month follow-up scores. Specific contrasts revealed that social comparisons were found to be significant in differentiating between one month and six month follow-up scores ($F(1, 111) = 16.52, p = .000, \eta^2 = 0.13$), and between three month and six month follow-up scores ($F(1, 111) = 8.05, p < .01, \eta^2 = 0.07$). From one month to six month follow-up, children reported an increase in social comparisons. Similarly, from three month to six month follow-up, children reported an increase in social comparisons as illustrated in Figure 10.5. Whilst children reported an initial reduction in social comparisons, at six month follow-up children reported an increase in social comparisons to levels similar to those reported at baseline.

![Figure 10.5. Children's mean score of social comparisons from baseline to post-program, one, three, and six month follow-up](image-url)
Gender Effects

Examination of univariate effects indicated that two of the seven dependent variables for gender were significant as shown in Table 10.2. These were positive affect, and muscle bulk and exercise. With regards to positive affect, girls reported higher levels of positive affect than boys. In relation to muscle bulk and exercise, results indicated that boys reported higher muscle bulk and exercise scores than girls. These findings were consistent with results at baseline, post-program, and one month follow-up. However, both these effects were small as evidenced by $\eta^2$.

Table 10.2
Main Effect of Gender at Six Month Follow-Up

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Boys</th>
<th>Girls</th>
<th>F(1,111)</th>
<th>p</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>14.79 (0.44)</td>
<td>14.07 (0.53)</td>
<td>1.12</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>35.58 (0.91)</td>
<td>39.15 (1.08)</td>
<td>6.35</td>
<td>.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>38.66 (1.38)</td>
<td>38.70 (1.63)</td>
<td>0.00</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>33.15 (0.50)</td>
<td>34.30 (0.60)</td>
<td>2.20</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Dieting Practices</td>
<td>15.86 (0.69)</td>
<td>17.27 (0.82)</td>
<td>1.73</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Muscle Bulk and Exercise</td>
<td>15.30 (0.63)</td>
<td>12.51 (0.74)</td>
<td>8.26</td>
<td>.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Body Dissatisfaction</td>
<td>0.39 (0.07)</td>
<td>0.27 (0.09)</td>
<td>0.02</td>
<td>ns</td>
<td></td>
</tr>
</tbody>
</table>

10.2 Discussion

At the six month follow-up, a number of trends were observed, particularly for muscle bulk and exercise, and negative affect. From one month to six month follow-up, children in the treatment condition were found to report a reduction in muscle bulk and exercise, while children in the control condition were found to report an increase in muscle bulk and exercise. Similarly, from post-program to six month follow-up, children in the treatment condition were found to report a more distinct reduction in negative affect than children in the control condition. Over the five assessments, children reported an increase in positive affect and social comparisons, and a reduction in dieting. Finally,
girls were found to report higher positive affect than boys, while boys were found to report higher muscle bulk and exercise than girls.

Results at six month follow-up indicated that the new prevention program has been somewhat successful at reducing muscle bulk and exercise, and negative affect. Long term findings indicated that whilst children in the treatment condition reported a reduction in muscle bulk and exercise, and negative affect, children in the control condition reported an increase in muscle bulk and exercise, and negative affect. As previously mentioned in Chapters 8 and 9, the reduction in muscle bulk and exercise suggests that attitudes and behaviours regarding muscle bulk and size may be more amenable to change than other body changing practices. Muscle bulk and size may not be as entrenched in Western culture as the slimness ideal and weight loss practices, and is therefore more easily influenced.

The new prevention program has also been somewhat successful at reducing negative affect in the long term. Program activities were designed to reduce negative affect and ameliorate physical and psychological wellbeing. Whilst changes in social comparisons and self-esteem were not observed, a reduction in negative affect may suggest that this factor is less stable and more amenable to change. Self-esteem could be described as a more stable characteristic which may require a more intensive program in order to observe long term changes. Similarly, social comparisons do not begin to emerge until 8 years of age and children in the current study may not have, as yet, developed the cognitive skills to deconstruct and distinguish their thoughts from their behaviour. Children may be engaging in unintentional or unconscious social comparisons and may not, as yet, be in-tune with their cognitions, thoughts, and behaviour (Wood et al., 2000). Furthermore, the employed measures of social comparisons and self-esteem may not have been sensitive to detect any changes or shifts in social comparisons and self-esteem (McVey & Davis, 2002; McVey, Davis et al., 2004). At baseline, children reported a low frequency of social comparisons and high self-esteem. More sensitive measures would be required to detect small changes in social comparisons and self-esteem considering the floor and ceiling effects, respectively.
Over the five assessments, children reported a reduction in dieting. At post-program, children reported a reduction in dieting which remained stable at six month follow-up. Children reported a reduction in positive affect at one month follow-up, although at six month follow-up children reported an increase in positive affect. At six month follow-up, children may have reported higher positive affect as they were aware that this was the final assessment session. With regards to social comparisons, children initially reported a reduction in social comparisons, however, at six month follow-up children reported an increase in social comparisons similar to baseline levels.

Time effects may be explained by maturational changes. In a similar study, McVey, Davis et al. (2004) implemented a universal prevention program with 285 girls aged 11 years and found that children in both the treatment and control conditions reported significant positive changes. McVey, Davis et al. found that children in the treatment condition initially reported an increase in body satisfaction, however, this program effect diminished at long term follow-up. Concurrently, children in the control condition also reported an increase in body satisfaction at post-program follow-up. However, at long term follow-up, children in the treatment condition reported a subsequent reduction in body satisfaction while children in the control condition reported an increase in body satisfaction surpassing levels reported by children in the treatment condition. McVey, Davis et al. also found a time effect for self-esteem. Children in both the treatment and control conditions reported an increase in self-esteem over time. Maturational changes were also observed in the current study with children in both the treatment and control conditions reporting a reduction in dieting and an increase in positive affect and social comparisons scores over time.

Time effects may also be explained by baseline sensitisation as discussed previously in Chapters 8 and 9 (Stice & Hoffman, 2004). Children may have over-reported weight and muscle concerns at baseline due to unfamiliarity with questionnaire items, lack of understanding of items, or complied with perceived facilitator’s goals. However, at follow-up children may have provided more accurate results regarding weight and muscle concerns due to an increase in familiarity with questionnaire items and greater understanding of item content.
Consistent with findings from the current study, Davison et al. (2003) found that girls' weight and shape concerns decreased over time with repeated measures assessments as discussed previously in Chapters 8 and 9. Davison et al. suggest that a reduction in girls' weight and shape concerns may reflect a methodological constraint of repeated measures assessment rather than a true representation of girls' attitudes and behaviour. With repeated measures assessment, children may become more comfortable with the assessment procedure and may be more likely to provide socially desirable responses (Davison et al., 2003).

Finally, at long term follow-up boys reported greater muscle bulk and exercise scores than girls consistent with both the baseline and the short term follow-up results summarized in Chapters 8 and 9. Girls were also found to report greater positive affect than boys. This finding is consistent with both post-program and the short term follow-up results summarized in Chapters 8 and 9.
Chapter 11. Conclusion and Future Directions

A summary of the findings of the “Everybody’s Different, Nobody Else Is Me” preadolescent prevention program are provided in this chapter. Limitations of the current study are also examined. Finally, future directions for prevention efforts with preadolescents with an emphasis on incorporating sociocultural influences in program development are discussed.

11.1 Evaluation of the Prevention Program

The findings from the new prevention initiative, “Everybody’s Different, Nobody Else Is Me”, indicated that the program was only somewhat successful at reducing muscle bulk and exercise, and negative affect at six month follow-up. Muscle bulk and exercise may not be as entrenched in Western culture as the thinness ideal for females and therefore may be more amenable to change. Attitudes and behaviours regarding muscle bulk and exercise may not be as “fixed” in middle childhood as attitudes and behaviours regarding a preference for thinness. Certainly, with the media portrayal of slenderness dating back 40 years and women’s body dissatisfaction and subsequent dieting viewed as “the norm” rather than the exception, a thinness ideal is indeed preferred (Hargreaves & Tiggemann, 2003; Kostanski et al., 2004; Lamb et al., 1993; Latner & Stunkard, 2003; Paxton, Wertheim, Pilawski, Durkin, & Holt, 2002; Tiggemann & Slater, 2004). In contrast, the focus on a muscular ideal in society has only recently received attention and greater media awareness, and may have not, as yet, been internalised by children (McCabe & Ricciardelli, 2004). For example, Murnen et al. (2003) examined the awareness and internalisation of media images among 146 boys and girls. For girls, Murnen et al. found that high body esteem was negatively related to less awareness and internalisation of the thin ideal for females. For boys, awareness of the muscular ideal for males was not found to be related to body esteem. While boys were aware of the muscular ideal for males, fewer had internalised the muscular ideal. Murnen et al. suggest that boys are exposed less frequently to media messages portraying the muscular ideal for males, whilst girls are more frequently exposed to media messages about thinness and dieting.
Findings also indicated that the new prevention initiative was somewhat successful at reducing negative affect at six month follow-up. Children in the treatment condition may have reported an initial increase in negative affect at post-program due to the completion of program activities. Children in the treatment condition were disappointed that the program activities had ended, with many children wanting to participate in additional activities. However, in the long term children in the treatment condition continued to report a reduction in negative affect scores.

At six month follow-up, children in both the treatment and control conditions reported reduced dieting and increased positive affect. With regards to social comparisons, children initially reported a reduction in social comparisons, however, this had diminished at long term follow-up and children’s social comparisons had returned to baseline levels. No changes were found in relation to self-esteem and body dissatisfaction with the majority of children reporting high self-esteem and body satisfaction at baseline.

