

**Aspects of body image perception of
preadolescent girls of different ethnic groups in
Northeastern Johannesburg, South Africa**

by
Lila Bruk

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degree Masters in Nutrition at the University of Stellenbosch*



Supervisor: Prof Demetre Labadarios
Co-supervisor: Prof Marietjie Herselman
Faculty of Health Sciences
Department of Human Nutrition

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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously, in part or in its entirety, submitted it at any university for a degree.

Signature:



L BRUK

Date: 24th August 2010

ABSTRACT

Background:

Poor body image perception and body dissatisfaction has been found to be a risk factor for eating disorders. Studies have found that signs of distorted body image perception and body dissatisfaction can be detected in children as young as 8 or 9 years old.

Aim:

The current study served to assess the extent of this problem in Northeastern Johannesburg, South Africa, in order to allow for the necessary intervention steps (e.g. development of school-based programmes) to deal with this problem to be put in place.

Method:

The study was a cross-sectional analytical study with a descriptive component. Two hundred and four girls (81.37% Black, 15.20% White and 3.43% Coloured or Indian) aged between 96 and 119 months in primary schools in Northeastern Johannesburg were selected for this study using systematic random sampling. They were required to complete a questionnaire about their body image perception and weight control behaviours, as well as undergo anthropometric measurements (i.e. weight and height).

Results:

This study found that the subjects placed much importance on being thin, with subjects stating that they thought if a girl was thin she would be more popular (63.96%), have better self esteem (69.63%), be more attractive (69.11%), be more feminine (73.80%) and be healthier (66.84%). When asked to identify the girl from a silhouette drawing that most resembled themselves, 45.00% of the subjects were able to accurately identify which girl's size most resembled their own, whereas 48.50% saw themselves as thinner than they are and 6.50% saw themselves as fatter than they are. In addition, the majority of subjects (69.61%) said that they were very happy with their weight and the majority (74.88%) classified it as "just right." However, despite these findings, there was still significant body dissatisfaction evident in the group with 50.25% of the subjects wanting to be thinner, 28.57% wanting to be fatter and only 21.18% not wanting to be thinner or fatter than they currently are. Of the subjects participating in the study, 50.98% had tried to lose weight in the past and 28.71% had tried to gain weight. Also, various factors (i.e. media, cultural, family and peer influences), were shown to have a significant influence on the subjects' body image perception. Other factors such as socioeconomic status and physical activity level had no significant link with the subjects' body image perception.

Conclusion: There is a significant problem with poor body image perception and resultant weight control behaviours in this age group. Clearly, there is a need for body image improvement programmes to be put in place in primary schools so as to prevent preadolescent girls from moving towards a lifetime of suffering with body dissatisfaction or, even worse, developing a life-threatening eating disorder.

OPSOMMING

Agtergrond:

'n Swak liggaamsbeeld en liggaamsontevredenheid is bekende risikofaktore vir die ontwikkeling van eetsteurnisse. Volgens studies kan tekens van 'n verwronge liggaamsbeeld en liggaamsontevredenheid reeds by jong kinders, van 8 of 9 jaar, bespeur word.

Doel:

Hierdie studie het gepoog om die omvang van dié probleem in die noordooste van Johannesburg, Suid-Afrika, te bepaal ten einde die nodige intervensiemaatreëls te tref (byvoorbeeld om skoolgebaseerde programme te ontwikkel) om die probleem die hoof te bied.

Metode:

Die studie is 'n dwarsnit analitiese studie met 'n beskrywende komponent. Met behulp van sistematiese, ewekansige steekproefneming is 204 laerskoolmeisies (81.37% Swart, 15.20% Wit en 3.43% Bruin of Indiër) van tussen 96 en 119 maande uit die noordooste van Johannesburg as proefpersone vir die studie gekies. Die meisies moes elk 'n vraelys oor hul liggaamsbeeld en gewigsbeheergedrag invul sowel as antropometriese meting van gewig en lengte ondergaan.

Resultate:

Die studie het gevind dat die proefpersone baie waarde daaraan heg om maer te wees. Hulle reken onder meer dat, indien 'n meisie maer is, sy waarskynlik gewilder sal wees (63.96%), 'n beter selfbeeld sal hê (69.63%), aantrekliker sal wees (69.11%), vrouliker (73.80%) en gesonder sal wees (66.84%). Toe hulle op 'n profielskets 'n meisie moes uitwys na wie hulle dink hulle die meeste lyk, kon 45.00% van die proefpersone akkuraat uitwys watter meisie se grootte die meeste met hulle s'n ooreenstem, terwyl 48.50% hulself as maerder en 6.50% hulself as vetter beskou het as wat hulle werklik is. Die meerderheid van die proefpersone (69.61%) was oënskynlik gelukkig met hul gewig en die meeste (74.88%) het hul gewig as "net reg" beskryf. Tog, ondanks dié bevindinge, was daar steeds beduidende liggaamsontevredenheid by die groep: 50.25% van die subjekte wil maerder wees, 28.57% vetter en slegs 21.18% nie maerder óf vetter as wat hulle tans is nie. Van die studiedeelnemers het 50.98% al voorheen probeer gewig verloor, terwyl 28.71% al probeer gewig aansit het. Verskeie faktore (soos media-, kulturele, gesins- en portuurinvloede) blyk ook 'n beduidende impak op die proefpersone se liggaamsbeeld te hê. Daarenteen toon ander faktore, soos sosio-

ekonomiese status en vlak van fisieke aktiwiteit, geen wesenlike verband met die proefpersone se liggaamsbeeld nie.

Gevolgtrekking: Hierdie ouderdomsgroep blyk 'n beduidende probleem met 'n gebrekkige liggaamsbeeld en gevolglike gewigsbeheergedrag te hê. Daar is duidelik 'n behoefte aan programme om laerskoolmeisies se liggaamsbeeld te verbeter ten einde te voorkom dat preadolesente meisies weens liggaamsontevredenheid 'n leeftyd van swaarkry tegemoetgaan of, selfs erger, 'n lewensgevaarlike eetsteurnis ontwikkel.

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DEFINITION OF TERMS

1. **Disordered eating** - term used to describe a wide range of irregular eating behaviours that cannot be classified necessarily as a certain eating disorder (e.g. anorexia nervosa). These eating behaviour irregularities may include skipping meals, experiencing guilt and/or self-loathing after eating, avoiding certain foods considered by the individual to be “fattening,” bingeing and/or self-starvation.¹⁻³
2. **Weight control behaviour** – behaviour to bring about a change of weight (e.g. dieting).¹
3. **Body image** – the internal view or perception and resultant emotional response one has of one’s physical appearance, including weight, body shape and physical attractiveness.⁴
4. **Body image perception** – the way in which one views oneself and one’s physical appearance.⁴
5. **Poor body image** – an inadequate and usually inaccurate view of one’s physical self and the resultant negative repercussions this has on one’s emotional wellbeing.⁴
6. **Body Dissatisfaction Score (BDS)** – this is a measure used in this study to determine the level of satisfaction the subject possesses with respect to her body. The Body Dissatisfaction Score (BDS) was calculated by determining the number of silhouettes that separate the silhouette the subjects considered to be ideal and the silhouette they felt most resembled them in Figure 2.2. Therefore, the higher the subjects BDS, the more dissatisfied the subjects are with their bodies. The BDS was adapted from a similar measure in Mciza *et al* (2005).⁵
7. **Bingeing** – the consumption of large amounts of food in a short space of time.⁶
8. **Anorexia nervosa** – an eating disorder characterised by an overwhelming fear of being overweight, a very low body weight due to self-induced weight loss (e.g. restrictive eating or excessive exercise), refusal to maintain a healthy body weight, a loss of the menstrual cycle (in women) and a distorted body image.⁶
9. **Bulimia nervosa** – an eating disorder characterised by an overwhelming fear of being overweight, cycles of bingeing followed by purging or other compensatory behaviours (e.g. vomiting, laxative or diuretic abuse, or excessive exercise as a means of attempting to rid the body of excess food or calories) and a feeling of lack of control around binges. Periods of bingeing and purging may be followed by periods of self-starvation.⁶

10. **Restrictive eating** – eating a reduced quantity of food, avoiding certain types of foods (e.g. high-fat or high-sugar foods), or refusal to eat at all (i.e. self-starvation). Restrictive eating can be considered a type of disordered eating behaviour.⁶

LIST OF ABBREVIATIONS

ANOVA – Analysis of Variance

BDS – Body Dissatisfaction Score

BMI – Body Mass Index

CDC – Centre for Disease Control

ChEAT – The Children’s Eating and Attitudes Test

DSM-IV-TR - Diagnostic and Statistical Manual of Mental Disorders Fourth Edition
(Text Revision)

EAT – Eating Attitude Test

EDNOS – Eating Disorder Not Otherwise Specified

HIV – Human Immunodeficiency Virus

ML – Maximum likelihood

PAL – Physical Activity Level

SD – Standard Deviation

SES – Socioeconomic status

WHO – World Health Organisation

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CHAPTER 1: INTRODUCTION AND MOTIVATION FOR STUDY

1.1 INTRODUCTION

Adolescence is the stage of life conventionally associated with disordered eating behaviour and a poor body image.⁷ Since adolescence is starting earlier in today's times, with the WHO classifying early adolescence as between 10 and 14 years of age, the period of preadolescence has also become earlier at approximately 8 or 9 years of age.⁸ There is much evidence to suggest that a distorted body image and disordered eating behaviour can both be found in preadolescent children as young as 8 years and, in some extreme cases, even 4 or 5 years of age.⁹⁻¹⁴ For example, a study by Li *et al* in China studied body image perception and satisfaction in 9100 children and adolescents between the ages of 3 and 15 years. They found that body dissatisfaction could present as early as age 5, with desire to lose weight being exhibited by boys at about age 11 and girls started younger with these feelings at age 9.¹³ Similarly Holub found that preschool children (i.e. age 4-6 years) exhibited negative perceptions of overweight individuals and showed awareness of their own body shape.¹⁴ This therefore suggests not only the need for an increased understanding and awareness of body image perception in younger children, but also the need for more interventions (e.g. school-based educational programmes) targeted at the preadolescent age group.

There is also the need to consider the cultural aspects around eating disorders, disordered eating patterns and body image perceptions. Whereas these behaviours were once deemed a concern limited exclusively to the Caucasian population, they are becoming increasingly apparent in other ethnic or racial groups in this country as well.¹⁵ One such study in South Africa by Mciza *et al* (2005) investigated body image of 9-12 year old girls of different ethnic groups, and developed and validated an instrument to measure body image perception in this group.⁵ A significant limitation of the study in this author's opinion is that it did not go into enough depth about the factors that affect body image development (e.g. influence of media and physical activity level). Another study did go into more depth about body image in the South African context, but focused on adolescent girls in the Western Cape.¹⁶ Overall, it is clear that there is a paucity of data on the situation of preadolescent girls in South Africa.

1.2 FACTORS ASSOCIATED WITH THE DEVELOPMENT OF POOR BODY IMAGE

1.2.1 Socioeconomic status (SES)

In Brazil, adolescent girls of a low socioeconomic status (SES) were shown to have a high incidence of disordered eating behaviours.¹⁷ In the United States, African American girls with a lower SES were found to have better body image perceptions than those with a higher SES as defined by assessments of the extent of their overweight concerns, body dissatisfaction and desired body shape, weight and height. On the other hand, White girls with a higher SES were found to have a better body image than those with a lower SES.¹⁸ However, in the South African context, a lower SES is associated with a better body image in preadolescent girls.⁵ The discrepancy between international data and local data further highlights the need to clarify the link between SES and preadolescent girls' body image perception in the local milieu.

1.2.2 Family's weight control behaviours and attitudes

Parents' weights have been found to be a strong predictor of whether children would be overweight. Children with an overweight mother or overweight father have been found to be 2.53 and 2.07 times respectively more likely to be overweight themselves.¹⁹ The stability of the home environment created by the parents has also been found to affect a child's eating and weight-related behaviours. It has been found that preadolescent girls with more parental conflict and less marital love in their family environments seem to be at greater risk of exhibiting dieting behaviours.²⁰ Also, children who eat more meals together with their family appear to be at a lower risk of being overweight. This is attributed to these children having more home-cooked meals rather than takeaways or other meals that are not home-cooked. Takeaways or restaurant meals are usually less nutritious than home-cooked meals. The children eating more home-cooked meals with the family were also found to develop better attitudes to food and nutrition.²¹

As mentioned previously, both parents' weights are a predictor of their child's weight and both parents are responsible for providing an environment that is stable and nurturing and thus conducive to the development of good eating behaviours. However, it appears that mothers

have the primary role in their children's body image development and perception. Studies have shown that although fathers, siblings and female friends appear to strongly influence adolescent girls' body image perceptions and dieting and eating behaviours, mothers have the strongest influence in this regard.²²⁻²³ Further, it has been found that mothers' own body image and weight concerns significantly affect their daughters' involvement in weight control behaviours, weight concerns and eating behaviours.^{5, 22, 24-26} Similarly, those mothers who restricted their daughters' eating to a greater extent were more likely to have daughters with a higher BMI and these daughters were also more likely to eat when they were not hungry. They were therefore eating for non-physiological reasons (e.g. emotional) reasons.²⁰ Also, mothers of preschool girls who had more concerns about their own weight, were the ones more likely to be concerned about their daughters' weight.²⁷ Body satisfaction may be related to daughters' attachment style to their mothers. Ogden and Steward found that daughters who were more dependent on their mothers had higher levels of body dissatisfaction and were more likely to diet.²⁴

A recent study by Kluck found that women with stronger body dissatisfaction and more disordered eating behaviours were also more likely to come from families with a strong focus on appearance (e.g. families where parents would comment frequently on body size or weight).²⁸

1.2.3 Influence of peers

Peers play a significant role in many aspects of a young girl's life, but one of the major areas of influence relate to body shape concerns and weight control behaviours.^{22-23, 29} Schur *et al* found that 29% of preadolescent girls had heard about dieting from their peers. There is some research to suggest that the influence which peers have in this regard exceeds that of the media and, in some cases, even of family members.^{7, 22, 29} This could be attributed to the high importance children place on the opinions of their peers. Some research suggests that the importance of peers in influencing a girl's body image increases as she progresses through adolescence.²²

1.2.4 Weight Control Behaviours

Dieting and other weight control behaviours have been identified as posing a great risk as regards encouraging the development of disordered eating.³⁰⁻³¹ Recent research conducted on males and females aged 9-14 years found that dieting was not only an ineffective means of weight control, but was in fact associated with weight gain. This weight gain was attributed to the children following bouts of highly restrictive eating interspersed with bingeing behaviours. This type of eating behaviour is considered to be symptomatic of disordered eating.³⁰

A study by Schur *et al* assessed the weight control behaviours and eating attitudes of children from Grades 3 to 6. The study found a high frequency of weight control behaviour in this group, with as many as 51.7% of girls wanting to lose weight and 41.9% of girls wanting to look thinner.²³ In a study by McVey *et al* it was found that 31.8% of 10 year old girls felt “too fat,” 30.8% of the total sample were currently trying to lose weight and 26.2% of the total sample wanted to be thinner.³¹ This highlights the need for more research to be done in this field to further clarify and understand this vulnerable, but often overlooked preadolescent group.

1.2.5 Cultural ideals of beauty

Altabe found that individuals of various ethnic groups showed similarities in what they considered to be the ideal physical traits (e.g. tall and thin). However, ethnic groups did differ with regard to body image satisfaction, with Caucasians and Hispanic-Americans showing more body image dissatisfaction than African-Americans and Asian-Americans. In general, African-Americans were found to have the most positive body images.³² This study therefore highlighted the need to consider various ethnic groups when investigating body image satisfaction in a selected population.

Similar results were found in other studies, even though the findings were not always the same.^{18, 33-34} For example, Neumark-Sztainer *et al* found that African-American adolescent girls exhibited less weight control behaviours and concerns than White adolescent girls. However, Hispanic, Asian American and Native American girls exhibited similar or even more weight control behaviours and concerns than their White counterparts.³⁴ Thompson *et al*

also found that Black preadolescent children showed greater body satisfaction than their White peers.³³ On the other hand, Robinson *et al* found that African American and Latina girls had either equivalent or greater body image concerns than White, Filipino and Asian American girls.¹⁸

Caradas *et al* examined eating attitudes and body image concerns in South African adolescent females. They found that although there were eating behaviour disturbances and body image issues across all ethnic groups, there were greater body image concerns in the White subjects in comparison with the Black and mixed ethnicity subjects. Also, the White subjects were found to feel that a thinner body ideal was more desirable.¹⁶

It is important to take into account the cultural attitudes towards certain conventionally defined eating disordered symptoms as these may have different definitions depending on the cultural milieu. For example, self-starvation may have cultural connotations not related to weight control per se (e.g. the individual may be fasting for religious reasons as a means of cleansing).¹⁵

1.2.6 Media

Cusamano studied the potential effects of media influences on the body image of 8-11 year old children. These effects included:

- How aware the subjects were of the media promoting a thin ideal
- The extent to which the subjects internalized the media's perception of the ideal standard of attractiveness.
- The importance the subjects attributed to the media as regards promoting the standard for attractiveness.
- Whether the subjects compared their bodies to those promoted by the media.
- The extent to which the subjects felt pressure from the media to look like celebrities or other well-known personalities.

The study found that both genders were influenced by media messages, but the girls had higher levels of body dissatisfaction and internalization of media messages than did the boys.³⁵ Other studies have found similar results in that the media strongly impacted on girls'

own body weight, body shape perception and exhibition of weight control behaviours.^{7, 22-23, 36-37}

Cusamano and Thompson developed a scale to assess the effect of media influence on body image perception in 8-11 year old children. They found that the female subjects appeared to be more affected by media influences compared to males.³⁵ Similarly, another study found that 69% of girls in grades 5 to 12 felt that fashion magazines influenced what they considered to be the ideal body shape and 47% felt that they wanted to lose weight as a result of the pictures in fashion magazines. It also appeared that girls who were more regular readers of fashion magazines were more likely to diet to lose weight.³⁷ Also, Schur *et al* found that 48% of preadolescent girls had heard about dieting on television – particularly in television advertisements.²³ Other research has also shown that media plays an important role in body image perception.²²

1.2.7 Level and type of physical activity

Research has shown that children who partake in regular physical activity have better body images. One such study by DeBate found that girls aged 8-12 years showed significant improvements in their self-esteem, body size satisfaction and eating attitudes and behaviours after undergoing a 12-week running programme.³⁸ Physical activity during childhood has also been shown to have positive effects on a woman's body image during adulthood.³⁹ Unfortunately, there is currently a widespread problem with inactivity in children – not only in Africa⁴⁰ but in many other parts of the world including the United Kingdom.⁴¹

Anderson *et al* and Gable *et al* reported similar results in that both found that children who spent more time watching television or sitting in front of the computer and thus less time being physically active, were more likely to have a BMI-for-age greater than the 95th percentile. This would classify them as significantly overweight or obese,^{21, 42} and therefore suggests that one could consider the participation in high levels of sedentary behaviours as a risk factor for overweight or obesity in children.

Girls aged 5-7 years participating in aesthetic sports (e.g. dancing, gymnastics and swimming), were more likely to experience body image and weight concerns than those participating in non-aesthetic sports (e.g. volleyball, soccer, basketball, softball, hockey,

tennis and martial arts) or no sport at all.⁹ This could be the result of higher pressure being placed on those participating in aesthetic sports as regards maintaining a certain body ideal and a slim physique to suit the body-conscious clothing these sports demand. Poudevigne *et al* found that girls aged 4-8 years did not necessarily present with significant body dissatisfaction at their first gymnastics class.⁴³ This could mean that the finding of higher levels of body dissatisfaction in children participating in aesthetic sports could be a result of their participation in and the inherent pressures of the sport, rather than their body image perceptions prior to initially participating in the sport.

1.2.8 Impaired self worth

Research has shown a positive link between poor self esteem and development of disordered eating behaviours in adults.⁴⁴ Similar results have also been found in children.⁴⁵⁻⁴⁶ For example, Hill *et al* found a significant correlation between the exhibition of weight control behaviours, a negative self worth and a poor body image perception in 8-year old children.⁴⁵ Similarly, Sharpe found that preadolescent (and adolescent) girls with an insecure attachment style and lower self-esteem were more likely to exhibit weight concerns.⁴⁶

Sinton and Birch found that 5 and 7 year old girls with higher levels of depression and lower general perceived self-competence, were more likely to exhibit dieting behaviours at age 9 years.²⁰

Israel and Ivanova investigated age and gender differences in self-esteem in overweight children (aged 8-14 years). They found that overall girls had a lower self esteem and lower body satisfaction than boys. Also, older children had a lower physical self-esteem than younger children. They found that those girls who were highly overweight had lower reported self-esteem than girls who were moderately overweight. However, highly overweight boys had a significantly higher physical self-esteem than moderately overweight boys.⁴⁷ This could be attributed to highly overweight boys being praised for their size in certain competitive sports (e.g. American football).

Stockton *et al* found that overweight preadolescent girls aged 8-10 years were more likely to have a poor body image and were at higher risk of taking part in weight control behaviours. They were also more likely to have lower self-efficacy than their healthier weight peers with

respect to being able to eat healthily and to be physically active.⁴⁸ Other studies have also found an increase in dieting behaviours, distorted body image perceptions and impaired self worth in those girls who are more overweight.^{7, 12, 20, 49-53}

1.2.9 Puberty

Puberty is a time of many body changes and events. One of the most significant of these events is menarche. A study of peripubertal adolescent girls by Abraham and O'Dea found that post-menarchial subjects had a greater likelihood than pre-menarchial subjects of attaching meaning to the concept of dieting and a greater likelihood of using diet and exercise as a means of losing weight. On the other hand, the pre-menarchial subjects who tried to lose weight did so for health reasons rather than having a clear understanding of the concept of dieting. This indicates that dieting and restrictive eating are most likely to become of increased interest at the onset of puberty rather than earlier. The investigators found a significant increase in dieting behaviours and negative self perception in post-menarchial girls in comparison with pre-menarchial girls. The investigators attributed these differences in perceptions to the increase in height, weight and body fat that precedes menarche precipitating greater body image awareness and a stronger desire to lose weight in the post-menarche stage.⁵⁴ This reinforces the role that the onset of puberty has in the development of a poor body image and disordered eating behaviours.

Jones *et al* found disordered eating behaviours and attitudes to be present in approximately 27% of girls aged 12-18 years, with a noted increase throughout adolescence.⁷ A longitudinal study by McCabe and Ricciardelli also found an increase in weight control behaviors in adolescent girls of a mean age of 12.89 years over a 16 month period to a mean age of 14.22 years.²² Carter *et al* found a high level of eating disorder behaviours in girls aged 12-14 years (with 8% of subjects being found to binge-eat).⁵⁵ Similar results of increased weight control behaviours as adolescence progressed have been found in other studies.^{31, 50}

Ohring *et al* found that girls who had gone through puberty earlier were more likely to have body dissatisfaction. This could be due to the fact that these girls have had the least time to develop emotionally and cognitively and are thus experiencing their body's changes in a different social context to their peers. As a result they may find their body satisfaction being negatively affected by their own responses and/or comment they receive from others.⁵⁰

This increase in body image concerns with increase in age amongst adolescents, may be attributable to increasing awareness of the sociocultural ideals of thinness and the related increased desire to attain this ideal.²²

1.2.10 Gender

Although there is research to show that both young boys and girls have body image issues,^{52, 56-57} there does appear to be a higher prevalence among young girls.^{12, 22, 33, 35, 47, 52-53, 57-59} Studies have also found that although both boys and girls exhibit increased body image concerns as they progress through adolescence, this increase is smaller in adolescent boys than in adolescent girls.²²

1.3 MOTIVATION FOR STUDY

1.3.1 The global context

Studies have been done around the world on the body image perceptions of preadolescent girls e.g. Sasson *et al* in Israel¹¹, Hill *et al* and Duncan *et al* in the United Kingdom^{45, 60}, Kelly *et al* in Australia⁵⁶ and Schur *et al* in the United States²³ also studied a similar, even if sometimes broader, age group to what is being dealt with in the study reported on in this thesis (Table 1.1). The overall sample composition in these studies was either similar, slightly different or broader, but still useful for comparison with the study documented here.

Table 1.1: International studies conducted on body image in preadolescent girls^{9, 11, 13, 23, 45, 56, 60}

Study	Country	Age group studied	Findings
Sasson 1995	Israel	Boys and girls in Grades 3-6 and Grades 7-11	Fifty-four percent of the total subjects in Grades 3-11 wanted to lose weight and 41.6% of the total sample exhibited weight control behaviours
Kelly 1997	Australia	Grades 2 and 4 (mean age 7.41 years and 9.38 years respectively) boys and girls	Poor body image was the major motivation for weight control behaviours in girls.
Hill 1998	United Kingdom	8-year old boys and girls	Eight-year old girls were drawn to weight control behaviours as a means of improving their self-worth.
Schur 2000	United States	Grades 3-6 (ages 8-13 years)	Fifty percent of children wanted to weigh less and 16% had already attempted weight loss. Majority of the children associated the word “dieting” with altering food choices and exercising habits, rather than with restricting one’s caloric intake. Seventy-seven percent of children had heard about dieting from a family member.
Davison 2001	United States	5-7 year old girls	Weight concerns were exhibited in girls aged between 5 and 7 years, but particularly in those participating in aesthetic sports.
Duncan <i>et al</i> 2004	United Kingdom	11-14 year old boys and girls	Body esteem and the subjects’ adiposity appeared to be negatively related. Boys’ body esteem was generally higher than that of girls.
Li <i>et al</i> 2005	China	3-15 year old boys and girls	Negative body image perceptions appeared to be correlated to the subjects’ BMI from age 5 years. Forty percent of the children were satisfied with their body size, with body dissatisfaction being more prominent in obese children and adolescents.

1.3.2 The African context

Adolescent females (aged 12-15 years) in Cameroon showed differences in their desired body shape based on their degree of urbanization and socioeconomic status. Girls from rural areas wanted to be “fat,” girls from urban poor areas wanted to be a “little bit fat” and girls from urban rich areas wanted to be “normal.” More specifically, there was the opinion amongst the girls from rural areas that “girls should be fat, not slim like a model.” In the urban poor areas, the girls exhibited a desire to be slightly overweight (i.e. the girls mentioned that they liked to

be “a bit fat”) and they said that they chose foods which would help them to achieve this body shape (i.e. high calorie foods such as chips and maize porridge). In the urban rich area, however, it was a different situation and the girls admitted restricting their food intake to control their weight and expressed a desire to be “normal” (i.e. not too thin or fat). Girls in the urban rich area also mentioned that they ate lemons to lose weight and avoided calorie-dense foods. In this group, keeping one’s weight in check was associated with “looking nice.” Therefore, it was concluded that even though those adolescents in rural areas still valued traditional body ideals of a larger, more rounded woman, the more Westernised adolescents were developing dieting behaviours and an increased desire to be thin.²⁶

A study was conducted on schoolchildren in the Nigerian town of Ile-Ife to determine the incidence and nature of name-calling and nicknames. Subjects were required to answer a questionnaire with details on the nature and frequency of name-calling that they experienced. It was found that 77.00% of the children involved in the study were called by nicknames, with 88.00% of the children being called these nicknames on a daily basis. Approximately a third of the nicknames related to the child’s appearance and 26.77% of the nicknames related specifically to the child’s weight.⁶¹

Also in Nigeria, a study was conducted by Salokun amongst 300 adolescent school children (i.e. 160 boys and 140 girls aged between 12 and 16 years) to look at preferred body shapes and stereotypes that may be associated with these body shapes by this age group. The subjects had to choose from a figure perception scale of six different body shape types – including thin, muscular and overweight. Subjects were then required to attribute various positive and negative attributes to the different body shapes (e.g. which body shape would make the worst athlete). Subjects were also required to choose which body shape most resembled their own and which they would most like to look like. It was found that 57.1% of the girls preferred a thin body shape. In addition, 28.6% of the girls that took part in the study were dissatisfied with their bodies and wanted to have a thinner body type. Both the boys and the girls that were involved in the study associated a more overweight body shape with poor intelligence, poor athletic ability and a likelihood of being more selfish. Although the thinner body shape was considered to be associated with higher intelligence, it was associated with poorer social skills. The muscular body shape was associated with higher intelligence and better social skills. It was concluded that the subjects generally attributed positive characteristics to body shapes they most admire and negative characteristics to those they least admire.⁶²

1.3.3 The South African context

South Africa presents a particularly interesting and unusual context in which to study body image as it is a developing country, yet sectors within it are strongly linked to Western culture and its norms. For this reason South Africa presents an intermeshing of traditional cultural body image perceptions combined with modern societal and media pressures.⁶³ For example, in many South African communities being very thin is considered to be an indication of being HIV-positive, whereas having a bigger body size is associated with being more wealthy and fertile and hence is considered more beautiful.⁶⁴ In this study by Puoane *et al* (2005)⁶⁴, forty-four female community health workers were interviewed on their opinions with regard to being overweight and issues surrounding overweight. It appeared that the general feeling amongst the women was that a body size that would result in a woman being classified as overweight (i.e. a BMI of 27kg/m²) was considered desirable. Similarly, the majority of the women were overweight or obese themselves. The women also expressed a general lack of interest in exercise if one is not trying to lose weight. Despite these results, a large proportion of the women attributed many positive attributes to a woman who is thin (e.g. more popular and better self-esteem) and more than half of the women admitted having tried to lose weight in the past. Similarly, a large proportion of the women felt that they would be healthier and more attractive if they were thinner.