An increase in children’s understanding of the questionnaire items from baseline to six month follow-up may explain some of the changes in children’s weight and muscle concerns. This is referred to as baseline sensitisation (Stice & Hoffman, 2004). From baseline to six month follow-up, children may have become comfortable and familiar with the questionnaire terminology and content, and therefore, more accurately reported their weight and muscle concerns. Consistent with baseline sensitisation, Davison et al. (2003) found that girls’ weight and shape concerns decreased over time with repeated measures assessments. While it is unlikely that girls’ weight and shape concerns decreased over time, Davison et al. described girls’ reduction in weight and shape concerns as a methodological constraint of repeated measures assessments. With repeated measures assessments, Davison et al. found that girls became more comfortable with the assessment process and were more likely to provide socially desirable responses.

The limited changes in children’s weight and muscle concerns across the five assessments may also be attributed to the low frequency of dieting, muscle bulk and
exercise, negative affect, body dissatisfaction, and social comparisons, and high self-esteem and positive affect scores reported at baseline. With low baseline scores producing floor effects for dieting, muscle bulk and exercise, negative affect, body dissatisfaction, and social comparisons, and ceiling effects for self-esteem and positive affect, it is difficult to show change. Therefore, it is also difficult to fully assess the effectiveness of the “Everybody’s Different, Nobody Else Is Me” prevention program.

Furthermore, children’s reduced dieting and increased positive affect and social comparisons may be attributed to developmental changes or maturational effects. In the current study, children were found to report an increase in social comparisons at six month follow-up. Children do not begin to engage in social comparisons until 8 years of age. Therefore, the attitudes and behaviour of children in the current study regarding social comparisons may not be fully developed (Levine & Smolak, 2001). It may not be until children are 10 or 11 years of age that they have the cognitive skills to distinguish their thoughts from their behaviours and begin to consciously internalise social comparison information. Therefore, during middle to late childhood, girls and boys may naturally engage in greater unintentional or unconscious social comparisons as they develop cognitively (Wood et al., 2000). Further studies are required to gain a better understanding of the development of social comparisons.

The findings from the current study are, however, consistent with the maturational changes reported by McVey and Davis (2002) and McVey, Davis et al. (2004). McVey and Davis implemented a positive body image program with 263 girls in grade six and found no long term program effects. McVey and Davis found that children in both the treatment and control conditions reported an increase in body satisfaction and a reduction in eating problems at 12 month follow-up. McVey and Davis suggest that the reduction in children’s weight and shape concerns may be due to maturational changes. Longitudinal studies are needed to fully understand the development and maintenance of children’s weight and shape concerns.

The time effects observed in the current study may have also resulted from other health curricula implemented in schools, such as social skills programs which include increasing children’s self confidence. Whilst children in the treatment condition
completed the program activities, children in both the treatment and control conditions continued to receive regular health curricula at school. School curricula may have focused on similar factors, such as healthy eating and exercise, as the new prevention program. Therefore, children in the control condition may have reported a reduction in dieting and an increase in positive affect and social comparisons as a result of receiving health education at school.

Furthermore, the time effects observed in the current study may have resulted from completion of the questionnaire only. Children in both the treatment and control conditions completed the questionnaire and simply completing questionnaire items may be a form of prevention. By completing the questionnaire, children in the treatment and control conditions may have gained greater awareness and insight of their own weight and muscle concerns and modified their attitudes and behaviours on their own accord to reduce this discrepancy.

Finally, the longer term results found in the current study are consistent with the overall unsuccessful nature of past preadolescent prevention programs (McVey & Davis, 2002; McVey, Davis et al., 2004). To date there is still no evidence-based study that shows that preadolescent prevention programs are more successful than prevention initiatives implemented with adolescents or adults. Further evidence is needed to show that the attitudes and behaviour of children are more amenable to change than those of adolescents or adults.

11.2 Limitations of the Current Study

Whilst the current study was devised to overcome some of the methodological biases of previous research, the current investigation had a number of limitations. Firstly, the modest sample size may have rendered the statistical power of the study too low to detect any treatment effects with some findings only approaching significance. This may have been particularly true at six month follow-up. The number of boys and girls who completed the questionnaire decreased from 156 at baseline to 137 at six month follow-up.
Further studies are required which target the extent to which more positive program effects may be dependent on the sample size. In their review of the literature, Stice and Hoffman (2004) found that sample size per se was not found to be associated with positive program outcomes. Stice and Hoffman found that program effects associated with eating disorder risk factors or eating pathology were not necessarily found in studies with larger samples. On the contrary, Stice and Hoffman found that studies which included a smaller sample size produced more positive outcomes. Stice and Hoffman offer no explanation for this finding. This may be due, however, to the intensity of the program with smaller samples. With smaller samples, program activities may be more effective with greater personal discussion and greater individual involvement producing greater change.

Secondly, the baseline results reported by children in the current study indicated that the majority of children had high self-esteem and positive affect producing ceiling effects, and low dieting, muscle bulk and exercise, social comparisons, negative affect, and body dissatisfaction producing floor effects. Between 51% and 92% of boys and 60% to 90% of girls responded positively to the eight items which measured self-esteem. With regards to positive affect, 55% to 92% of girls and 40% to 81% of boys reported high positive affect. Only 14% to 26% of girls and 6% to 23% of boys reported dieting, and 3% to 21% of girls and 4% to 48% of boys reported muscle bulk and exercise. Children also reported low levels of social comparisons with children (1% to 22% of girls and 2% to 27% of boys) and adults (0% to 18% of girls and 2% to 17% of boys). Only a small proportion of girls (0% to 11%) and boys (1% to 12%) reported negative affect. Similar proportions of boys and girls reported body satisfaction with half of the sample (57% of boys and 51% of girls) reporting being satisfied with their body. Previous studies have reported higher levels of dieting, muscle bulk and exercise, social comparisons, negative affect, and body dissatisfaction and lower levels of self-esteem and positive affect among children than in the current study suggesting that the current sample was somewhat atypical (Edlund et al., 1996; Holt & Ricciardelli, 2002; Ricciardelli & McCabe, 2001; Ricciardelli et al., 2003; Rolland et al., 1997). Clearly, the new program developed for this thesis needs to be evaluated with a larger and more representative group of children in order to more fully assess its effectiveness.
As a result of the baseline findings, it is difficult to produce additional positive changes in relation to children's weight and muscle concerns. Furthermore, with the baseline floor effects for dieting, muscle bulk and exercise, social comparisons, negative affect, and body dissatisfaction, and baseline ceiling effects for self-esteem and positive affect, it is difficult to determine whether the new prevention initiative has been successful at reducing children's weight and muscle concerns. However, the new prevention initiative has been effective at preventing subsequent increases in children's weight and muscle concerns. The new prevention initiative was a selective prevention program designed to reduce risk factors and promote protective factors among children who may be at greater risk of engaging in health risk behaviours (Paxton, 2002a, 2002b). The new prevention program was successful at preventing an increase in risk factors associated children's weight and muscle concerns, such as muscle bulk and exercise, and negative affect, but not as effective at promoting or increasing protective factors, such as positive affect and self-esteem.

Another limitation of the current study is that the measurement instruments may not have been sensitive enough to detect small changes in children's individual factors, such as self-esteem, and subsequent weight and muscle concerns. The outcome measures may not have adequately captured children's attitudinal and behavioural changes as a result of completing the prevention initiative (McVey, Davis et al., 2004). More sensitive measurement instruments are needed to more accurately assess improvements in individual or protective factors.

Additionally, the developmental framework endorsed by the new prevention program made it difficult to assess all resiliency factors targeted in program activities. The new prevention initiative was designed to reduce risk factors, such as social comparisons, negative affect, and self-esteem, and promote protective factors among children. Whilst the new prevention program targeted social comparisons, negative affect, and self-esteem, other related and more specific dimensions, such as depression and anxiety, incorporated within these three risk factors were not individually assessed. Depression and anxiety were not assessed individually but were examined using a global measure of negative affect.
For many people exercise is conceptualised as a health promotion practice (Berk, 2000), however, in this thesis exercise was conceptualized as an over-emphasis on exercise practices. The focus of this thesis was on reducing excessive exercise practices although exercise practices per se were not measured at baseline, post-program or follow-up periods. Additional research is required to investigate the role of exercise in ameliorating the health status of children.

In the present study, the author was both the facilitator who administered the questionnaires and the person who administered the program activities. As a result, the facilitator may have unintentionally conveyed the goals of the research project and children may have complied with the facilitator’s goals. This problem could be eliminated by having separate facilitators who administer the questionnaires and administer the program activities. In this way, children may feel less compelled to comply with the perceived goals of the facilitator who administered the program activities when completing assessment measures. Furthermore, the facilitator may have conveyed information regarding the program activities to children in the control condition therefore contaminating the control aspect of the study. This possibility is also discussed by McVey and Davis (2002). Contamination of the control aspect of the study via facilitator bias could have also been a problem in the current study. This limitation could be avoided by having a control group who does not complete the questionnaires until the long term follow-up (Smolak & Levine, 2001b).

Although the present study included a six month follow-up, a longer term follow-up is required to determine the effectiveness of preadolescent prevention efforts into adolescence (McVey, Davis et al., 2004). It may be that the current prevention initiative may have been effective at preventing an increase in children’s weight and muscle concerns, however, further reductions may not emerge until they reach adolescence when engagement in health risk behaviours escalates.

Prevention initiatives which include more than nine sessions may be found to be more effective than programs which include fewer sessions (Public Health Research, Education & Development Program, 2001). This may have been a problem in the current
study. Prevention initiatives implemented with children may require a greater number of sessions to ensure change via repetitive learning.