Mciza *et al* (2005)⁵ developed and validated instruments, in the multi-ethnic South African context, to assess body image disturbances in girls of a similar age group (i.e. 8-12 year olds) to that covered by this study and their mothers. They developed a culturally sensitive series of silhouettes modified from a similar study⁶⁵ to determine body image satisfaction in the South African milieu. They found a general tendency for both Black mothers and their daughters to perceive a more overweight body size as “normal.” They also found that Black girls had less body image concerns and exhibited greater body image satisfaction than did their White counterparts. Their findings also suggested that Black girls received less peer and family pressure to be of a certain body size regardless of their current body size. Amongst Blacks, fewer women and their daughters were found to perceive a fat woman or girl to be unhappy in comparison with what was found amongst the other ethnic groups studied.⁵

There has also been research done on South African adolescents. Caradas *et al* found that 18.8% of adolescent schoolgirls (aged 15-18 years) had Eating Attitude Test (EAT) scores that suggested that they were suffering from eating disorders. The more overweight subjects were found to have a greater level of body dissatisfaction. When looking at the subjects' body image concerns, 33%, 26% and 20% of the White, Black and mixed race subjects respectively had an abnormal result indicating high body image concerns, thus these concerns were prevalent in all 3 ethnic groups, but particularly so in the White ethnic group. Black girls also were found to consider a larger body size as ideal in comparison to the other 2 groups. In addition, 27% of underweight girls and 33% of healthy weight girls displayed disordered eating behaviours and body image dissatisfaction.¹⁶

Therefore, many studies have been done on this subject in the global context, but less so in Africa and South Africa. There is clearly a need to thoroughly investigate body image perceptions and weight control behaviours in preadolescent girls (i.e. aged 8-9 years) within the South African context. In this way, high risk age and ethnic groups can be identified. Screening and intervention programmes can then be put in place at an early stage prior to intensification of the problems. Grade 3 girls aged 8 to 9 years from Northeastern Johannesburg were covered in this study, as this is an age at which the children would be considered preadolescent⁸ and at an age where they would be able to competently understand and interpret questionnaires.⁴⁵

1.3.4 Eating disorders and the risks thereof

1.3.4.1 Diagnostic criteria for Eating Disorders

The diagnostic criteria for eating disorders are specified in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR).⁶⁶ The main characteristic of anorexia nervosa is an overpoweringly strong drive to be thin. The symptoms of anorexia nervosa include the individual refusing to maintain a healthy body weight, having an overwhelming fear of gaining weight, having a distorted body image and showing signs of endocrinological disturbances (e.g. amenorrhoea in women). The disorder is usually manifested through a food consumption that is dramatically low in relation to their ideal caloric intake.

Individuals with bulimia nervosa also suffer a strong fear of weight gain but in addition they tend to have an overpowering and seemingly uncontrollable need to eat very large quantities of food (i.e. binge), with this being followed by compensatory or “purging” behaviours (e.g. vomiting, laxative or diuretic abuse, excessive exercise and/or self-induced starvation) to “rid” the body of the food.⁶⁶

Another disorder, binge eating disorder, is characterized by recurrent binge eating episodes, coupled with a feeling of a lack of self-control during these episodes and then experiencing significant distress after a binge. Therefore, binge eating disorder is similar to bulimia nervosa but there are no compensatory behaviours in place to prevent weight gain from the excess food and thus individuals that suffer from binge eating disorder are often obese.⁶⁶

Eating Disorder Not Otherwise Specified (EDNOS) is the term used for disordered eating behaviours which cannot be classified into any of the aforementioned eating disorder categories, but which still need to be addressed and treated. For example, an individual may exhibit all the diagnostic criteria of anorexia nervosa without being amenorrhoeic or an individual may have all the signs or symptoms of bulimia but may binge-eat very infrequently (e.g. once a month). These disorders are considered sub-threshold disorders and/or partial syndromes.⁶⁶

Although the DSM-IV-TR provides a useful source to identify and thus treat eating disorders, one must be aware that there is most likely to be a range of disordered eating behaviours that run the gamut from a strong concern for one’s weight to a full-blown diagnosed eating disorder.

1.3.4.2 Risk factors for eating disorders

Factors that increase the risk for an individual to develop an eating disorder include:

- Gender (i.e. eating disorders are more common in females)
- Ethnicity
- Early childhood eating problems/gastrointestinal problems
- High concern regarding weight
- Cultural or social emphasis on thinness

- Family influences
- Poor body image
- Sexual abuse
- General psychiatric illness
- Certain biological factors (e.g. genetic predisposition)
- Central nervous system serotonin activity alterations may affect eating behaviours directly, while simultaneously having a role in other psychiatric symptoms (e.g., depression).⁶⁷

1.3.4.3 Adverse effects of eating disorders

There are various adverse effects that can result from eating disorders.

Firstly, there are psychological or mental adverse effects of eating disorders. One such adverse effect would be that eating disordered patients have distorted perceptions of their body image. This has been attributed in part to disturbed brain activation patterns.⁶⁸ Individuals with eating disorders are also more likely to suffer from co-morbid psychiatric conditions (e.g. depression, paranoia, borderline personality disorders).^{67, 69}

Secondly, eating disorders may also have physical adverse effects which affect much of the body's systems and normal functioning (Table 1.2).

Poor body image perception is an independent predictor for the development of eating disorders.⁷⁰ Therefore, it is essential to identify high-risk individuals as early as possible, preferably from childhood. This will allow for the treatment or, ideally, the prevention of eating disorders thus limiting or preventing the individual from experiencing the emotional, mental and physiological distress that comes with eating disorders.⁶⁷

Table 1.2: Nutrition-related clinical signs commonly associated with anorexia nervosa and bulimia nervosa

Clinical signs	Anorexia nervosa	Bulimia nervosa
Electrolyte abnormalities	Hypokalaemia with refeeding syndrome; hypomagnesaemia; hypophosphataemia	Hypokalaemia accompanied by hypochloraemic alkalosis; hypomagnesaemia
Cardiovascular effects	Hypotension; irregular, slow pulse; orthostasis; sinus bradycardia	Cardiac arrhythmias; palpitations; weakness
Gastrointestinal effects	Abdominal pain; bloating; constipation; delayed gastric emptying; feeling of fullness; vomiting	Constipation; delayed gastric emptying; dysmotility; early satiety; oesophagitis; gastro-oesophageal reflux disease; gastrointestinal bleeding
Endocrine imbalances – reproductive, metabolic	Cold sensitivity; diuresis; fatigue; hypercholesterolemia; hypoglycaemia; menstrual irregularities	Menstrual irregularities; rebound fluid retention with oedema
Nutrient deficiencies	Protein-energy malnutrition; various micronutrient deficiencies	Variable
Skeletal and dental effects	Bone pain with exercise; osteopaenia; osteoporosis	Dental caries; erosion of the surface of the teeth
Muscular effects	Wasting; weakness	Weakness
Weight status	Underweight state	Variable
Cognitive status	Poor concentration	Poor concentration
Growth status	Arrested growth and maturation	Typically not affected

Source: Adapted from American Dietetic Association. Position of the American Dietetic Association: Nutrition intervention in the treatment of anorexia nervosa, bulimia nervosa, and other eating disorders; Reference⁶⁷

1.3.4.4 Treatment of eating disorders

Treatment of eating disorders must involve a multidisciplinary team including a physician, psychologist and dietician.⁶⁷ Cognitive behavioural therapy, psychopharmacologic therapy, medical treatment of symptoms (e.g. low bone density)⁷¹ and medical nutrition therapy (i.e. nutritional assessment of the individual, recommendations and subsequent implementation of the prescribed nutritional intervention) must all form part of the therapeutic approach.⁶⁷

1.3.5 Impetus for the study

Poor body image perception⁷⁰ and the accompanying low self esteem⁴⁵⁻⁴⁶ is a risk factor for the development of eating disorders. Eating disorders are no longer exclusive to affluent, Westernised communities, but now are becoming increasingly more prevalent in developing countries.^{5, 16, 26, 62, 64} Eating disorders have many dire health consequences⁶⁷ and therefore distorted body image perceptions and disordered eating behaviours need to be addressed and prevented before the individual develops an eating disorder. This study hopes to clarify the situation in Northeastern Johannesburg with respect to body image perception in preadolescent girls and in turn provide data on a relatively under-researched population. This data can then be used as a motivation and starting point for future intervention programmes in schools and other institutions so as to address and manage this issue and to decrease the incidence of eating disorders in the South African context.

CHAPTER 2: METHODOLOGY

2.1 AIM

To assess, define and describe the weight control behaviours and body image perception of 8-9 year old preadolescent girls of different ethnic groups in Grade 3, in the Northeastern area of Johannesburg, South Africa and identify factors that impact on these aspects.

2.2 SPECIFIC OBJECTIVES

1. To assess the learners' body image perception with specific emphasis on differences between the ethnic groups in this respect.
2. To examine how the learners perceive body shape and size in relation to their peers and other girls their own age
3. To compare learners' body image perception with anthropometric data
4. To investigate selected factors that may affect the subjects' body image, including:
 - Socioeconomic status
 - Parents' weight control behaviours and attitudes towards eating and weight
 - Subjects' weight control behaviours
 - Influence of peers
 - Societal influences (i.e. media and cultural influences)
 - Physical activity level

2.3 NULL HYPOTHESES

1. There is no significant difference in body image perception between subjects of different ethnic groups.
2. There is no significant relationship between the learners' anthropometric status and their body image perception.
3. The aforementioned factors stated in Section 1.2 play no role in the development of distorted body image perception or weight control behaviours in this age group.

2.4 STUDY PLAN

2.4.1 Study design

The study was a cross-sectional analytical study with a descriptive component.

2.4.2 Study population

The study population was preadolescent girls of all ethnic groups in Grade 3 aged from 8 years (i.e. 96 months) to 9 years/below 10 years (i.e. to 119 months) in Northeastern Johannesburg (Region E of Figure 1)⁷² in South Africa.

2.4.3 Inclusion criteria

1. South African children attending primary school – both government and private schools
2. School in Northeastern Johannesburg area
3. Female learners
4. In Grade 3
5. Between the ages of 8 and 9 (i.e. between the ages of 96 months and 119 months)

2.4.4 Exclusion criteria

1. Learners attending “special-needs” schools and all-boy schools
2. Learners whose parents did not give consent for the learner to participate, or learners who did not give assent themselves to participate in the study.

2.4.5 Selection of sample

Northeastern Johannesburg (Region E of Figure 2.1) was chosen as the area to be investigated for this study, as it is a culturally diverse area with socioeconomic extremes – ranging from the very wealthy to poverty-stricken. There is a mix of well-paid professionals, middle class individuals and lower-paid labourers. High levels of unemployment are found in this region – especially in the informal settlement Alexandra. In Region E, 87% of the population are

Black, 11% are White, 1% Indian and 1% Coloured. This is similar to the ethnic distribution of Johannesburg as a whole (i.e. 74% Black, 20% White, 4% Coloured and 3% Indian and Asian).⁷⁵ A list of all primary schools ($N = 66$) in Northeastern Johannesburg area was obtained from the Gauteng Department of Education. Of the 66 schools, 13 (19.67%) were excluded as they met the exclusion criteria namely special needs schools (23.08%, $N = 3$) and all boys schools (76.92%, $N = 10$). Therefore 53 of the 66 (80.30%) schools were considered eligible for inclusion in the study. The schools (15.09%, $N = 8$) that were chosen to take part in the study were selected through systematic random sampling.

From the list of 53 schools, every fifth school was initially selected with the aim being to select at least 10 schools. Of the 10 selected in this first round, 3 schools agreed to take part. A random starting point was then taken for a second round and once again every fifth school was selected. A total of 3 rounds of systematic random sampling in this manner were required to make up the final number of schools ($N = 8$). The investigator contacted each school selected to participate in the study via telephone. The investigator explained to each of the selected schools' headmasters the logistics of the study and what would be required of the school, the teachers and the learners themselves. In the case of two of the schools, it was requested that the details of the study were also discussed with the school social worker. Of the 8 schools selected 2 schools were private schools and 6 were government schools. At each selected school, all Grade 3 assenting female learners who met the selection criteria and whose parents provided consent were included in the study.