The new prevention program was found to be somewhat successful at reducing muscle bulk and exercise, and negative affect among grade four children at six month follow-up, however, no other attitude and behaviour changes were found. Consistent with the findings from the current study, Phelps et al. (1999) found no attitude and behaviour changes among early adolescents from grades six to eight after implementing an eating disorder prevention program with adolescents and adults. Positive changes were found among older participants from grades 9 to 11 and college students. Phelps et al. conclude that perhaps the content of the program was not suitable for this age group. This may also have been a problem in the current study as some of the program content of the new prevention program may not be suitable for children aged 9 years. For example, asking children to differentiate between their thoughts and behaviour and consider how their behaviour influences others may require well developed abstract thought. Clearly, further work is needed which develops appropriate program content for children in this age group.

While the content of the new prevention initiative may not have been suitable for preadolescents, grade four children may also be too young to participate in prevention initiatives (Public Health Research, Education & Development Program, 2001). No programs which included participants younger than grade four were located. However, other prevention initiatives which have included grade four children have found positive changes in relation to weight and shape concerns (Kater et al., 2000; Smolak et al., 1998a, 1998b). Smolak et al. (1998a, 1998b) implemented the Eating Smart, Eating For Me prevention program with 266 grade four children and found that children’s knowledge regarding fat, nutrition, and the harmful effects of dieting improved. These positive changes may also be attributable to the length of the Eating Smart, Eating For Me program (10 sessions), and the inclusion of parents in encouraging and reinforcing children’s positive attitude and behavioural changes.

Furthermore, longitudinal studies are required to gain a better understanding of the developmental and maturational changes associated with weight and muscle
concerns amongst children. Additional research is required to investigate the predictive nature of individual factors, such as social comparisons, negative affect, and self-esteem, in children's development of weight and muscle concerns. The relationship between social comparisons and weight and shape concerns has primarily been studied with adolescents and adults and has not included preadolescents. Studies which include children are needed to better understand the development of social comparisons and the subsequent influence of social comparisons on children's weight and shape concerns. Similarly, the relationship between negative affect and weight and shape concerns has been extensively studied among adolescents and adults, and there is increasing evidence indicating the importance of this relationship in childhood. However, additional longitudinal studies are required to determine temporal precedence.

Increasing research with adults and adolescents suggests that social comparisons and negative affect are interrelated. Additional studies which include children are needed to determine the importance of this relationship in preadolescence. Finally, literature in other behavioural domains suggests that social comparisons, negative affect, and self-esteem are interrelated. However, no single study has investigated the relationship between these three risk factors in the development and maintenance of children's weight and muscle concerns. Further research is required to examine this interrelationship and assist with the development of more effective prevention programs.

A final limitation of the present study was the self-report nature of the assessment measures. Children may have provided socially desirable responses. In one study, Tilgner, Wertheim, and Paxton (2004) examined the effect of social desirability among 677 adolescent girls from grades seven and eight. Four hundred and forty-six girls participated in a prevention program which included a videotape addressing body image concerns and dieting practices and the remaining 233 girls acted as the control comparison. Tilgner et al. found that social desirability did not influence girls' responses greatly. Social desirability was found to account for a very small amount of variance in girls' drive for thinness (3.7%), body dissatisfaction (5.9%), and bulimic tendency (8.8%) scores. Furthermore, social desirability was not found to influence both the treatment and control condition girls' responses on measures at post-program or one month follow-up. However, to gain a better understanding of children's attitudes and
behaviours, self-report measures could be corroborated with behavioural observations, and parents' and teachers' reports.

11.3 Future Prevention Initiatives

With few long term benefits found in relation to the "Everybody's Different, Nobody Else Is Me" prevention program which incorporated the disease-specific pathways model and the nonspecific vulnerability-stressor model to prevention, prevention initiatives which include the empowerment-relational model may be more effective. The empowerment-relational model emphasizes a participatory approach to prevention whereby staff, professionals, and participants work together to change adverse factors that are identified by the target group as being detrimental to their wellbeing, such as factors affecting their perceived body image (Levine & Smolak, 2001; Piran, 1998, 1999). Collectively, the target group is encouraged to discuss and communicate with others regarding their concerns. Communication is thought to empower the target group whereby constructive action is devised. Via action, the immediate environment is transformed, for example, by implementing school policies to change the overall ethos of the school. Likewise, greater self-acceptance and psychological wellbeing is found among the target group (Levine & Smolak, 2001; Piran, 1998, 1999).

A school-based prevention program may be considered most beneficial due to the ability to change individual, family system, school environment, peer relationships, and the wider community within the school context (The Eating Disorders Foundation of Victoria and the Victorian Centre of Excellence in Eating Disorders, 2004). With the majority of children and adolescents attending school, prevention initiatives may positively influence the development of life skills to prevent future engagement in risk taking behaviours, such as dieting or excessive exercise practices. However, the development of school-based prevention initiatives is still in the early stages. To date, no evidence exists which suggests that prevention programs are either harmful or successful in nature (The Eating Disorders Foundation of Victoria and the Victorian Centre of Excellence in Eating Disorders, 2004).
Despite this conundrum, a number of factors are believed to influence the success of prevention programs (Public Health Research, Education & Development Program, 2001). Prevention programs which include more than nine sessions are viewed as being more successful (Public Health Research, Education & Development Program, 2001). With greater program length, the repetitive nature of program activities and the reinforcement of subsequent attitude and behaviour changes are thought to result in more positive long term effects. This may be even more important in the development of prevention initiatives with young children. In contrast, Stice and Hoffman (2004), in a review of eating disorder programs with children, adolescents, and adults, found that length of program per se was only weakly related to positive outcomes. Stice and Hoffman found that several of the longest programs (approximately 10 to 16 hour programs) produced no effects with regards to changing factors related to eating disorder symptomatology. Clearly further research is needed to more directly assess this issue with both children and adolescents.

Programs which incorporate booster sessions in school curricula may be more successful than initiatives which are one-off (McVey, Davis et al., 2004; Public Health Research, Education & Development Program, 2001). Prevention programs that include booster sessions to reinforce subsequent attitude and behavioural changes may lead to greater long term effects. Furthermore, the integration of program content into other areas of the school curricula may also enable continuous reinforcement of attitude and behaviour changes regarding weight and muscle concerns.

It has also been suggested that prevention initiatives implemented with primary school age children may not be as effective as those implemented with adolescents (Paxton, 2002a, 2002b; Public Health Research, Education & Development Program, 2001; Stice & Ragan, 2002). Stice and Ragan have reviewed literature which suggests that primary school age children do not have the cognitive ability to manage information regarding weight and shape concerns which subsequently results in minimal attitude and behaviour changes. Stice and Ragan also argue that program effects are unlikely to last long enough to combat against weight and shape concerns experienced in adolescence. Similarly, Stice and Hoffman (2004) have argued that younger participants have not yet struggled with their weight and shape concerns for a long enough period of time to be
motivated to engage in program activities. While children may not have experienced chronic weight and shape concerns, by adolescence, sociocultural influences are thought to play a larger and more important role in determining adolescents' motivation to change (Levine & Smolak, 2001). Teenagers may not be motivated to change during this period of development when peers and the media play an integral role in identity formation and peer acceptability. Therefore, it may not be until late adolescence or early adulthood when individuals are cognitively aware of their weight and shape concerns and are motivated to change their attitudes and behaviours. Clearly, further research is needed to resolve the debate about whether prevention programs are best implemented during middle childhood or during early to late adolescence.

In addition, targeted prevention programs may be more effective than universal or selective prevention efforts (Paxton, 2002a, 2002b; Public Health Research, Education & Development Program, 2001; The Eating Disorders Foundation of Victoria and the Victorian Centre of Excellence in Eating Disorders, 2004). Targeted prevention initiatives aim to prevent further development of eating disorder symptomatology among populations with pre-existing "at risk" weight and shape concerns (Paxton, 2002a, 2002b). In contrast, universal prevention initiatives aim to change the eating attitudes and behaviour of the population at large while selective prevention initiatives aim to prevent the development of weight and shape concerns among non-symptomatic populations deemed "at risk" or vulnerable to the later development of eating disorder symptomatology (Paxton, 2002a, 2002b). No targeted prevention programs with child populations were located. However, Stice et al. (2003) implemented a targeted dissonance-based prevention initiative with 148 female high school and college students with pre-existing body dissatisfaction and found some positive changes. Stice et al. found positive changes with regards to thin-ideal internalisations and dieting behaviour at a six month follow-up, and a reduction in body dissatisfaction and bulimic tendencies from baseline to post-program. Girls' negative affect was also found to decrease from baseline to three month follow-up.

Preadolescent targeted prevention programs would include children who are perceived as being at increased risk of developing weight and muscle concerns. Targeted programs are designed to identify children at increased risk and provide support, namely
a program, to minimise risk and later engagement in problem eating attitudes and behaviours, such as dieting. However, targeted programs need to take into account additional problems. Targeted programs may single-out children and create greater alienation within the school community. Worse still, children may become targets of teasing or bullying. Furthermore, children who are identified as being "at risk" who are invited to attend a program would most likely refuse participation due to the above mentioned reasons. However, Stice and Ragan (2002) argue that targeted programs with adolescents are most successful as individuals are typically distressed and are, therefore, more motivated to change. In addition, targeted programs are more cost effective in terms of resources.

Whilst the “Everybody’s Different, Nobody Else Is Me” prevention program primarily targeted individual factors, such as self-esteem, future prevention efforts need to also target sociocultural factors, such as parental influences and the media, to foster greater attitude and behaviour changes (The Eating Disorders Foundation of Victoria & the Victorian Centre of Excellence in Eating Disorders, 2004). Sociocultural influences have been found to be associated with children’s weight and shape concerns. Sociocultural influences include actual or perceived messages from parents, peers, and the media regarding body image concerns and body change strategies (Ricciardelli & McCabe, 2001). Moreover, these can include messages about losing weight and messages about increasing muscles (Ricciardelli et al., 2000).