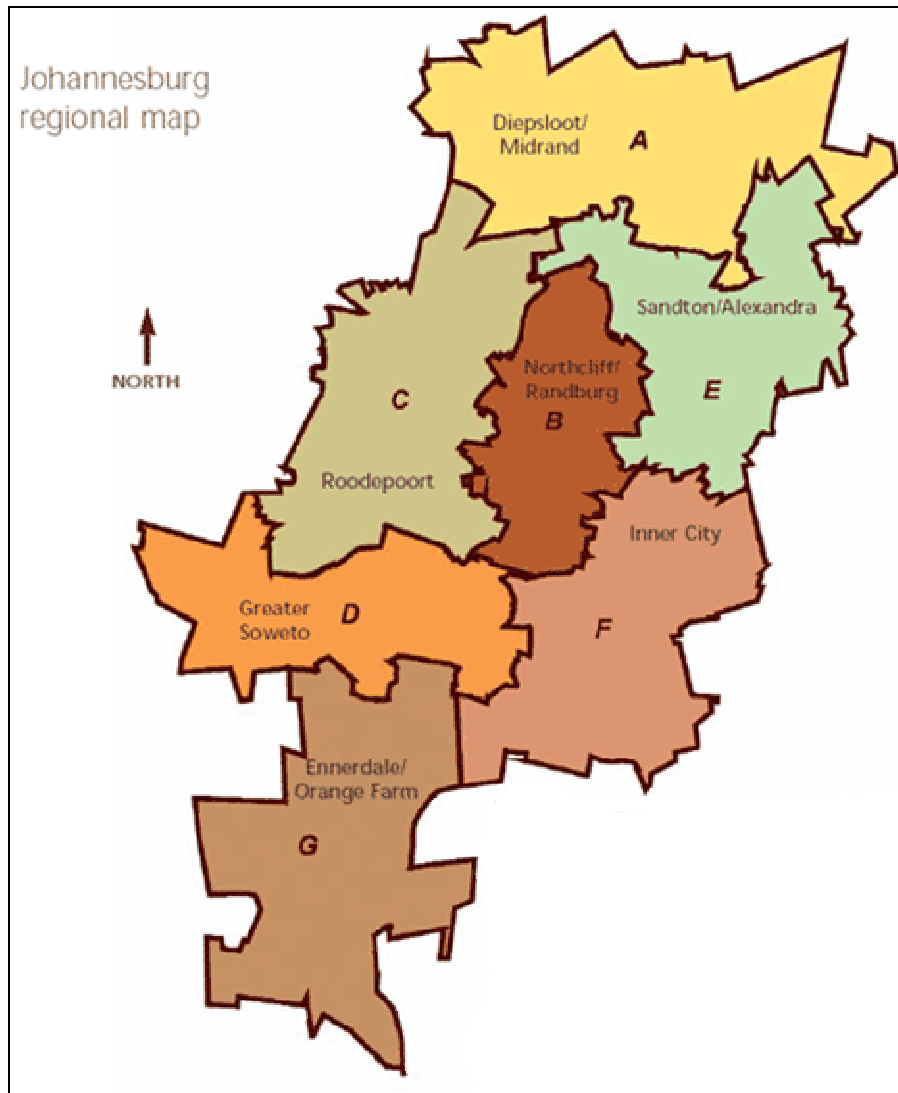


Figure 2.1: Regional map of Johannesburg⁷² – Region E was studied

2.4.6 Sample size

The sample size required to obtain an error of 5% within a confidence level of 95% was 385 learners. The final size included was 204 learners from a total of 8 schools. The final number of subjects included was less than initially planned due to the limited number of schools being prepared to take part.

2.5 MEASUREMENTS PERFORMED

This study had two main data-yielding components. The first component involved a questionnaire, which was administered by the investigator but involved self-completion by the subjects. The second component involved anthropometric measurements which were

performed by the investigator. Both the questionnaire administration and the anthropometric measurements took place, during the same session, at the subjects' school at a time approved by the school. Usage was made of either the school's hall or a classroom where noise levels were low and there were no other disturbances. In each participating school, all eligible female learners from all Grade 3 classes participated in the study. On average there were three Grade 3 classes per school and 15 to 30 learners per class, but not all were eligible (e.g. some were too young, some too old, some did not have parental approval and some did not want to participate). Therefore, on average 26 children per school were involved in the study. The questionnaire was written and administered in English, as the investigator established from all the schools involved that English is understood comfortably and spoken well by the subjects.

The investigator read each question to the subjects as a group so as to keep their attention focused on the questionnaire. All queries were answered. The investigator ensured that each question was answered in full by each student before moving on to the next question. In most cases a teacher or school counselor was present to maintain order while the research process took place. To prevent unintentional bias being incurred, these school staff members were not allowed to address any queries from the subjects.

The questionnaire took approximately 30 to 40 minutes to complete. After completion by all subjects, heights and weights were measured and recorded for all. The total time taken to complete the questionnaire and for the investigator to take the measurements was approximately 80 minutes for approximately 26 children. The questionnaire and anthropometric data comprised the variables for data analysis.

2.5.1 Questionnaire

The questionnaire (Appendix 1) was used to assess the various factors that positively and negatively affect the subjects' body image (e.g. media, cultural ideals, socioeconomic status, peer influences and familial influences) so as to determine the extent of their effect on body image perception in the age group covered in this study.

The questionnaire was comprised of modified versions of three questionnaires, which had been used in other studies. These three questionnaires had previously been utilized and validated in the age group dealt with in this study:

- Questionnaire measuring body image and body dissatisfaction in young girls aged 8 – 12 years ⁵
- The Children's Eating and Attitudes Test (ChEAT) ⁷³
- Physical Activity Questionnaire ⁷⁴

Face validity of the questionnaire was tested in the pilot study. It was found from the pilot study that certain words or concepts in the questionnaire were not well-understood by the subjects. This led to certain questions being poorly-answered, thus affecting the face validity. As a result, certain questions were re-worded (Appendix 2). For example, many subjects interpreted “diet” as “died” and this affected the way they answered the question. Questions with the word “diet” were thus reworded appropriately with “diet” being replaced with “lose weight” or “weight loss” depending on the context.

Also, there was omission of questions which most of the subjects simply did not know the answers to. For example, a question in the original questionnaire dealt with the educational level of the subjects' parents as part of the determination of SES. It was found in the pilot study that most of the children were unable to answer this question since they did not know this detail about their parents. In addition, questions about the number of people living in the subjects' house and how many siblings the subjects had also addressed SES. Therefore this question was considered superfluous and was omitted from the questionnaire.

It also appeared that some subjects found the questionnaire too long. There was thus omission of some questions (as detailed in 2.6) so as to reduce the length of the questionnaire and thereby reduce respondent fatigue and possible fatigue-related bias in the results.

The questionnaire was divided into the 6 sections discussed below.

2.5.1.1

SECTION 1: Socioeconomic status

Socioeconomic status was measured through the administered questionnaire by asking subjects questions (in Section 1) relating to their living conditions i.e. questions on how many people live in their households with them and how many siblings they have. Household size and number of offspring have both been found to be linked to socioeconomic status.^{75, 76, 77, 78}

2.5.1.2

SECTION 2: Body image Perception and Body Shape Satisfaction

Body image Perception was measured in Section 2 via a modified version of the questionnaire devised and validated by Mciza *et al* (2005) for assessing body image perception in 8 to 12 year old girls in the South African context.⁵ The questionnaire used in the Mciza study was adapted from the one used in the American Indian Pathways Study for girls (Stevens in Mciza).⁵ The Mciza study made it more culturally sensitive in the South African context and there was also inclusion of questions derived from focus group discussions held in the Cape Metropole Area of South Africa.⁵

Included in the Mciza *et al* study, was a scale (Figure 2.2), originally developed for the Pathways study.⁶⁵ This was a visual silhouette perception scale used to assess the subjects' perception of themselves versus their true body shape as determined by their body mass index (BMI).

Since this scale proved to be particularly useful in other similar studies,^{5, 79} it was utilized in the Northeastern schools study reported on in this document. More specifically, in this study, the subjects' body image perception and degree of body shape satisfaction was measured through the visual silhouette perception scale shown in Section 2 of the questionnaire. The silhouettes are marked from *Silhouette A* (thinnest) to *Silhouette H* (most overweight).

Using the scale (Figure 2.2), each subject was required to select the silhouette which she felt looked most like her (question 2.3) as well as the silhouette that represented what she would most like to look like (question 2.4).^{70, 80} Using this information, the *Body Dissatisfaction Score (BDS)* could be calculated. The BDS measures the level of the subject's satisfaction with respect to her body, based on the difference between the silhouette the subject considers ideal and the silhouette she feels most resembles her.

The greater the body dissatisfaction the higher would be the score (i.e. higher towards the negative side the more she wants to be thinner and higher to the positive side the more she wants to be fatter). A score of zero would mean total body satisfaction and therefore the more satisfied the subject is with her body, the closer to zero would be her score. Clearly, a

negative BDS would imply that the subject wants to lose weight, whereas a positive BDS would imply that she wants to gain weight. For example, if the subject feels that she looks most like *Silhouette E* (BMI category 3 – at a healthy weight), but would most like to look like *Silhouette A* (BMI category 1 – underweight) then the BDS would be -4.

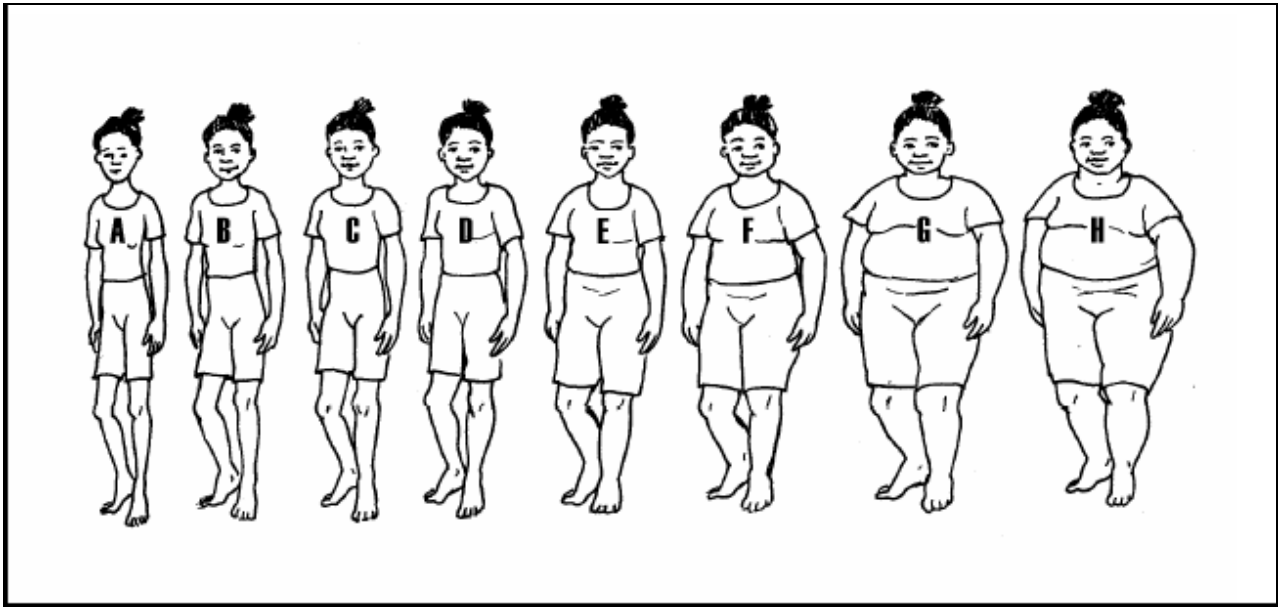


Figure 2.2: Silhouette Perception Scale

Source: Mciza *et al* (2005)⁵

In the study by Mciza *et al* (2005)⁵, the WHO BMI percentiles from the CDC 2000 growth charts⁸² were used to correlate the silhouettes with a specific BMI-for-age percentile and in turn to assign the appropriate weight designation. These weight designations were adapted for use in the study (Table 2.1 below). This was done to allow for comparison between the silhouette each subject thought she looks like and the silhouette her BMI-for-age classified her as.

Table 2.1: BMI-for-age percentiles and weight designation in relation to Silhouette Perception Scale

Silhouette	Position on BMI-for-age chart	Weight designation	BMI category
<i>Silhouette A</i> (i.e. BMI category 1 – underweight)	<5 th percentile (BMI <18.5 kg/m ²)	Underweight	1
<i>Silhouettes B</i> (i.e. BMI category 2 – at risk of underweight) & <i>C</i> (i.e. BMI category 2 – at risk of underweight)	5 th to 15 th percentiles (BMI = 18.5-19.9)	At risk for underweight	2
<i>Silhouettes D & E</i>	15 th – 85 th percentile (BMI = 20-24.9 kg/m ²)	Healthy weight	3
<i>Silhouettes F</i> (i.e. BMI category 4 – at risk of overweight) & <i>G</i> (i.e. BMI category 4 – at risk of overweight)	85 th -95 th percentile (BMI = 25-29.9 kg/m ²)	At risk for overweight	4
<i>Silhouette H</i> (i.e. BMI category 5 – overweight)	= >95 th percentile (BMI >30 kg/m ²)	Overweight	5

Source: Adapted from Mciza *et al* (2005)⁵

Construct validity, concurrent validity and reliability of the adapted questionnaire used in the Mciza study, were assessed in the Mciza study⁵ in the following ways:

1. Comments from the Mciza focus groups were taken into account and their responses were assessed in the context of their ethnicity. The girls' attitudes towards their body image were compared to responses from focus groups.⁵
2. Cronbach's alpha was used to test for internal reliability and consistency of the scales used to test the girls' belief constructs that they were thin, as well as their belief constructs that they were fat. Cronbach's α was found to be 0.8 and 0.7 for the "thin" and "fat" belief constructs respectively.⁵

In the study by Mciza *et al* a significant positive correlation ($P < 0.05$) was found between the girls' actual anthropometric data and the silhouettes that they chose to represent the way they perceived themselves.⁵

2.5.1.3

SECTION 3: Family and peer influences

In this study, subjects were asked in Section 3 of the questionnaire (questions 3.1 – 3.10, 5.1, 5.2 and 5.5): whether their parents, other family members and peers had ever been on a diet; whether they feel that these individuals would prefer them (i.e. the subjects) to have a different body shape (i.e. thinner or fatter); how they personally feel their weight affects them socially (e.g. whether a girl who is more overweight is more likely to be unpopular); and whether they feel pressure from their peers to attain a certain body weight.