11.4 Sociocultural Influences and Future Prevention Initiatives

Although there is still little research that has examined the role of sociocultural influences on body image concerns and related behaviours among preadolescents, to date the findings reflect those found with adolescents (Ricciardelli & McCabe, 2001). Edlund et al. (1996) in a sample of 50 girls aged 7 years, found that girls who reported that their mothers and their fathers were currently on a diet recorded a significantly higher mean total ChEAT score, indicating greater participation in weight control activities, such as dieting. In another study, Smolak, Levine, and Schermer (1999) investigated parental input and weight concerns among 554 fourth and fifth grade school children and a sub-sample of 220 parents. Smolak et al. found that direct parental
comments, usually made by the mother, concerning a child’s weight appeared to be more powerful influences on weight and body shape concerns and behaviours than the physical appearances modeled by parents. In particular, girls’ weight loss attempts were related to parental modeling in the form of weight complaints made by parents in regard to themselves. Additionally, a father’s concern and desire for thinness was related to girls’ concern about being or getting too fat (Smolak et al., 1999). Schur et al. (2000) also examined body dissatisfaction, dieting practices and perceived influences of these cognitions and behaviours in 62 children aged 8 to 13 years. Schur et al. found that children indicated that their primary source of information regarding dieting was from their families and 76% of children stated that they heard about dieting from a family member, typically, a parent.

In one longitudinal study, Davison and Birch (2002) examined sociocultural influences in determining weight status and self-concept among 182 girls aged 5 to 7 years. Parental criticism received by girls at 5 years of age was associated with lower perceived physical ability at age 7 years. In addition, parental criticism at age 7 years was associated with lower perceived peer acceptance, physical ability, and body esteem at the same age.

In a recent study (McCabe et al., unpublished) that examined messages portrayed by mothers and teachers regarding weight and muscle concerns of 53 pre-school children aged 3 to 4 years, it was found that mothers primarily communicated messages to their daughters about weight loss, and messages to their sons about increasing muscle bulk. Furthermore, results indicated that children appeared to be reflecting mothers’ own body perceptions. In the study, mothers typically reported body dissatisfaction and engaged in dieting practices to lose weight. Children’s concerns regarding their bodies appeared to be endorsed by mothers. Boys reported that they were concerned about their muscle size and girls reported that they were concerned about becoming overweight. The role of the teacher was less clear in this study due to the small sample of teachers.

Perceived and actual messages received from peers have also been found to influence children’s body dissatisfaction and eating practices. In one study, Oliver and Thelen (1996) found that peer likeability was the major predictor of eating and body
concerns in third and fifth grade children. Moreover, peer messages (teasing) were related to peer likeability, and eating and body concerns (Oliver & Thelen, 1996). In another study, Sands and Wardle (2003) examined the internalisation of body shapes in 356 girls aged 9 to 12 years and found that peer weight-related attitudes and behaviours were associated with girls' awareness of the Western cultural stereotype of the thin ideal. Internalisation of the thin ideal was thought to occur via peer communications regarding weight, eating, and appearance.

With regards to muscle concerns, Ricciardelli et al. (2003) found perceived pressures from parents, peers, and the media predicted children's body image concerns, engagement in strategies to lose weight and increase muscle bulk, and the importance placed on weight and muscles in 507 children aged 8 to 11 years. Specifically, perceived pressure to lose weight from parents, peers, and the media was found to be a unique predictor of girls’ and boys’ body dissatisfaction and strategies to lose weight. In addition, perceived pressure to lose weight from parents, peers, and the media was found to be associated with strategies to increase muscle bulk for boys only. Perceived pressure to increase muscle bulk from parents, peers, and the media was found to be associated with muscle importance and strategies to increase muscles for both boys and girls.

Whilst evidence exists that children's weight and muscle concerns are associated with sociocultural influences, few school-based preadolescent prevention initiatives have endeavoured to include parental, peer, and media influences (McVey & Davis, 2002; Smolak & Levine, 2001b; Smolak et al., 1998a, 1998b). McVey, Pepler, Davis, Flett, and Abdolell (2002) found that parental support was a protective factor against weight and shape concerns in a sample of 363 grade seven and eight girls. In particular, low paternal support was found to be associated with disordered eating practices among girls. Future preventive efforts need to include parent education in order for prevention messages received at school to be reinforced in the home. Parents may be included via attending information nights in which the importance of positive role models and normal developmental body changes may be discussed (The Eating Disorders Foundation of Victoria and the Victorian Centre of Excellence in Eating Disorders, 2004). Furthermore, parents could be involved in a school working team, with students, which
promotes body satisfaction and healthy eating and exercise amongst children within the school environment and broader community. Families located in close proximity to the school may develop a “walking school bus” to encourage children to be active. Furthermore, teachers, parents, and students can work collaboratively to develop and implement school policies to create an environment which provides physical and psychological wellbeing (The Eating Disorders Foundation of Victoria and the Victorian Centre of Excellence in Eating Disorders, 2004).

Whilst it is important for parents to be educated regarding children’s weight and muscle concerns and the impact of their own behaviour on the development of these concerns in their children, teachers also require greater training regarding the development of weight and muscle concerns among children (The Eating Disorders Foundation of Victoria and the Victorian Centre of Excellence in Eating Disorders, 2004). Teachers interact with children on a daily basis and it is important for teachers to be aware of the protective and risk factors associated with children’s weight and muscle concerns. Consistent with the empowerment-relational model, this will enable teachers and the broader school community to work with children to address their weight and muscle concerns and prevent later engagement in risk taking behaviours, such as dieting (Levine & Smolak, 2001; Piran, 1998, 1999). Via the empowerment-relational model, changes in the school ethos should systematically result in changes in the local community regarding the problematic nature of children’s weight and muscle concerns (Levine & Smolak, 2001; Piran, 1998, 1999). Sporting groups or cultural support groups in the local community may also be invited to be involved in school-based initiatives to prevent children’s weight and muscle concerns (The Eating Disorders Foundation of Victoria and the Victorian Centre of Excellence in Eating Disorders, 2004). For example, schools may implement a media literacy week and discuss the use of media glamour techniques. In addition, teachers may invite photographers and journalists from local newspapers to discuss these techniques with children, in order for children to develop greater critical media awareness.
11.5 Conclusion

The “Everybody’s Different, Nobody Else Is Me” preadolescent prevention program was found to be somewhat successful at reducing muscle bulk and exercise, and negative affect in the long term at six month follow-up. From one to six month follow-up, children in the treatment condition were found to report a reduction in muscle bulk and exercise, while children in the control condition reported an increase in muscle bulk and exercise over the same period. A trend for negative affect indicated that children in the treatment condition showed a more distinct reduction in negative affect than children in the control condition from post-program to six month follow-up. However, children in both the treatment and control conditions reported an increase in positive affect and social comparisons, and a reduction in dieting at six month follow-up. At six month follow-up, girls were found to report higher positive affect than boys, while boys were found to report higher muscle bulk and exercise than girls.

Whilst the current study had some methodological strengths, such as a control comparison group and long term follow-up, a number of limitations existed. These included a modest sample size, baseline ceiling effects (self-esteem and positive affect) and floor effects (dieting, muscle bulk and exercise, social comparisons, negative affect, and body dissatisfaction), measurement instruments that may not have been sensitive enough to detect subtle attitude and behaviour changes, and the developmental framework employed made it difficult to assess all resiliency factors. Other weaknesses included a facilitator bias, no longer term follow-up into adolescence, length of program, program content may not have been suitable for age group, and children may have been too young to benefit from the program activities. Further limitations included the need for further research to clarify the role of social comparisons, negative affect, and self-esteem in the development of children’s weight and muscle concerns, and the reliance on self-report measures.

Future prevention initiatives need to overcome the limitations of the present study and additionally target sociocultural influences. Attitude and behavioural changes resulting from school-based prevention initiatives need to be reinforced not only in the broader context of the school community and ethos but also in the home by parents and
extended family. Prevention initiatives may need to incorporate the empowerment-relational model and occur at a whole school level not just at the individual grade level to ensure that positive changes remain stable and fixed. Furthermore, attitude and behavioral changes resulting from prevention efforts need to be reinforced and integrated into existing school curriculum. With the development of school policies and teacher, parent, and student working teams, it is hoped that prevention efforts will be more successful at alleviating children's weight and muscle concerns.
REFERENCES


National Center for Health Statistics (2000). *Body mass index for age percentiles.* USA: The National Center for Chronic Disease Prevention and Health Promotion.


Appendix A. Deakin Ethics Committee Approval
MEMORANDUM

TO: Ms Kate Holt
   Psychology
   Melbourne

FROM: Secretary, Deakin University Human Research Ethics Committee (DU-HREC)

DATE: 29 November 2002

SUBJECT: PROJECT: EC 131-2002 (Please quote this project number in future communication.)

DEVELOPMENT AND IMPLEMENTATION OF THE "EVERYBODY'S DIFFERENT, NOBODY ELSE IS ME" PREVENTION PROGRAM FOR PREADOLESCENTS

This application was considered at the DU-HREC meeting held on 29 July 2002.

APPROVAL HAS BEEN GIVEN FOR MS KATE HOLT, UNDER THE SUPERVISION OF DR LINA RICCIARDELLI, TO UNDERTAKE THIS PROJECT FROM 1 OCTOBER 2002 TO 31 DECEMBER 2003.