The questions in Section 3 are sourced from those in the Mciza⁵ and ChEAT⁷³ questionnaires and were validated by Mciza⁵ and Maloney⁷³, as discussed in Section 2 above and Section 4 respectively below.

2.5.1.4

SECTION 4: Weight Control Behaviours

Weight control behaviours were assessed, in section 4 of the questionnaire, by means of a modified version of the Children's Eating Attitudes Test (ChEAT).⁷³ The ChEAT is the children's version of the adult Eating Attitudes Test (EAT).

The ChEAT questionnaire addresses and investigates weight control behaviours, bulimic or anorexic tendencies or behaviours, food preoccupation and weight preoccupation in children. Children are also asked whether they have used weight control methods such as exercising, skipping meals, eating less at meal or snack times and avoiding starchy or sweet foods.^{70, 80}

Maloney *et al* validated the ChEAT in boys and girls in grades 3 to 6 aged between 7 and 13 years, by comparing the test-retest coefficient (+0.81, $N = 68$) and internal reliability coefficient (+0.76, $N = 318$) of the ChEAT with those found in studies relating to the EAT. The Cronbach's α for the total sample ($N = 318$) was found to be +0.76.⁷³ Therefore, the ChEAT is indeed reliable, as although a Cronbach's alpha over +0.8 is considered ideal, a value above +0.7 is deemed acceptable.⁸³

The ChEAT was further evaluated by Smolak and Levine using a sample of Grades 6 to 8 girls. It was found to have internal reliability with the Cronbach's α (+0.88, $N = 308$) for the three grades tested and was found to be significant ($p < 0.001$). The test was also found to have concurrent validity as there was a significant correlation between the questionnaire score and weight control behaviours ($r = +0.37$, $p < 0.001$) as well as body dissatisfaction ($r = +0.40$, $p < 0.001$).^{70, 80}

The ChEAT has also been found to successfully predict a significant correlation⁸³ in body image disturbances and weight control behaviours in girls in Grades 2 to 4 ($R^2 = 0.30$, $p < 0.01$, $\beta = 0.53$, $p < 0.05$).⁵⁶

2.5.1.5

SECTION 5: Cultural and media influences

Section 5 of the questionnaire addressed the issue of cultural influence on the subjects' body image. Cultural influences were assessed according to the proportion choosing each body shape from the Silhouette Perception Scale as "ideal" and how the results differed when analysed by ethnic group, as well as how the subjects ascribed positive and negative attributes to an individual based on body size.

Media influences were also measured in Section 5 of the questionnaire, through questions relating to the effect of magazines and television on perception of beauty and body shape ideals. The effect of the media on the subjects' body image perception could be determined, in relation to their ethnic group as well as in relation to the study population as a whole.

The questions used in Section 5 were validated in the Mciza *et al* (2005)⁵ study. However, some of these questions were modified by altering the wording of the questions to make them clearer and easier to understand for the specific age group covered in the current study. The modified version of these questions was further tested for face validity in the pilot study.

2.5.1.6

SECTION 6: Physical activity level (PAL) and aesthetic sports

Physical activity level (PAL) was measured, in section 6 of the questionnaire, through a modified version of the Physical Activity Questionnaire used by McVeigh *et al* (2004)⁷⁴ amongst 9-year old South African children.⁷⁴ The McVeigh Physical Activity Questionnaire was based on two previously validated questionnaires^{84, 85} The McVeigh Physical Activity Questionnaire was modified to be suitable for South African children by considering sports common to South Africa and also the cultural milieu in South Africa. For example, questions on transport were modified to take into account that many children travel by taxi to school. Physical education in schools was also included and the informal activity sport types were also modified. The McVeigh Physical Activity Questionnaire was validated by using accelerometers as a proxy for physical activity in children and was used successfully in the Birth to Twenty birth cohort study in South Africa.⁷⁴

Section 6 of the questionnaire addresses both formal and informal physical activity which the subjects may perform, as well as any sedentary, low physical level behaviours, if any, they regularly exhibit (e.g. watching large amounts of television).⁸⁶ Formal physical activity would include organized, scheduled and regular physical activity sessions at school or otherwise. Informal physical activity would include such activities as playing outside and riding a bike.

Based on assessment of all these activities, each child's physical activity level could be scored and quantified. Children could thus be classified into low, medium or high levels of physical activity categories according to the trends that emerge. Those taking part in formal and/or informal physical activity more than four times per week were classified as exhibiting a high level of physical activity. Those participating in formal and/or informal physical activity three to four times a week were placed in the medium level category. The low level category comprised those participating in formal or informal physical activity less than three times per week and/or those participating regularly in sedentary activities. The correlation between level of physical activity and body image perception and body shape satisfaction could then be determined.

The effect of type of sport (i.e. aesthetic vs. non-aesthetic) on body image perception was measured in Question 6.5 of Section 6, by asking the subjects what sports they play.

Correlations could thus be established between different types of sports and body image perception. It could therefore be determined whether those subjects that were involved in aesthetic sports (e.g. dancing or gymnastics) have poorer body image perceptions than their counterparts not involved in these types of sport.

When the questionnaire for this study was pilot tested, this section of the questionnaire (i.e. Section 6) was not as well-understood by the subjects as were some of the other sections. It was recognized that, rather than question changes, further explanation and clarification were necessary here. This ensured that this section could be adequately answered. The investigator was thus able to implement the required explanations and clarification when administering the final questionnaire to the subjects.

2.5.2 Anthropometric measurements

The investigator measured the subjects' weight and height using standard equipment and standardized techniques.⁸⁷ To improve the reliability of the height and weight measurements, and to limit intra-observer variability, height and weight were both measured twice. For each subject the average of the two weight measurements and the average of the two height measurements were recorded. All measurements were performed by the investigator to prevent inter-observer variability. All measurements were performed during the session at which the questionnaire was administered.

2.5.2.1 Weight

A standardized electronic scale (Tanita Innerscan) was used for the weight measurement. This enabled measurement of the subjects' weights within 0.1 kg. In order to standardize and improve the validity of the measurements, the subjects were required to keep their school uniforms on, but to remove their shoes and all extra layers of clothing (e.g. jerseys).⁸⁷

2.5.2.2 Height

Subjects' heights were measured using a non-flexible tape measure affixed to a flat wall. Height was measured in the unit of metres to the nearest 0.01m. Once again, to improve the

validity and accuracy of the measurements and to standardize, any ponytails or hair accessories were removed before commencing the measurement.⁸⁷

2.5.2.3 Body Mass Index (BMI)

The BMI was calculated for each subject using her weight and height data and applying the standard formula: $BMI = \text{weight(kg)}/\text{height(m)}^2$.^{8, 86} The CDC Growth Charts 2000 BMI-for-age percentile charts⁸² were utilized as a reference.

2.6 PILOT STUDY

A pilot study was conducted prior to initiating the formal study in order to identify any potential sources of error or complications that may arise during the implementation of the study and to check the questionnaire for face validity. The pilot sample ($N = 15$) was drawn from the study population. These subjects were not included in the final study sample, as there was a difference between the pilot version of the questionnaire and the final version used in the study. This pilot sample comprised 15 participants from a Grade 3 class of one of the listed Northeastern Johannesburg schools and these participants fulfilled the study's inclusion and exclusion criteria.

The responses on the questionnaire were assessed for their relevance in the context of the study and to ensure that the aforementioned variables of interest were being suitably addressed. As a result of the pilot study, various changes were made to the questionnaire to improve the potential accuracy of the data to be gathered in the formal study. These changes involved simplifying the language thus making it easier for the children to understand and also omitting questions that were superfluous. In addition, certain questions which were not well answered were removed from the questionnaire, provided that these were not essential for yielding indispensable information and provided that the removal would not affect the quality of the data.

The questions which were removed or changed included:

- The question relating to the subject's position in the family (i.e. first-born, second-born, etc) was removed because it was difficult for the subjects to

understand and the data that it would yield would not form an indispensable part of the study.

- The question relating to which ethnic group the subjects belong to was also omitted as this information was recorded by the investigator upon weighing the subjects.
- The question “Do you go to school in the same area as you stay?” was omitted since it proved to be confusing for the subjects and the information it would yield was unlikely to prove indispensable.
- Since some of the children confused the word “diet” with “died”, “diet” was replaced throughout with “lose weight” or “weight loss” depending on the context.
- The questions “Have you ever thought you are thin?” and “Have you ever thought you are fat?” were omitted because of being superfluous. These issues were covered in a different way in other parts of the questionnaire. Inclusion would have added unnecessary length to the questionnaire. Removal is thus likely to have contributed to a reduction in respondent fatigue and resultant bias in responses.
- The question “I am aware of the energy (calorie) content in foods that I eat” was removed since it was badly answered and difficult for the children to conceptualise.
- The question “I make myself vomit after I have eaten” was removed since children misinterpreted this. Rather than seeing it as a weight loss method, they tended to perceive it as meaning having to vomit after eating because of feeling genuinely nauseous or ill.
- The question “I feel very guilty after eating” was removed because of the potential for it to be misinterpreted by the children in terms of feelings of relating to food security (i.e. eating with the knowledge that friends, family or others may not have food to eat).

The nature and extent of a total of 15 other questions were also changed to improve validity and these changes are detailed in Appendix 2.

2.7 ANALYSIS OF DATA

2.7.1 Data capturing and collation

All potential responses to the questions in the questionnaire were scored numerically for ease of data collection. All data (both from questionnaire and anthropometric) was suitably coded and entered by the investigator into a Microsoft Excel spreadsheet, from which further analysis could take place. Following this, the investigator checked the spreadsheet data against the questionnaire data for quality control.

2.7.2 Statistical analysis of data

This analysis involved looking for statistically significant relationships between the subjects' BMI and body image perception satisfaction. The data was also analysed for statistically significant relationships between the aforementioned factors that may contribute to poor body image perception, as well as the relation of these factors to the subjects' BDS.

Statistical analysis of the data was performed by the investigator with the aid of the statistician. This involved using the appropriate type of statistical test for the type of data collected, including:

- Analysis of variance (ANOVA) tests when a normally-distributed continuous variable was compared to a nominal input variable.
- The Mann-Whitney test or Kruskal-Wallis test were used when a non-normally distributed continuous variable was compared to a nominal variable in the case of non-parametrically ordered data. Logistic regression methods were used when nominal variables were needed to be compared to continuous variables.
- Appropriate non-parametric ANOVA methods were used to compare ordinal variables with nominal input variables.
- Maximum-likelihood (ML) chi-square test or Pearson's chi-square test and appropriate contingency table analyses were used when nominal variables were compared to other nominal input variables.
- Regression and correlation analysis was used when a continuous variable was compared to another continuous variable, with Pearson correlation analysis being used for

normally distributed data and Spearman rank correlation analysis being used for non-normally distributed data.

- The level of significance used was $p < 0.05$ to give a confidence level of 95%

Statistica 8⁸⁸ was used for all data analysis.

2.8 ETHICS AND LEGAL ASPECTS

2.8.1 Ethics review Committee

The study was submitted for approval to the Committee of Human Research in the Faculty of Health Sciences of Stellenbosch University and consent granted. Project number: N07/11/255.

2.8.2 Informed consent

Although the Department of Education was approached several times to obtain their consent, no response – neither positive nor negative – was obtained. However, prior to commencement of the study, consent was obtained from each of the selected schools which participated in the study.

Every potential subject and their parent(s) received an information pamphlet (Appendix 3), which provided them with more details regarding the study.

In order for the subject to be eligible to take part in the study, the subject's parent (or, in the absence of a parent, the subject's guardian) had to understand and sign the informed consent form (Appendix 4). Furthermore, the subject needed to understand and sign the assent form (Appendix 5). The standard consent and assent forms used by the Faculty of Health Sciences of Stellenbosch University were adapted and used in this study. Assent was needed from the subjects themselves, because they were old enough to be able to have autonomy regarding their decision as to whether they wanted to participate in the study. Both the consent and assent forms were attached to the information pamphlet and were sent home with the subjects for the parents to read at their leisure. The consent form, assent form and information pamphlet were all in English which is, as mentioned earlier, due to each of the schools approached feeling that English is well-understood and spoken by the subjects as well as by

their parents. The signed consent and assent forms were then sent back to school with the subject and collected by the subjects' class teacher. These forms were then collected by the investigator on the day of the study and were checked to ensure that those subjects who participated in the study were only those who had had both forms signed.

2.8.3 Subject confidentiality

Privacy and confidentiality of the subjects was maintained by not disclosing the information provided. The respondent was kept anonymous by the investigator not requesting identifying information (e.g. name, telephone number, address) in the questionnaire. Each subject's questionnaire was coded with a unique number to identify it, without the need to rely on personal details.

The information obtained from the subjects by the investigator was only used for this specific study and will not be shared or utilized for any other purposes or studies.

CHAPTER 3: RESULTS

3.1 INCLUSION OF SCHOOLS AND SUBJECTS

Of the 66 primary schools in Region E of Johannesburg, 22 schools (33.33%) were private schools and the remainder was government schools. Thirteen (19.70%) of the total 66 schools were not eligible to participate as they were special needs schools or all-boys schools. A total of 53 schools were thus eligible to participate in the study.

Of these, 30 (56.60%) were selected through three rounds of systematic random sampling. Of the 30 schools, 8 (26.67%) actually participated. The investigator attempted to include more schools to increase the sample size but after three rounds of systematic random sampling a decision was taken to move forward with 8 schools. Various reasons for non-participation were given by the 22 (73.33%) schools not willing to participate. Figure 3.1 shows a breakdown for all listed schools (i.e. 66) as regards whether or not they participated and, if not, what the reasons were. Of the final 8 schools selected, 2 schools (25.00%) were private schools and 6 schools (75.00%) were government schools.