All required materials have been received and conditional approval for the project confirmed.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the application and approval. It is your responsibility to contact the Secretary immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

Victoria Emery
Secretary, DU-HREC
(03) 9251 7123
Appendix B. Catholic Education Department Approval
Ms K Holt
C/- Dr L Ricciardelli
School of Psychology
Deakin University
221 Burwood Highway
BURWOOD VIC 3125

Dear Ms Holt,

I am writing with regard to your letter of 9 August 2002 in which you referred to your forthcoming research project into the implementation of an educational program for preadolescents regarding body image and eating behaviours. I understand that this research is part of your studies for a Doctorate of Health Psychology at Deakin University. You have asked approval to approach some Catholic primary schools in the Archdiocese of Melbourne as you wish to involve students in Year 4.

I am pleased to advise that your research proposal is approved in principle subject to the following standard conditions and appropriate privacy procedures being in place when the students' heights and weights are measured.

1. The decision as to whether or not research can proceed in a school rests with the School Principal. So you will need to obtain approval directly from the Principal of each school that you wish to involve.

2. You should provide each Principal with an outline of your research proposal and indicate what will be asked of the school. A copy of this letter of approval, and a copy of notification of approval from the University's Ethics Committee, should also be included.

...2
3. For this type of research, which involves school visits, a Criminal Record check is necessary. You will have to obtain a certificate from the Victoria Police and show this to the Principal before starting your research in schools.

4. No student is to participate in the research study unless s/he is willing to do so and informed consent is given in writing by a parent/guardian.

5. You should provide the names of schools which agree to participate in the research project to the Information Services Unit of this Office.

6. Any substantial modifications to the research proposal, or additional research involving use of the data collected, will require a further research approval submission to this Office.

7. Data relating to individuals or schools are to remain confidential.

8. Since participating schools have an interest in research findings, you should discuss with each Principal ways in which the results of the study could be made available for the benefit of the school community.

9. At the conclusion of the study, a copy or summary of the research findings should be forwarded to the Information Services Unit of the Catholic Education Office.

I wish you well with your research study. If you have any queries concerning this matter, please contact Mr Mark McCarthy of this Office.

With every best wish,

Yours sincerely,

(Rev. Mgr T. M. Doyle)
DIRECTOR OF CATHOLIC EDUCATION
Appendix C. Victorian Department of Education and Training Approval
Dear Ms Holt,

Thank you for your application of 23 August 2002 in which you request permission to conduct a research study in Victorian government schools titled: Development and Implementation of the "Everybody's Different, Nobody Else Is Me" Prevention Program for Preadolescents.

I am pleased to advise that on the basis of the information you have provided your research proposal is approved in principal, subject to the conditions detailed below.

1. You obtain approval for the research to be conducted in each school directly from the principal. Details of your research, copies of this letter of approval and the letter of approval from the relevant ethics committee are to be provided to the principal. The final decision as to whether or not your research can proceed in a school rests with the principal.

2. No student is to participate in this research study unless they are willing to do so and parental permission is received. Sufficient information must be provided to enable parents to make an informed decision and their consent must be obtained in writing.

3. As a matter of courtesy, you should advise the relevant Regional Director of the schools you intend to approach. An outline of your research and a copy of this letter should be provided to the Regional Director.

4. Any extensions or variations to the research proposal, additional research involving use of the data collected, or publication of the data beyond that normally associated with academic studies will require a further research approval submission.
5. At the conclusion of your study, a copy or summary of the research findings should be forwarded to me at the above address.

I wish you well with your research study. Should you have further enquiries on this matter, please contact Louise Dressing, Senior Policy Officer, Schools, Communities and Networks, on 9637 2349.

Yours sincerely

Peter Enright
Manager
Schools, Communities & Networks

encl.
Appendix D. Letter of Invitation to Participate in Study to School Principal
Dear Principal,

My name is Kate Holt and I am a Doctor of Health Psychology Student at Deakin University. As part of my degree, I am undertaking a research project under the supervision of Dr Lina Ricciardelli, a Senior Lecturer in the School of Psychology. I am writing to invite your school to participate in a new research project in Primary Schools in Melbourne. The new project involves the implementation of a preventive educational program for preadolescents. In recent times there has been escalating concern surrounding the notion of body image disturbance and engaging in problem eating attitudes and behaviours in children as young as seven and eight years of age. Previously, problem eating attitudes and behaviours were linked to the onset of adolescence and were considered primarily an adolescent phenomenon. However, it is now commonly believed that children who engage in these problem eating attitudes and behaviours may be at risk of becoming obese, leading to other major health concerns, such as high blood pressure or diabetes, or of developing eating disorders, such as anorexia nervosa, later in life. With incidence rates of body image concerns and problem eating attitudes and behaviours increasing in primary school age children and the failure of adolescent intervention programs because they are deemed “too late”, prevention programs aimed at young children are a necessity.

The “Everybody’s Different, Nobody Else Is Me” prevention program for preadolescents is designed to prevent the increasing prevalence rates of body image concerns, problem eating attitudes, behaviours and obesity levels in grade four children. The prevention program also aims to increase children’s self-esteem and build greater self-confidence. The prevention program will encompass deconstructing media messages, encouraging children to create an awareness of other’s feelings and finally, promote a healthy lifestyle. Children will develop greater resilience against body image issues and problem eating attitudes and behaviours and be able to apply the problem solving skills developed to everyday life situations. The program involves children participating in group activities. For example, children will participate in class discussions, role plays, cooking activities, art and craft lessons and physical activities. In order to conduct this research, students from grade four will be invited to participate in the program activities (five one hour sessions) and complete a 45 minutes questionnaire on five occasions (prior to the implementation of the program, immediately pending the completion of the program, one, three, and six months after the program).

In order to evaluate the effectiveness of the prevention program, we require approximately 200 boys and girls to be involved in the program and complete the questionnaire. Approximately 100 children will be involved in the program (treatment group) and approximately 100 children will serve as the control comparison group and only complete the questionnaire on five separate occasions to determine the effectiveness of the program. Whilst the control group participants will not be initially involved in the program, an invitation will be extended to the schools to implement the program with grade four students at a later date following the attainment of the baseline and follow-up data.

After obtaining parental and individual consent, students will be asked to participate in the activities as outlined per the program and complete the questionnaire. No names or
identifying information will be required on the questionnaire. Participants will be required to complete a total of five scales pertaining to affective state, use of social comparisons, body image, self-esteem, and eating attitudes and behaviours. Demographic information pertaining to age, sex, height and weight will also be obtained from participants. Participants will complete the program activities and questionnaires in small groups of approximately 20-25 children, in a separate classroom. In relation to the questionnaire, all instructions, examples and scale items will be read aloud to increase understanding and address any queries expressed by children. Participants will be encouraged to work independently. Height and weight will be recorded at the completion of the questionnaire in another room to ensure privacy. Participants will only take part in the study if they have consent from a parent or legal guardian and if they verbally agree to participate in the study. Participants will be reminded that they are free to leave any question unanswered and that they are free to withdraw from the study at any time. Participants and parents or legal guardians will be debriefed about the study and the results of the study will be made available to them, on request, at the end of the study.

It is hoped that if the outcomes of the program are deemed successful, schools will be encouraged to incorporate the program in the school curricula to combat against increasing body image concerns, problem eating attitudes, behaviours, and obesity levels in young children. The study has been approved by the Deakin University Ethics Committee, The Catholic Education Department and The Department of Education, Employment and Training.

A draft outline of the "Everybody's Different, Nobody Else Is Me" prevention program content, and a draft copy of the questionnaire has been attached, as well as a sample "Consent on Behalf of a Minor or Dependent Person" form and Plain Language Statements. Should you require any further details or have any concerns about the study, I would be happy to speak or meet with you.

Thank-you for your time and consideration of the study. I look forward to a favourable reply.

Kate Holt
B. App. Sci (Psychology) (Honours)
Doctor of Psychology (Health) Student
P.Hone- 9251 7364
Appendix E. Plain Language Statement for Parents
Dear Parents,

My name is Kate Holt and I am currently enrolled in a Doctor of Health Psychology at Deakin University. As part of my degree, I am completing a research project under the supervision of Dr. Lina Ricciardelli, a Senior Lecturer in the School of Psychology.

The research involves the implementation of a prevention program aimed at promoting positive body image, self-esteem and healthy eating attitudes and behaviours in grade four children. The educational program aims to promote self-esteem and build resilience in children before the teenage years. In this way, the program aims to foster healthier lifestyles and decrease the risk of health problems in later life.

I am inviting all children from grade four from your child’s school to participate in this research. I write in hope that you will allow your child to take part in this research. The School Principal and the Education Department have given their approval for this research to take place.

The project will involve children completing a questionnaire, on six separate occasions, prior to the program, at immediate completion of the program, and at one, three, six and nine month follow-ups. The questionnaire will take approximately 45 minutes to complete. Children will also be participating in group activities incorporating role play, cooking activities, art and craft lessons and physical activities, on five separate one hour occasions. For example, the Healthy Bodies session encompasses increasing self-esteem and positive affect by acknowledging individual differences and the diversity of body shapes and sizes. Children will participate in cooking gingerbread boys and girls and in the creation of food sculptures whereby children will be encouraged to think about body diversity and personality characteristics. The completion of questionnaires and involvement in program activities all take place in class time. A copy of the questionnaire and program is available from your school principal. The questionnaire and program activities have been specifically designed for use with children.

Examples of the items on the questionnaire include:

- I am scared about being overweight?
- Does comparing your body with other children of the same sex usually make you feel better or worse about your body?
- I eat diet foods?

You can be assured that your child will not be identified by name in any way on their questionnaire, and only group data will be reported. The records of responses will be stored in a locked cabinet within the School of Psychology at Deakin University for a minimum period of SIX years from the date of publication. Your child will only be asked to volunteer to participate in the study with your permission. Children who agree to participate are free to withdraw from the study at any time. A summary of my findings will be provided to the school and available for any interested parents to read at the completion of the study.

This study may raise your child’s awareness of some of their own eating attitudes and behaviours as well as those of others. If you have any concerns, you can discuss these with the school counsellor or your own doctor. For any additional information about the research, please feel free to contact my supervisor, Dr. Lina Ricciardelli (Phone: 9244 6866) or myself (Phone: 9251 7364) at any time. If we are not in, please leave a message and we will return your phone call as soon as possible.

If you give permission for your child to participate in the study, please complete and sign the enclosed “Consent on Behalf of a Minor or Dependent Person” form and return it to the school. Your child’s participation will be greatly appreciated.

Thank you for your time.
Kate Holt.

Should you have any concerns about the conduct of this research project, please contact the Secretary, Ethics Committee, Research Services, Deakin University, 221 Burwood Highway, BURWOOD VIC 3125. Tel (03) 9251 7123 (International +61 3 9251 7123).
Appendix F. Consent Form on Behalf of a Minor
DEAKIN UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE
CONSENT ON BEHALF OF A MINOR OR DEPENDENT PERSON

I, 

of 

(suburb)

Hereby give consent for my son/daughter/dependent

to be a subject of a human research study to be undertaken by Kate Holt.

I understand that the purpose of the research is to implement a prevention program aimed at promoting positive body image, healthy eating attitudes and behaviours in children.

I acknowledge

1. That the aims, methods, and anticipated benefits, and possible hazards/risks of the research study, have been explained to me.

2. That I voluntarily and freely give my consent to my child's/dependant's participation in such research study.

3. I understand that aggregated results will be used for research purposes and may be reported in scientific and academic journals.

4. Individual results will not be released to any person including medical partitioners.

5. That I am free to withdraw my consent at any time, during the study in which event my child's/dependant's participation in the research study will immediately cease and any information obtained will not be used.

Signature: 

Date: 

NOTE: The parent or parents, or person(s) having guardianship of the child must sign the consent form.
Appendix G. Plain Language Statement for Children
Hello!

My name is Kate and I am doing a project on children and their thoughts on eating and their bodies. I'm here today to ask you some questions about you and your thoughts on eating. Next time I visit we will do different activities. For example, cooking, art and craft, and physical activities. If you don't want to answer the questions or do the activities then you are welcome to return to your classroom and do another activity with your teacher.

All the questions are in this booklet, and I would like you to answer them as I read them aloud. Just circle or tick the answer that you think best describes the way that you feel. There are lots of example questions that show you what to do, but if you are not sure just ask me!

This is not a test so there are no right or wrong answers. I am the only person who will see your booklet and you should not write your name on the booklet. If you don't want to answer a question then you can just leave it blank. OK? Good.

So please try and be as honest as you can and don't be afraid to ask for help if you don't know what to do. Oh, and if you feel uncomfortable while answering the questions or during the activities, please let me know and you can stop.

Thank-you!
Appendix H. Questionnaire
Children’s Eating Attitudes Test

Please circle the word that best describes the way you feel.
For example: I try to eat healthy foods

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

If you try to eat healthy foods most of the time you might circle VERY OFTEN. If you eat them at times, you might circle SOMETIMES. If you never eat healthy foods, you would circle NEVER.

1. I am scared about being overweight.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

2. I think a lot about wanting to be thinner.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

3. I think a lot about having fat on my body.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

4. I stay away from foods with sugar in them.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

5. I eat diet foods.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

6. I have been dieting.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

7. How often do you change your eating to lose weight?

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>

8. How often do you exercise to lose weight?

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
<th>Always</th>
</tr>
</thead>
</table>
9. I exercise to become more muscular.

   Never   Rarely   Sometimes   Often   Very Often   Always

10. I eat special foods or food high in calories in order to increase my muscles.

   Never   Rarely   Sometimes   Often   Very Often   Always

11. I worry about the size of my muscles.

   Never   Rarely   Sometimes   Often   Very Often   Always

12. I think a lot about the muscles on my body.

   Never   Rarely   Sometimes   Often   Very Often   Always

13. I think about increasing muscles when I exercise.

   Never   Rarely   Sometimes   Often   Very Often   Always

14. I am unhappy about the size of my muscles.

   Never   Rarely   Sometimes   Often   Very Often   Always

15. I give too much time and thought to changing my muscles.

   Never   Rarely   Sometimes   Often   Very Often   Always

16. I think that wanting to change my muscles controls my life.

   Never   Rarely   Sometimes   Often   Very Often   Always
Self-Description Questionnaire

Please circle the word that best describes the way you feel.
For example: I have lots of friends

<table>
<thead>
<tr>
<th>False</th>
<th>Mostly false</th>
<th>Sometimes False/ Mostlly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sometimes True</td>
<td></td>
</tr>
</tbody>
</table>

If you have lots of friends most of the time you might circle TRUE. If you have lots of friends sometimes you might circle MOSTLY TRUE. If you don’t have lots of friends you may circle FALSE.

1. I do lots of important things.

<table>
<thead>
<tr>
<th>False</th>
<th>Mostly false</th>
<th>Sometimes False/ Mostlly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sometimes True</td>
<td></td>
</tr>
</tbody>
</table>

2. In general, I like being the way I am.

<table>
<thead>
<tr>
<th>False</th>
<th>Mostly false</th>
<th>Sometimes False/ Mostlly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sometimes True</td>
<td></td>
</tr>
</tbody>
</table>

3. Overall, I have a lot to be proud of.

<table>
<thead>
<tr>
<th>False</th>
<th>Mostly false</th>
<th>Sometimes False/ Mostlly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sometimes True</td>
<td></td>
</tr>
</tbody>
</table>

4. I can do things as well as most other people.

<table>
<thead>
<tr>
<th>False</th>
<th>Mostly false</th>
<th>Sometimes False/ Mostlly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sometimes True</td>
<td></td>
</tr>
</tbody>
</table>

5. Other people think I am a good person.

<table>
<thead>
<tr>
<th>False</th>
<th>Mostly false</th>
<th>Sometimes False/ Mostlly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sometimes True</td>
<td></td>
</tr>
</tbody>
</table>

6. A lot of things about me are good.

<table>
<thead>
<tr>
<th>False</th>
<th>Mostly false</th>
<th>Sometimes False/ Mostlly True</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sometimes True</td>
<td></td>
</tr>
</tbody>
</table>
7. I'm as good as most other people.

False  Mostly false  Sometimes False/Sometimes True  Mostly True  True

8. When I do something, I do it well.

False  Mostly false  Sometimes False/Sometimes True  Mostly True  True

Feeling Scale

The following questions ask you about different feelings. Read each of the following questions and circle the word (Very Slightly, A Little, Moderately, Quite a Bit, Extremely) that best describes how you generally feel.

1. Interested

Very Slightly  A Little  Moderately  Quite a Bit  Extremely

2. Stressed Out

Very Slightly  A Little  Moderately  Quite a Bit  Extremely

3. Excited

Very Slightly  A Little  Moderately  Quite a Bit  Extremely

4. Upset

Very Slightly  A Little  Moderately  Quite a Bit  Extremely

5. Strong

Very Slightly  A Little  Moderately  Quite a Bit  Extremely

6. Guilty

Very Slightly  A Little  Moderately  Quite a Bit  Extremely
|   |  |  |  |  |  |
|---|---|---|---|---|
| 7. | Scarred | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 8. | Angry | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 9. | Eager | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 10. | Pleased | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 11. | Bad-tempered | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 12. | Wide-awake | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 13. | Ashamed | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 14. | Energetic | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
| 15. | Worried | Very Slightly | A Little | Moderately | Quite a Bit | Extremely |
16. Happy

<table>
<thead>
<tr>
<th>Very Slightly</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
</table>

17. Paying good attention

<table>
<thead>
<tr>
<th>Very Slightly</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
</table>

18. Jumpy

<table>
<thead>
<tr>
<th>Very Slightly</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
</table>

19. Active

<table>
<thead>
<tr>
<th>Very Slightly</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
</table>

20. Afraid

<table>
<thead>
<tr>
<th>Very Slightly</th>
<th>A Little</th>
<th>Moderately</th>
<th>Quite a Bit</th>
<th>Extremely</th>
</tr>
</thead>
</table>

**Social Comparison Practices - Children**

For the items below, circle the answer that best describes how often you compare these aspects of your body to those of other children of the same sex.

1. Would you describe yourself as someone who compares your body with other children of the same sex?

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
</table>

2. How often do you compare your weight to those of other children of the same sex?

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often</th>
</tr>
</thead>
</table>
3. How often do you compare your **upper body weight** to those of **other children of the same sex**?

Never | Rarely | Sometimes | Often | Very Often

4. How often do you compare your **lower body weight** to those of **other children of the same sex**?

Never | Rarely | Sometimes | Often | Very Often

5. How often do you compare your **muscles** to those of **other children of the same sex**?

Never | Rarely | Sometimes | Often | Very Often

6. How often do you compare your **muscle tone of your upper body** to those of other **children of the same sex**?

Never | Rarely | Sometimes | Often | Very Often

7. How often do you compare your **muscle tone of your lower body** to those of other **children of the same sex**?

Never | Rarely | Sometimes | Often | Very Often

8. How often do you compare your **height** to those of **other children of the same sex**?

Never | Rarely | Sometimes | Often | Very Often

9. Do you compare your **body** with other **children of the same sex** who you think have a **better** body than you?

Never | Rarely | Sometimes | Often | Very Often
10. Do you compare your body with other children of the same sex who you think have a worse body than you?

| Never | Rarely | Sometimes | Often | Very Often |

11. Does comparing your body with other children of the same sex usually make you feel better or worse about your body?

| A lot better | A bit better | No change | A bit worse | A lot worse |

Social Comparison Practices- Teenagers or Adults

For the items below, circle the answer that best describes how often you compare these aspects of your body to those of other children of the same sex.