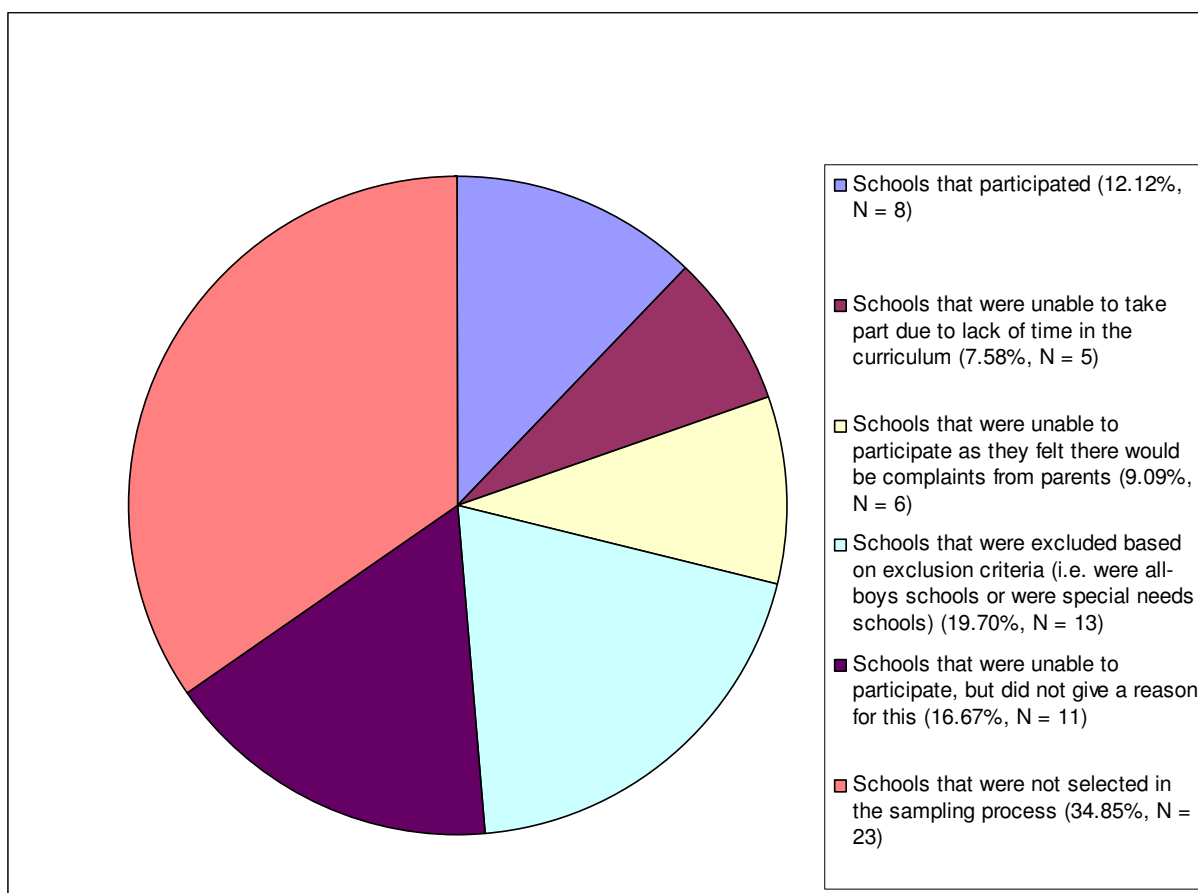


Figure 3.1: Involvement of various schools in Northeastern Johannesburg in the study

The number of subjects that would have allowed for an error of 5% within a confidence level of 95% is 385 subjects and was thus the number of subjects the investigator originally intended to use. It was estimated that 10 schools would be likely to yield at least that number of subjects. However, the final sample size was 204 subjects due to the limited number of schools being prepared to take part. As a result, at the 95% confidence level with the sample of 204 respondents, the expected margin of error was 6.87%.

Two factors led to the reduction in sample size. Firstly, not all schools chosen through the first round of random sampling ($N = 10$) consented to participate in the study and this necessitated a further two rounds. This procedure yielded a total of 8 schools prepared to participate.

Secondly, within the schools that took part in the study, not all the learners eligible to participate actually participated (Figure 3.2). There was a poor response from the parents of private school children. Many of the parents who did not wish for their children to take part were concerned that taking part in the study could detrimentally affect their child's body image perception. The investigator also received some concerns from parents who said that their children were happy to take part but that the children felt uncomfortable having their weight measured. It is not possible to ascertain whether this was the concern of the child, or whether it was the parents' own concerns that were affecting the child's decision. These children could thus not be included since weight data was essential to the study.

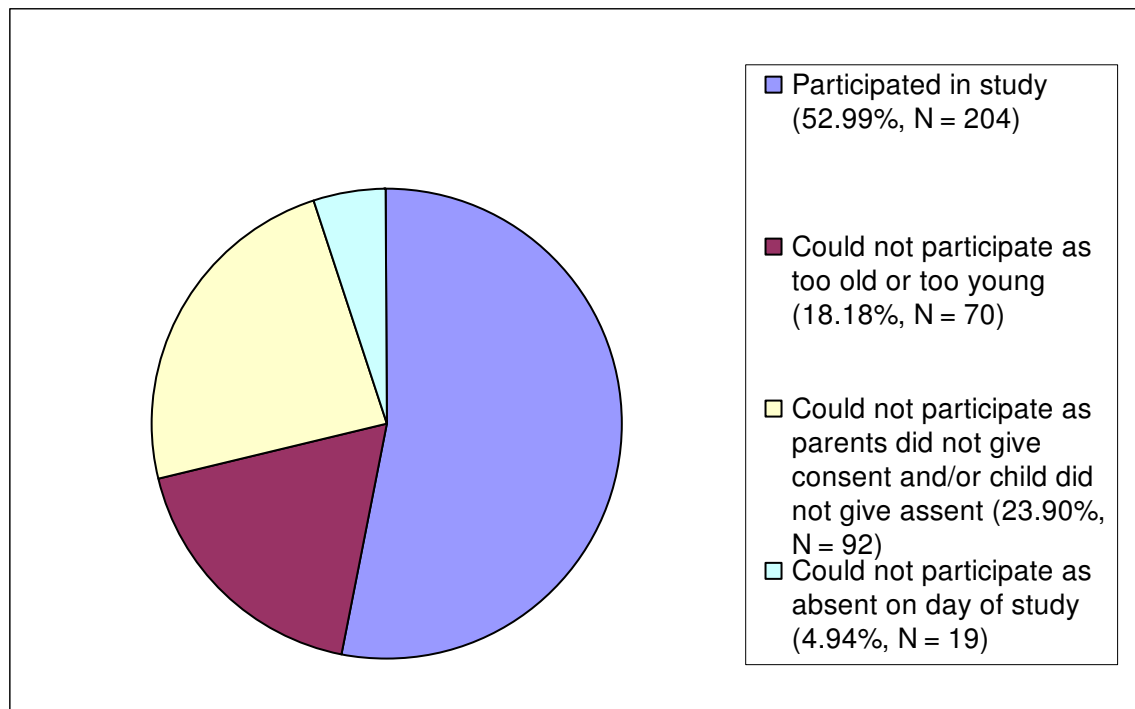


Figure 3.2 Participation and non-participation by potential subjects in the study

Of the 204 subjects that took part in the study, 166 (81.37%) were Black, 31 (15.20%) were White, 4 (1.96%) were Indian and 3 (1.47%) were Coloured. This is very similar to the demographic characteristics for this area of Johannesburg (i.e. Region E – Figure 2.1) in which 87% of the population of Region E are Black, 11% are White, 1% Indian and 1% Coloured.⁷⁵ What will have been observed in the results of this study is that in most cases, the results for the group overall and the Black subjects are similar. This is understandable considering that the majority of the sample was comprised of Black subjects. In addition, because there was a very small number in the “other” sector, they were not studied as a separate group. The results would not have been statistically significant. However, these subjects formed part of the total sample when the overall group statistical calculations were performed.

3.2 DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION

Demographically (Table 3.1), there was a statistically significant difference between the ethnic groups with respect to the primary caregiver being the father ($\chi^2 = 3.70$, $p = 0.05$) or “other” ($\chi^2 = 16.85$, $p < 0.01$). Significantly more White than Black subjects were looked after by their father and by a person “other” than those listed. There was also a higher percentage

of White subjects that were looked after by their mother than Black subjects. No statistically significant difference was found between the ethnic groups with respect to the primary caregiver being both parents ($\chi^2 = 0.45$, $p = 0.50$), siblings ($\chi^2 = 0.09$, $p = 0.76$), a grandmother ($\chi^2 = 0.03$, $p = 0.87$), or a grandfather ($\chi^2 = 0.25$, $p = 0.62$).

As could have been anticipated, there was also a statistically significant difference between the ethnic groups with respect to home language ($\chi^2 = 100.79$, $p < 0.01$), with significantly more Black subjects speaking Sotho or Zulu at home and significantly more White subjects speaking English or Afrikaans at home.

Table 3.1: Demographic data of the subjects in relation to the subjects' age, primary caregiver and home language

Ethnicity (N)	Mean age [Standard Deviation (SD)]	Primary caregiver %*, (N)	Home language %*, (N)
Group overall (204) (Includes: Black, White and Other Ethnic groups)	8.9 years (0.48 years)	Mother: 36.27 (74) Father: 9.80 (20) Both parents: 24.51 (50) Sibling: 17.16 (35) Grandmother: 23.53 (48) Grandfather: 4.41 (9) Other: 14.71 (30)	English: 27.94 (57) Afrikaans: 3.92 (8) Sotho: 24.51 (50) Zulu: 35.78 (73) Other: 23.04 (47)
Black (166)	8.9 years (0.51 years)	Mother: 33.73 (56) Father: 7.23 (12) Both parents: 22.89 (38) Sibling: 18.07 (30) Grandmother: 23.49 (39) Grandfather: 4.22 (7) Other: 9.64 (16)	English: 12.05 (20) Afrikaans: 2.41 (4) Sotho: 30.12 (50) Zulu: 43.98 (73) Other: 24.70 (41)
White (31)	8.9 years (0.32 years)	Mother: 51.61 (16) Father: 19.35 (6) Both parents: 29.03 (9) Sibling: 16.13 (5) Grandmother: 22.58 (7) Grandfather: 6.45 (2) Other: 41.94 (13)	English: 96.77 (30) Afrikaans: 9.68 (3) Sotho: <i>N</i> = 0.00 (0) Zulu: <i>N</i> = 0.00 (0) Other: <i>N</i> = 16.13 (5)

*For some subjects more than one answer was relevant and hence total % exceeds 100%

There was a statistically significant difference between the ethnic groups with respect to the primary caregiver being the father ($\chi^2 = 3.70$, $p = 0.05$) or "other" ($\chi^2 = 16.85$, $p < 0.01$), as well as with respect to home language ($\chi^2 = 100.79$, $p < 0.01$). No statistically significant difference was found between the ethnic groups with respect to the primary caregiver being both parents ($\chi^2 = 0.45$, $p = 0.50$), siblings ($\chi^2 = 0.09$, $p = 0.76$), a grandmother ($\chi^2 = 0.03$, $p = 0.87$), a grandfather ($\chi^2 = 0.25$, $p = 0.62$).

3.3 ANTHROPOMETRIC STATUS OF THE SUBJECTS

The majority of the subjects were at a healthy weight in the group overall (60.00%, $N = 120$) and when looked at separately amongst Black subjects (59.26%, $N = 96$) and White subjects (64.52%, $N = 20$). There was no statistically significant difference between the ethnic groups with respect to BMI ($\chi^2 = 0.35$, $p = 0.84$) and the average BMI for the group as a whole was

within a normal range i.e. between the 15th and 85th percentile for BMI-for-age (Figure 3.3; Table 3.2). What should be noted is that although, overall, there was a significant tendency towards a healthy weight and normal BMI, a relatively high incidence of overweight (19.61%) was found in these children. This means that virtually 1 in 5 of girls in this age group was overweight. The proportion overweight was similar in all ethnic groups, while the underweight proportion was very low in all ethnic groups (1% or less).