1. Would you describe yourself as someone who compares your body with other teenagers or adults of the same sex?

| Never | Rarely | Sometimes | Often | Very Often |

2. How often do you compare your weight to those of other teenagers or adults of the same sex?

| Never | Rarely | Sometimes | Often | Very Often |

3. How often do you compare your upper body weight to those of other teenagers or adults of the same sex?

| Never | Rarely | Sometimes | Often | Very Often |

4. How often do you compare your lower body weight to those of other teenagers or adults of the same sex?

| Never | Rarely | Sometimes | Often | Very Often |
5. How often do you compare your muscles to those of other teenagers or adults of the same sex?

Never    Rarely    Sometimes    Often    Very Often

6. How often do you compare your muscle tone of your upper body to those of other teenagers or adults of the same sex?

Never    Rarely    Sometimes    Often    Very Often

7. How often do you compare your muscle tone of your lower body to those of other teenagers or adults of the same sex?

Never    Rarely    Sometimes    Often    Very Often

8. How often do you compare your height to those of other teenagers or adults of the same sex?

Never    Rarely    Sometimes    Often    Very Often

9. Do you compare your body with other teenagers or adults of the same sex who you think have a better body than you?

Never    Rarely    Sometimes    Often    Very Often

10. Do you compare your body with other teenagers or adults of the same sex who you think have a worse body than you?

Never    Rarely    Sometimes    Often    Very Often

11. Does comparing your body with other teenagers or adults of the same sex usually make you feel better or worse about your body?

A lot better    A bit better    No change    A bit worse    A lot worse
BOYS

Place an X under the picture you think looks the MOST LIKE YOU LOOK?

Place a □ under the picture that shows the way YOU WANT TO LOOK?
GIRLS

Place an X under the picture you think looks the MOST LIKE YOU LOOK?

Place a ✴ under the picture that shows the way YOU WANT TO LOOK?
Circle the responses that most relate to how you feel.

1. I think I am:  
   Fat  Skinny  In-between

2. I would like to:  
   Lose Weight  Gain Weight  Stay the Same

3. I would like to:  
   Lose Muscle  Gain Muscle  Stay the Same
ABOUT YOU!

CODE: .................................................................

SCHOOL: ..............................................................

AGE: ......................(in years)

GENDER (please tick): 

    BOY

    GIRL

HEIGHT: .........................cm

WEIGHT: .........................kg
Appendix 1. Baseline Preliminary Data Analyses

For the two-way condition by gender multivariate analysis of variance at baseline, the data were screened for missing values, univariate outliers, linearity, and normality. The assumptions were examined by group. The dependent variables included negative affect, positive affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction.

In an examination of the data by group missing values in all four groups were identified. Missing values were substituted with the mean score for the group determined via condition and gender. The data were converted to z scores or standardised scores to identify any univariate outliers. Two univariate outliers were found in the treatment condition for boys on measures pertaining to social comparisons and body dissatisfaction. One univariate outlier was found in the treatment condition for girls on the measure pertaining to muscle bulk and exercise. In the control condition, four univariate outliers were identified. Two univariate outliers were found in the control condition for boys on measures pertaining to self-esteem and muscle bulk and exercise. While, two univariate outliers were found in the control condition for girls on measures pertaining to dieting and body dissatisfaction. All outliers were recoded to within three standard deviations above or below the mean score determined by group.

Skewness and kurtosis were examined by group. While normality plots appeared non-normal, calculations of skew were all in the range of positive or negative three or four indicating that no transformations were necessary. It is important to note that with very small sample sizes graphs and plots will typically appear non-normal.

To examine for multivariate outliers and multicollinearity four regressions were computed. For the treatment condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there were no multivariate outliers in the gender groups. In addition, Cook’s Distance was less than one, indicating that there were no influential data points. There were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). Furthermore, analyses indicated that there were no problems with multicollinearity with
all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 11.5).

For the control condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there was one multivariate outlier in the boys group. The multivariate outlier was deleted from the data set. Cook’s Distance was less than one, indicating that there were no influential data points. Consistent with the treatment condition, there were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). Furthermore, analyses indicated that there were no problems with multicollinearity with all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 11.5).

Box’s M indicated that there was violation of the assumption of multivariate homogeneity of variance and covariance ($p < .000$). Levene’s assumption of homogeneity of variance was not violated for five dependent variables (negative affect, positive affect, self-esteem, dieting, and body dissatisfaction) at $p > .05$ level (Tabachnick & Fidell, 2001). Levene’s assumption of variance was, however, violated for the remaining two dependent variables (social comparisons and muscle bulk and exercise) at $p < .05$ level (Tabachnick & Fidell, 2001). Due to Box’s M violation of the assumption of multivariate homogeneity of variance, Pillai’s criterion, which is robust, was utilised to determine significant main and interaction effects.
Appendix J. Post-Program Preliminary Data Analyses

For the two-way condition by gender repeated measures multivariate analysis of variance from baseline to post-program, the data were screened for missing values, univariate outliers, linearity, and normality. The assumptions were examined by group. The dependent variables included negative affect, positive affect, social comparisons, self-esteem, dieting practices, muscle bulk and exercise, and body dissatisfaction.

In an examination of the data by group missing values in all four groups were identified. Missing values were substituted with the mean score for the group determined by condition and gender. The data were converted to z scores or standardized scores to identify any univariate outliers. Four univariate outliers were found in the treatment condition for boys on measures pertaining to positive affect, social comparisons, and body dissatisfaction (two univariate outliers). While, eight univariate outliers were found in the treatment condition for girls on measures pertaining to negative affect (two univariate outliers), social comparisons, self-esteem, dieting practices, muscle bulk and exercise, and body dissatisfaction (two univariate outliers). In the control condition, nine univariate outliers were identified. Six univariate outliers were found in the control condition for boys on measures pertaining to negative affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction. While, three univariate outliers were found in the control condition for girls on measures pertaining to dieting, muscle bulk and exercise, and body dissatisfaction. All outliers were recoded to within three standard deviations above or below the mean score determined by group.

Skewness and kurtosis were examined by group. While normality plots appeared non-normal, calculations of skew for all variables, except body dissatisfaction for the treatment girl condition, were in the range of positive or negative three or four indicating that no transformations were necessary. Body dissatisfaction for the treatment girl condition was examined and skew calculated to be +5.09. Examination of normality plots indicated evidence of a slight positive skew, however, a square root transformation was not conducted as the positive skew was understood to reflect the inherent nature of the variable. In addition, with very small sample sizes graphs and plots can appear non-normal.
To examine for multivariate outliers and multicollinearity four regressions were computed. For the treatment condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there was one multivariate outlier in the girls group. The outlier was subsequently deleted from the data set. Cook’s Distance was less than one, indicating that there were no influential data points. There were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). Furthermore, analyses indicated that there were no problems with multicollinearity with all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 10).

For the control condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there were no multivariate outliers in the gender groups. Furthermore, Cook’s Distance was less than one, indicating that there were no influential data points. Consistent with the treatment condition, there were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). In addition, analyses indicated that there were no problems with multicollinearity with all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 10).

Box’s M indicated that there was violation of the assumption of multivariate homogeneity of variance and covariance ($p = .000$). Levene’s assumption of homogeneity of variance was not violated for five dependent variables at baseline (self-esteem, negative affect, positive affect, dieting, and body dissatisfaction) and two dependent variables at post-program (positive affect and body dissatisfaction) at $p > .05$ level (Tabachnick & Fidell, 2001). Levene’s assumption of variance was, however, violated for the remaining two dependent variables at baseline (social comparisons and muscle bulk and exercise) and five dependent variables at post-program (self-esteem, negative affect, dieting, muscle bulk and exercise, and social comparisons) at $p > .05$ level (Tabachnick & Fidell, 2001). Due to Box’s M violation of the assumption of multivariate homogeneity of variance, Pillai’s criterion, which is robust, was utilised to determine significant main and interaction effects.
Appendix K. One Month Follow-Up Preliminary Data Analyses

For the two way condition by gender repeated measures multivariate analysis of variance from baseline to post-program to one month follow-up, the data were screened for missing values, univariate outliers, linearity, and normality. The assumptions were examined by group. The dependent variables included negative affect, positive affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction.

In an examination of the data by group missing values in all four groups were identified. Missing values were substituted with the mean score for the group determined by condition and gender. The data were converted to z scores or standardised scores to identify any univariate outliers. Six univariate outliers were found in the treatment condition for males on measures pertaining to negative affect, dieting, muscle bulk and exercise, social comparisons, and body dissatisfaction (two univariate outliers). Similarly, six univariate outliers were found in the treatment condition for girls on measures pertaining to negative affect, self-esteem, dieting, muscle bulk and exercise, positive affect, and body dissatisfaction. In the control condition, ten univariate outliers were identified. Seven univariate outliers were found in the control condition for boys on measures pertaining to negative affect, social comparisons, self-esteem, dieting, muscle bulk and exercise (two univariate outliers), and body dissatisfaction. While, three univariate outliers were found in the control condition for girls on measures pertaining to negative affect, dieting, and body dissatisfaction. All outliers were recoded to within three standard deviations above or below the mean score determined by group.