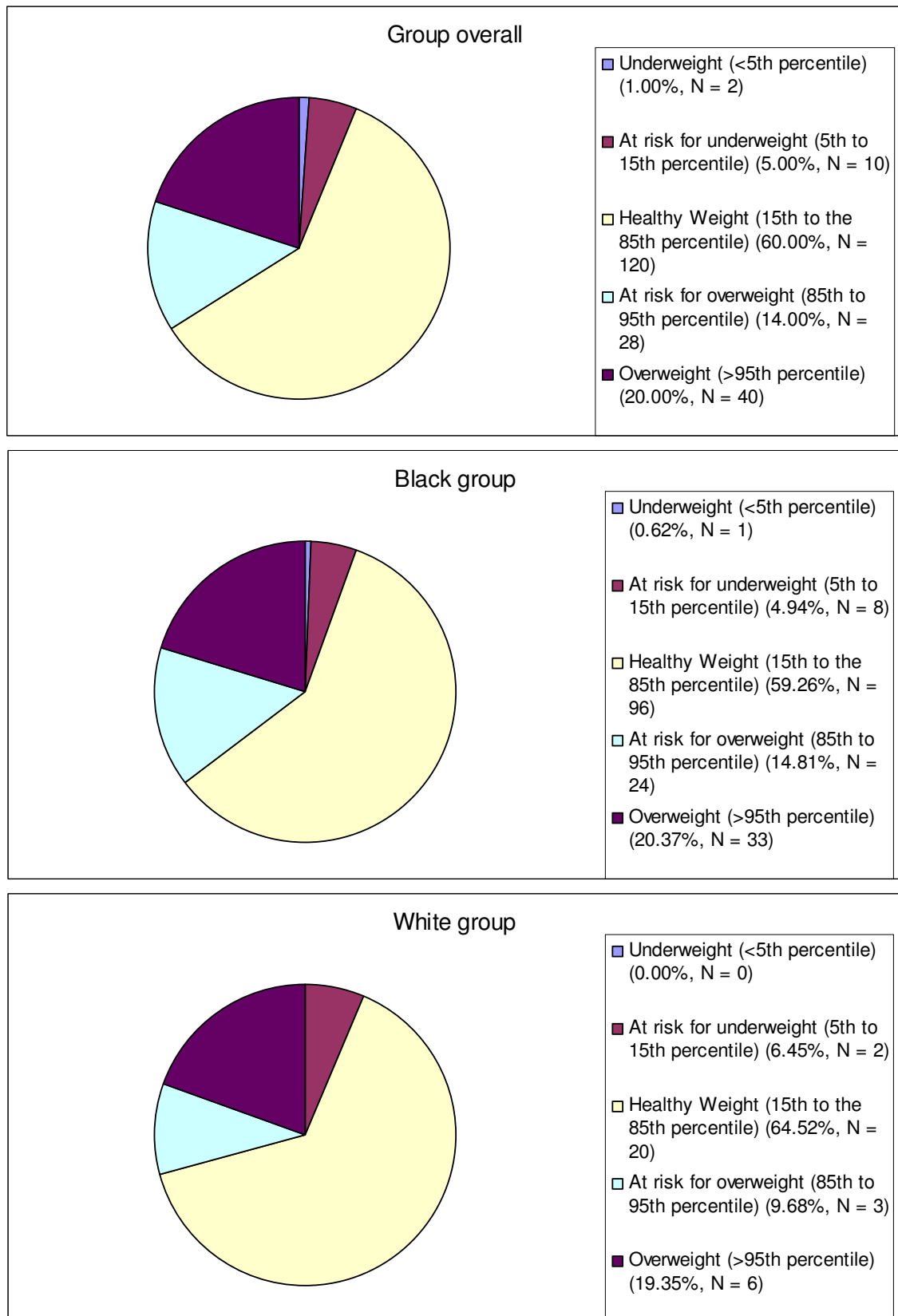


Figure 3.3: Classification by Body Mass Index (BMI) status of all the subjects and by ethnic group

There was no statistically significant difference between the ethnic groups with respect to BMI ($\chi^2 = 0.35$, $p = 0.84$)

Table 3.2: Mean Body Mass Index (BMI)-for-age by ethnicity

Ethnicity (N)	Mean BMI-for-age (kg/m²)⁸² (SD)
All subjects (N = 204)	17.74 (3.19) – considered to be at a healthy weight
Black (N = 166)	17.79 (3.20) – considered to be at a healthy weight
White (N = 31)	17.81 (3.28) – considered to be at a healthy weight

There was no statistically significant difference between ethnic groups with respect to BMI ($\chi^2 = 0.35$, $p = 0.84$)

3.4 BODY IMAGE PERCEPTION AND BODY SHAPE SATISFACTION

3.4.1 Current Weight Satisfaction

The subjects were asked how happy they were with their current weight (Figure 3.4). In the group overall, the majority of subjects were happy with their weight, with most of these being “very happy” (69.61%, $N = 142$) and a further sector being “quite happy” (20.59%, $N = 42$). The remainder, less than 10%, were unhappy i.e. “quite unhappy” (3.43%, $N = 7$) and “very unhappy” (6.37%, $N = 13$).

There was a statistically significant difference between the ethnic groups with respect to their current weight satisfaction ($\chi^2 = 12.52$, $p = 0.01$), with Blacks overall reflecting a far greater degree of satisfaction i.e. a higher proportion of Blacks were very/quite happy with their weight than was the case amongst their White counterparts and a far higher proportion focused on “very happy” than was the case amongst Whites. More specifically, in the Black ethnic group, most of the subjects (92.17%, $N = 153$) were happy with their weight with the majority of these (74.10%, $N = 123$) choosing “very happy”. In the White ethnic group, 77.42% ($N = 24$) were happy with their weight with the majority (45.16%, $N = 14$) choosing “very happy”.

There was a statistically significant relationship found in the group overall ($p = 0.02$ using the Kruskal-Wallis test) between the BDS and the subjects’ weight satisfaction. More specifically, those who were “very happy” with their weight had an overall BDS close to zero (mean BDS: -0.17), meaning that their ideal silhouette was not significantly different from how they actually saw themselves; while those subjects who were “very unhappy” with their

weight had a negative BDS (mean BDS: -0.92), meaning that they wanted to be approximately one silhouette thinner than how they saw themselves.

The Kruskal-Wallis test showed no statistically significant relationship between the subjects' BDS and their current weight satisfaction in the Black subjects ($p = 0.12$), nor in the White subjects ($p = 0.09$).

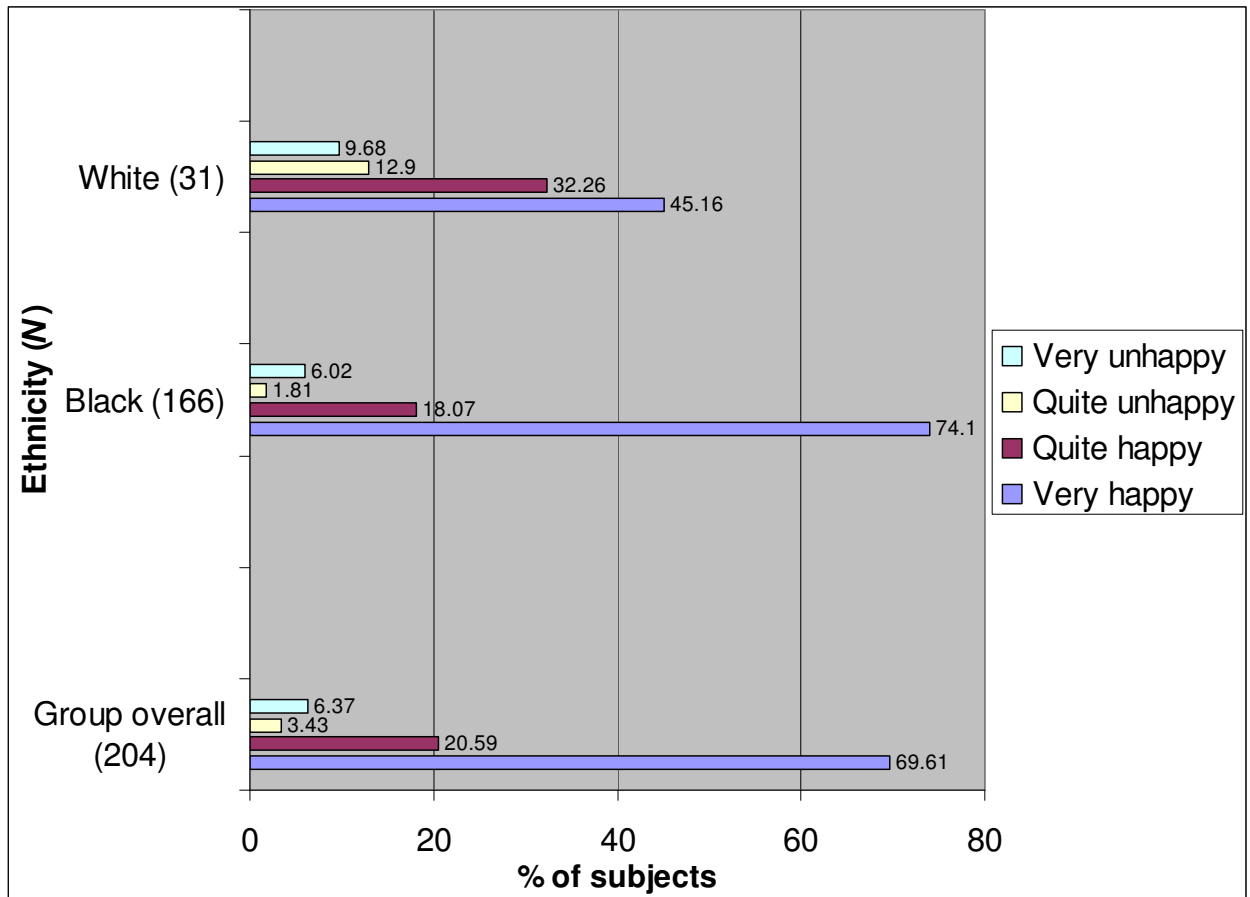


Figure 3.4: Distribution of Body Dissatisfaction Score (BDS) and weight satisfaction in overall group

There was a statistically significant difference between the ethnic groups with respect to their current weight satisfaction ($\chi^2 = 12.52$, $p = 0.01$).

3.4.2 BDS in relation to anthropometric status

In the group overall, both subjects that were classified as underweight ($N = 2$) wanted to be larger and thus had a positive BDS (Table 3.3). Of the 10 (4.90%) subjects classified as being at risk of underweight, just over half (60.00%, $N = 6$) wanted to be larger and therefore had a positive BDS, while virtually all of the remainder of those at risk of underweight were

satisfied with their weight (30.00%, $N = 3$) and thus had a BDS of zero. Of those subjects classified as being at a healthy weight ($N = 120$), more wanted to be thinner (42.50%, $N = 51$) than larger (33.3%, $N = 40$) and only 24.17% ($N = 29$) were satisfied with their weight. Amongst those classified as at risk of overweight ($N = 28$) and more so amongst those classified as overweight ($N = 40$), the desire to be thinner was distinctly far greater than the desire to be larger i.e. Of those at risk of overweight, 50.00% ($N = 14$) wanted to be thinner and 17.86% ($N = 5$) larger; of those classified as overweight, 85.00% ($N = 34$) wanted to be thinner and 10.00% ($N = 4$) wanted to be larger.

Table 3.3: Relation of Body Dissatisfaction Score (BDS) of subjects in the group overall to their anthropometric status in the group overall

BMI category ($N = 200$)*	BDS [%, (N)]		
	- BDS (want to be thinner) ($N = 100$)	BDS = 0 (satisfied with weight) ($N = 43$)	+ BDS (want to be larger) ($N = 57$)
1: Underweight (2)	0.00 (0)	0.00 (0)	100.00 (2)
2: At risk of underweight (10)	10.00 (1)	30.00 (3)	60.00 (6)
3: Healthy Weight (120)	42.50 (51)	24.17 (29)	33.33 (40)
4: At risk of overweight (28)	50.00 (14)	32.14 (9)	17.86 (5)
5: Overweight (40)	85.00 (34)	5.00 (2)	10.00 (4)

*4 subjects did not answer this question

The above deals with the relationship between BDS (based on subjects' responses using the Silhouette Perception Scale) and BMI (based on the investigator's anthropometric measurements). An additional question (Question 2.6) required the subjects to state how they classified their own weight, i.e. "thin," "fat," or "just right" (Table 3.4). There was no statistically significant difference between the ethnic groups with respect to the subjects classification of their weight ($\chi^2 = 1.97$, $p = 0.37$). In the group overall, there was a statistically significant relationship found between the BDS and the subjects' classification of their weight ($p < 0.01$ using the Kruskal-Wallis test). This means that those subjects that felt they were thin, had a positive BDS and thus wanted to gain weight; those subjects that felt they were fat, had a negative BDS and thus wanted to lose weight; while those subjects that thought they were "just right" had a BDS close to zero and therefore were happy with their weight – they neither wanted to gain nor lose weight. Of the overall group, the majority of the subjects (74.88%, $N = 152$) thought that their weight was "just right".

In the Black subjects, there was also a statistically significant relationship between the subjects' BDS and their classification of their own weight ($p < 0.01$ using the Kruskal-Wallis test) (Table 3.4). Of the Black subjects, the majority (76.97%, $N = 127$) thought that they were "just right". The mean BDS for those who thought that their weight was "just right" was -0.24 and thus close to zero, whereas those subjects who felt they were "thin" had a more positive BDS and thus wanted to gain weight and those who felt they were "fat" had a more negative BDS and thus wanted to lose weight.

However, in the White subjects, there was no statistically significant relationship found between the subjects' BDS and their classification of their weight ($p = 0.16$) (Table 3.4). In the case of the White subjects, the majority (67.74%, $N = 21$) thought they were "just right", but those thinking that they were "just right" exhibited a similar mean BDS (-0.81) to those who thought that they were "fat" (-0.80).

Table 3.4: Characteristics of the subjects' classification of their own weight and their Body Dissatisfaction Score (BDS)

Ethnicity (N)	Weight classification [%, (N)]			p-value
	Thin	Just right	Fat	
Group overall (203*)	16.26 (33) Mean BDS: + 0.70 (1.99)	74.88 (152) Mean BDS: - 0.33 (1.50)	8.87 (18) Mean BDS: - 1.61 (1.46)	<0.01
Black (165*)	15.15 (25) Mean BDS: + 0.84 (2.21)	76.97 (127) Mean BDS: - 0.24 (1.54)	7.88 (13) Mean BDS: - 1.92 (1.38)	<0.01
White (31)	16.13 (5) Mean BDS: + 0.40 (1.14)	67.74 (21) Mean BDS: - 0.81 (1.21)	16.13 (5) Mean BDS: - 0.80 (1.48)	0.16

Significance level: $p < 0.05$

*1 subject did not answer this question

p-value refers to the relationship between the subjects' BDS and their classification of their weight

There was no statistically significant difference between the ethnic groups with respect to the subjects classification of their weight ($\chi^2 = 1.97$, $p = 0.37$).

3.4.3 Subjects' concerns about their weight

In Question 2.7, the subjects were asked whether they worried about being thin (Table 3.5). There was no statistically significant difference between the ethnic groups with respect to their worries about being thin ($\chi^2 = 1.32$, $p = 0.25$). Using the Mann-Whitney test no statistically significant relationship was found between the subjects' BDS and worrying about being thin in the group overall ($p = 0.12$) in the Black ethnic group ($p = 0.09$) nor in the White ethnic group ($p = 0.40$). Subjects veered more towards saying that they do not worry about being thin, but saying this was more characteristic of the White group (67.74%, $N = 21$) than of the Black group (56.79%, $N = 92$) or the group as a whole (58.00%, $N = 116$).