Skewness and kurtosis were examined by group. While normality plots appeared non-normal, calculations of skew for the majority of variables were in the range of positive or negative three or four indicating that no transformations were necessary. Body dissatisfaction and negative affect for the treatment girl condition were examined and skew calculated to be +5.79 and +6.61, respectively. Muscle bulk and exercise for the control boy condition was also examined and skew calculated to be +6.79. Examination of the three normality plots indicated evidence of slight positive skews, however, square root transformations were not conducted as the positive skews were
understood to reflect the inherent nature of the variables. In addition, with very small sample sizes graphs and plots can appear non-normal.

To examine for multivariate outliers and multicollinearity four regressions were computed. For the treatment condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there was one multivariate outlier in the boys group. The outlier was subsequently deleted from the data set. Cook’s Distance was less than one, indicating that there were no influential data points. There were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). Furthermore, analyses indicated that there were no problems with multicollinearity will all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 10).

For the control condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there were no multivariate outliers in the gender groups. Furthermore, Cook’s Distance was less than one, indicating that there were no influential data points. Consistent with the treatment condition, there were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). In addition, analyses indicated that there were no problems with multicollinearity will all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 10).

Box’s M indicated that there was violation of the assumption of multivariate homogeneity of variance and covariance ($p = .000$). Levene’s assumption of homogeneity of variance was not violated for 11 dependent variables (self-esteem, negative affect, positive affect, dieting, and body dissatisfaction at baseline, and self-esteem, positive affect, and body dissatisfaction at post-program and one month follow-up) at $p > .05$ level (Tabachnick & Fidell, 2001). Levene’s assumption of variance was, however, violated for the remaining ten dependent variables (social comparisons and muscle bulk and exercise at baseline, and social comparisons, muscle bulk and exercise, negative affect, and dieting at post-program and one month follow-up) at $p > .05$ level (Tabachnick & Fidell, 2001). Due to Box’s M violation of the assumption of
multivariate homogeneity of variance, Pillai's criterion, which is robust, was utilised to determine significant main and interaction effects.
Appendix L. Three Month Follow-Up Preliminary Data Analyses

For the two way condition by gender repeated measures multivariate analysis of variance from baseline to post-program to one month to three month follow-up, the data were screened for missing values, univariate outliers, linearity, and normality. The assumptions were examined by group. The dependent variables included negative affect, positive affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction.

In an examination of the data by group missing values in all four groups were identified. Missing values were substituted with the mean score for the group determined by condition and gender. The data were converted to z scores or standardised scores to identify any univariate outliers. Seven univariate outliers were found in the treatment condition for boys on measures pertaining to negative affect, self-esteem, dieting, muscle bulk and exercise (two univariate outliers), social comparisons, and body dissatisfaction. Six univariate outliers were found in the treatment condition for girls on measures pertaining to negative affect (two univariate outliers), self-esteem, muscle bulk and exercise, positive affect, and body dissatisfaction. In the control condition, nine univariate outliers were identified. Six univariate outliers were found in the control condition for boys on measures pertaining to negative affect, social comparisons, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction. While, three univariate outliers were found in the control condition for girls on measures pertaining to negative affect, dieting, and body dissatisfaction. All outliers were recoded to within three standard deviations above or below the mean score determined by group.

Skewness and kurtosis were examined by group. While normality plots appeared non-normal, calculations of skew for the majority of variables were in the range of positive or negative three or four indicating that no transformations were necessary. Body dissatisfaction and negative affect for the treatment girl condition were examined and skew calculated to be +7.26 and +6.09, respectively. Body dissatisfaction for the control boy condition was also examined and skew calculated to be +6.20. Examination of the three normality plots indicated evidence of slight positive skews; however, square root transformations were not conducted as the positive skews were understood to reflect
the inherent nature of the variables. In addition, with very small sample sizes graphs and plots can appear non-normal.

To examine for multivariate outliers and multicollinearity four regressions were computed. For the treatment condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there were no multivariate outliers in the gender groups. Cook's Distance was less than one, indicating that there were no influential data points. There were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). Furthermore, analyses indicated that there were no problems with multicollinearity will all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 10).

For the control condition, preliminary data analysis of Mahalanobis Distance, with a criterion of $p < .001$ and chi square value of 24.32, suggested that there were no multivariate outliers in the gender groups. Furthermore, Cook's Distance was less than one, indicating that there were no influential data points. Consistent with the treatment condition, there were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). Additional analyses indicated that there may be concern of multicollinearity will negative affect and self-esteem producing variance proportion scores of 0.70 and 0.77, respectively. However, all seven dependent variables in each group produced variance inflation scores less than ten (SPSS, Version 10).

Box's M indicated that there was violation of the assumption of multivariate homogeneity of variance and covariance ($p = .000$). Levene's assumption of homogeneity of variance was not violated for 14 dependent variables (self-esteem, negative affect, positive affect, and body dissatisfaction at baseline, and self-esteem, positive affect, muscle bulk and exercise, and body dissatisfaction at post-program, and self-esteem, positive affect, and body dissatisfaction at one month and three month follow-up) at $p > .05$ level (Tabachnick & Fidell, 2001). Levene's assumption of variance was, however, violated for the remaining 14 dependent variables (dieting, social comparisons, and muscle bulk and exercise at baseline, and social comparisons, negative affect, and dieting at post-program, and social comparisons, negative affect,
dieting, and muscle bulk and exercise at one month and three month follow-up) at $p > .05$ level (Tabachnick & Fidell, 2001). Due to Box’s $M$ violation of the assumption of multivariate homogeneity of variance, Pillai’s criterion, which is robust, was utilised to determine significant main and interaction effects.
Appendix M. Six Month Follow-Up Preliminary Data Analyses

For the two way condition by gender repeated measures multivariate analysis of variance from baseline to post-program to one month to three month to six month follow-up, the data were screened for missing values, univariate outliers, linearity, and normality. The assumptions were examined by group. The dependent variables included negative affect, positive affect, social comparisons, self-esteem, dieting practices, muscle bulk and exercise, and body dissatisfaction.

In an examination of the data by group missing values in all four groups were identified. Missing values were substituted with the mean score for the group determined by condition and gender. The data were converted to z scores or standardised scores to identify any univariate outliers. Four univariate outliers were found in the treatment condition for boys on measures pertaining to dieting, muscle bulk and exercise, body dissatisfaction, and social comparisons. Five univariate outliers were found in the treatment condition for girls on measures pertaining to negative affect (two univariate outliers), self-esteem, muscle bulk and exercise, and body dissatisfaction. In the control condition, five univariate outliers were identified. Four univariate outliers were found in the control condition for boys on measures pertaining to negative affect, self-esteem, muscle bulk and exercise, and body dissatisfaction. One univariate outlier was found in the control condition for girls on the measure pertaining to body dissatisfaction. All outliers were recoded to within three standard deviations above or below the mean score determined by group.

Skewness and kurtosis were examined by group. While normality plots appeared non-normal, calculations of skew for the majority of variables were in the range of positive or negative three or four indicating that no transformations were necessary. Body dissatisfaction and negative affect for the treatment girl condition were examined and skew calculated to be +5.91 and +5.68, respectively. Body dissatisfaction for the control boy condition was also examined and skew calculated to be +6.07. Examination of the three normality plots indicated evidence of slight positive skews, however square root transformations were not conducted as the positive skews were understood to reflect
the inherent nature of the variables. In addition, with very small sample sizes graphs and plots can appear non-normal.

To examine for multivariate outliers and multicollinearity four regressions were computed. For the treatment condition, preliminary data analysis of Mahalanobis Distance, with a criterion of \( p < .001 \) and chi square value of 24.32, suggested that there were no multivariate outliers in the gender groups. Cook’s Distance was less than one, indicating that there were no influential data points. There were no standardised residual values in excess of -3.3 and +3.3 (Tabachnick & Fidell, 2001). Furthermore, analyses indicated that there were no problems with multicollinearity will all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 10).

For the control condition, preliminary data analysis of Mahalanobis Distance, with a criterion of \( p < .001 \) and chi square value of 24.32, suggested that there were no multivariate outliers in the gender groups. Furthermore, Cook’s Distance was less than one, indicating that there were no influential data points. Consistent with the treatment condition, there were no standardised residual values in excess of \(-3.3\) and \(+3.3\) (Tabachnick & Fidell, 2001). Consistent with the treatment condition, analyses indicated that there were no problems with multicollinearity will all seven dependent variables in each group producing variance inflation factor scores less than ten (SPSS, Version 10).

Box’s M indicated that there was violation of the assumption of multivariate homogeneity of variance and covariance \( (p = .000) \). Levene’s assumption of homogeneity of variance was not violated for 23 dependent variables (negative affect, positive affect, body dissatisfaction, self-esteem, and dieting at baseline, positive affect, self-esteem, dieting, muscle bulk and exercise, and body dissatisfaction at post-program, positive affect, self-esteem, dieting, and body dissatisfaction at one month and three month follow-up and negative affect, positive affect, self-esteem, dieting, and body dissatisfaction at six month follow-up) at \( p > .05 \) level (Tabachnick & Fidell, 2001). Levene’s assumption of variance was, however, violated for the remaining 12 dependent variables (muscle bulk and exercise and social comparisons at baseline, negative affect and social comparisons at post-program, negative affect, muscle bulk and exercise, and
social comparisons at one month and three month follow-up, and muscle bulk and exercise, and social comparisons at six month follow-up) at $p < .05$ level (Tabachnick & Fidell, 2001). Due to Box's M violation of the assumption of multivariate homogeneity of variance, Pillai's criterion, which is robust, was utilised to determine significant main and interaction effects.