Question 2.8 asked the subjects whether they worried about being fat (Table 3.5). There was a statistically significant difference between the ethnic groups with respect to their worries about being fat ($\chi^2 = 8.53$, $p < 0.01$), with significantly more White subjects worrying about this than was the case amongst the Black subjects. The Mann-Whitney test showed no significant relationship in either the group overall ($p = 0.40$) or in the Black sector ($p = 0.68$), between those girls that thought they were fat and their BDS. However, in the White ethnic group, there was a statistically significant relationship ($p = 0.04$ using the Mann-Whitney test) between those subjects that worried about being fat and their BDS. White subjects that worried about being fat were more likely to have a negative BDS and thus were more likely to want to lose weight, than those that did not worry about being fat. In the group overall, over half of the subjects (51.49%, $N = 104$) answered that they did not worry about being fat and amongst the Black subjects this proportion was even higher (57.31%, $N = 94$). Amongst the White subjects, however, the majority of (70.97%, $N = 22$) indicated that they worried about being fat.

Table 3.5: Characteristics of the subject's concerns about their own weight in relation to their Body Dissatisfaction Score (BDS)

Ethnicity (N)	Worry about being thin [% , (N)]		p-value	Worry about being fat [% , (N)]		p-value
	Mean BDS (SD)			Mean BDS (SD)		
	Yes	No		Yes	No	
Group overall	N = 200*		0.12	N = 202**		0.40
	42.00 (84) Mean BDS: - 0.56 (1.51)	58.00 (116) Mean BDS: - 0.10 (1.81)		48.51 (98) Mean BDS: - 0.35 (1.57)	51.49 (104) Mean BDS: - 0.26 (1.80)	
Black	N = 162*		0.20	N = 164**		1.00
	43.21 (70) Mean BDS: - 0.50 (1.58)	56.79 (92) Mean BDS: - 0.02 (1.92)		42.68 (70) Mean BDS: - 0.17 (1.65)	57.31 (94) Mean BDS: - 0.29 (1.87)	
White	N = 31		0.39	N = 31		0.04
	32.26 (10) Mean BDS: - 0.90 (1.10)	67.74 (21) Mean BDS: - 0.48 (1.36)		70.97 (22) Mean BDS: - 0.91 (1.31)	29.03 (9) Mean BDS: + 0.11 (0.93)	

Significance level: $p < 0.05$

*4 subjects did not answer this question

**2 subjects did not answer this question

p-value refers to relationship between BDS and whether subjects worry about being thin (1st column), and whether they worry about being fat (2nd column) respectively.

There was no statistically significant difference between the ethnic groups with respect to their worries about being thin ($\chi^2 = 1.32$, $p = 0.25$).

There was a statistically significant difference between the ethnic groups with respect to their worries about being fat ($\chi^2 = 8.53$, $p < 0.01$). Significantly more White subjects worried about being fat, than Black subjects.

3.4.4 General perception of body size and shape

Using the same Silhouette Perception Scale as for the questions enabling calculation of BDS, the subjects (in Question 2.1) had to select the silhouette they considered to be thin, normal weight and fat respectively (Table 3.6).

3.4.4.1 Silhouette considered to be 'thin'

There was no statistically significant relationship between the subjects' BDS and the silhouette they considered to be thin (Table 3.6) i.e. in the group overall, amongst the Black

subjects and amongst the White subjects ($p = 0.70, 0.15, 0.73$ respectively using the Kruskal-Wallis test).

Although there was a statistically significant difference ($\chi^2 = 10.36, p = 0.04$) between the ethnic groups with respect to which silhouette they considered to be thin, a large majority of the total sample (91.54%, $N = 184$), as well as of the Black (93.87%, $N = 153$) and White (80.65%, $N = 25$) subjects chose the thinnest silhouette, *Silhouette A* (BMI category 1 – underweight) as their answer (Table 3.6). A small number of subjects in all groups chose a silhouette type other than *Silhouette A* (BMI category 1 – underweight) as their answer for this question [17 (8.46%) of the group overall, 10 (6.13%) of the Black subjects and 6 (19.35%) of the White subjects]. *Silhouettes B* (BMI category 2 – at risk of underweight) to *E* (BMI category 3 – at a healthy weight) were all chosen by at least 1 subject, but no subjects considered *Silhouettes F* (BMI category 4 – at risk of overweight), *G* (BMI category 4 – at risk of overweight) or *H* (BMI category 5 – overweight) to be “thin.”

3.4.4.2 Silhouette considered to be “normal” weight

Also in question 2.1, the subjects had to choose the silhouette they thought represented a “normal weight” (Table 3.6). There was no statistically significant relationship between the subjects’ BDS and the silhouette the subjects considered to be normal weight in the group overall, the Black subjects and the White subjects ($p = 0.20, 0.28, 0.11$ respectively using the Kruskal-Wallis test). There was, however, a statistically significant difference between the ethnic groups with respect to which silhouette they thought was normal ($\chi^2 = 21.01, p < 0.01$). *Silhouette E* was chosen far more often as representing normal weight than were other silhouettes, in the total sample (55.72%, $N = 112$) and amongst the Black children (62.58%, $N = 102$) However, amongst the White children the focus was more on *Silhouette D* – a thinner silhouette than *E* – as being normal weight, with *D* being chosen by 38.71% ($N = 12$) and *E* being chosen by 29.03% ($N = 9$),

3.4.4.3 Silhouette considered to be “fat”

Question 2.1 also required the subjects to choose the silhouette they considered to be “fat” (Table 3.6). There was no statistically significant difference between the ethnic groups with respect to which silhouette they thought was fat ($\chi^2 = 9.97, p = 0.07$). The majority of the

group overall (93.94%, $N = 186$), of the Black subjects (95.63%, $N = 153$) and of the White subjects ($N = 26$, 83.87%), chose the largest silhouette, *Silhouette H* (BMI category 5 – overweight) as being “fat”. There was a statistically significant relationship (using the Mann-Whitney test) between the subjects’ BDS and the silhouette they considered to be fat in the group overall ($p = 0.01$) as well as in the Black ethnic group ($p = 0.01$), but not in the White group ($p = 0.21$). Therefore in the case of the group overall and the Black ethnic group, it can be seen in Table 3.6 that those subjects with a more positive BDS chose *Silhouette G* as being “fat,” whereas those that chose *Silhouette H* had a more negative BDS. Therefore it is possible that in the group overall and in the Black ethnic group that subjects that had a more positive BDS and thus wanted to be larger saw the word “fat” in a more positive light and thus chose *Silhouette G* as being a desirable level of “fatness.” Whereas those subjects in the group overall and the Black ethnic group with a BDS that was negative but close to zero attached less emotion to the word “fat” and saw it more in the literal context, thus choosing the silhouette (i.e. *Silhouette H*), which was factually correct to be the fattest, as being the silhouette that could be considered fat.

Table 3.6: Silhouette subjects considered to be “thin,” “normal weight” and “fat” and their Body Dissatisfaction Score (BDS)

Ethnicity (N)	p- value	Silhouette chosen [% , (N)]							
		Mean BDS (SD)							
		Underweight	At risk of underweight		Healthy weight		At risk of overweight		Overweight
		A	B	C	D	E	F	G	H
		Silhouette considered to be “thin”							
Group overall (201*)	0.70	91.54 (184) Mean BDS: - 0.29 (1.68)	1.00 (2) Mean BDS: - 0.50 (2.12)	2.00 (4) Mean BDS: - 0.25 (0.96)	4.00 (8) Mean BDS: 0.00 (2.51)	1.50 (3) Mean BDS: - 1.67 (0.58)	0.00 (0)	0.00 (0)	0.00 (0)
Black (163*)	0.15	93.87 (153) Mean BDS: - 0.25 (1.75)	0.61 (1)	0.61 (1)	3.07 (5) Mean BDS: + 0.80 (2.95)	1.84 (3) Mean BDS: - 1.67 (0.58)	0.00 (0)	0.00 (0)	0.00 (0)
White (N = 31)	0.73	80.65 (25) Mean BDS: - 0.56 (0.26)	3.23 (1)	9.68 (3) Mean BDS: - 0.33 (0.76)	6.45 (2) Mean BDS: -1.00 (0.00)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
		Silhouette considered to be “normal weight”							
Group overall (201*)	0.20	1.99 (4) Mean BDS: - 1.50 (0.83)	3.98 (8) Mean BDS: - 0.38 (0.59)	7.46 (15) Mean BDS: - 0.80 (0.43)	19.40 (39) Mean BDS: - 0.67 (0.27)	55.72 (112) Mean BDS: - 0.15 (0.16)	9.45 (19) Mean BDS: + 0.26 (0.38)	1.99 (4) Mean BDS: - 0.75 (0.83)	0.00 (0)
Black (163*)	0.28	1.23 (2) Mean BDS: - 2.00 (0.00)	4.29 (7) Mean BDS: - 0.43 (1.40)	5.52 (9) Mean BDS: - 0.89 (1.27)	13.50 (22) Mean BDS: - 0.45 (1.53)	62.58 (102) Mean BDS: - 0.16 (1.81)	10.43 (17) Mean BDS: + 0.24 (2.22)	2.45 (4) Mean BDS: - 0.75 (0.96)	0.00 (0)
White (31)	0.11	3.23 (1)	3.23 (1)	19.35 (6) Mean BDS: - 0.67 (1.37)	38.71 (12) Mean BDS: - 1.33 (1.07)	29.03 (9) Mean BDS: 0.00 (1.12)	6.45 (2) Mean BDS: + 0.50 (2.12)	0.00 (0)	0.00 (0)
		Silhouette considered to be “fat”							
Group overall (198**)	0.01	0.00 (0)	0.00 (0)	0.51 (1)	0.51 (1)	0.51 (1)	0.51 (1)	4.04 (8) Mean BDS: + 1.25 (1.83)	93.93 (186) Mean BDS: - 0.38 (1.65)
Black (160**)	0.01	0.00 (0)	0.00 (0)	0.63 (1)	0.63 (1)	0.63 (1)	0.00 (0)	2.504 Mean BDS: + 2.25 (1.89)	95.63 (153) Mean BDS: - 0.31 (1.72)
White (31)	0.21	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	3.23 (1)	12.904 Mean BDS: + 0.25 (0.64)	83.87 (26) Mean BDS: - 0.73 (1.28)

Significance level: $p < 0.05$

*3 subjects did not answer this question

**6 subjects did not answer this question

p-value refers to the relationship between the subjects' BDS and which silhouette they felt was thin, normal weight and fat, respectively.

There was a statistically significant difference between the ethnic groups with respect to which silhouette they thought was thin ($\chi^2 = 10.36$, $p = 0.04$) and normal ($\chi^2 = 21.01$, $p < 0.01$).

3.4.4.4 Association of various attributes in relation to weight and body size

Question 2.2 required the subjects to choose, for each of a list of attributes, the silhouette they felt most personified that attribute (Table 3.7).

Firstly they had to choose the silhouette which they thought *looked the best*. There was a statistically significant difference between ethnic groups with respect to choice of silhouette for this attribute ($\chi^2 = 25.14$, $p < 0.01$). Although a large proportion of Black subjects (33.33%, $N = 55$) chose *Silhouette D* as looking the best, this was closely followed by 30.91% ($N = 51$) that chose *Silhouette E* as looking the best. However in the case of the White subjects, *Silhouette D* was chosen the most often as looking the best (35.48%, $N = 11$), followed by *Silhouette A* (25.81%, $N = 8$). Therefore the silhouette which the Black subjects thought looked the best was significantly larger than the one which the White subjects chose. Using the Kruskal-Wallis test, a statistically significant relationship was found in the group overall ($p < 0.01$) and in the Black subjects ($p = 0.04$), between the subjects' BDS and their choice of the silhouette they thought looked the best. This can be interpreted to mean that the subjects with a negative BDS thought that the smaller silhouettes looked the best, whereas the subjects with a positive BDS thought that the more overweight silhouettes looked the best.

With regard to the silhouette that the subjects thought would be the *clumsiest*, all three groups chose *Silhouette H*, the largest silhouette, for this answer. However, using the Kruskal-Wallis test there was no statistically significant relationship between BDS and which silhouette the subjects chose for this answer in all three groups. There was also no statistically significant difference between the ethnic groups with respect to their choice of silhouette for this answer ($\chi^2 = 10.05$, $p = 0.19$).

With regard to the silhouette they felt people would be *most proud of*, there was a statistically significant difference between ethnic groups ($\chi^2 = 30.91$, $p < 0.01$). The silhouette which the Black subjects chose more often as the one people would be proud of (*Silhouette E*) was significantly larger than the silhouette that the White subjects chose more often for this factor (*Silhouette C*). There was also a statistically significant difference between ethnic groups with respect to the silhouette they felt people would be *least proud of* ($\chi^2 = 18.78$, $p = 0.01$). Although both the Black and White subjects chose *Silhouette H* as being the silhouette people would be least proud of, more Black subjects compared to White subjects thought that people

would be least proud of a thinner silhouette. The Kruskal-Wallis test showed no statistically significant relationship in the group overall ($p = 0.26$), in the Black subjects ($p = 0.08$) or the White subjects ($p = 0.48$) between the subjects' BDS and the silhouette they felt people would be least proud of. However, the Kruskal-Wallis test did show a statistically significant relationship in the group overall ($p = 0.01$) and in the Black subjects ($p = 0.04$) between the subjects' BDS and the silhouette subjects felt that people would be most proud of. This implies that, amongst Black children and in the group overall, those subjects with a more negative BDS thought that people would be more proud of a girl with a thinner silhouette, whereas those with a more positive BDS thought that people would be more proud of a girl with a more overweight silhouette. No statistically significant relationship was found in this regard amongst the White subjects ($p = 0.08$ using the Kruskal-Wallis test).

There was a statistically significant difference between ethnic groups with respect to which silhouette they felt would be the *strongest* ($\chi^2 = 30.14$, $p < 0.01$). The silhouette which the Black subjects thought would be the strongest (i.e. *Silhouette H*) was significantly larger than the silhouettes which the White subjects chose for this attribute (i.e. *Silhouettes B* or *E*). As regards which silhouette they thought would be *weakest*, there was no statistically significant difference between ethnic groups ($\chi^2 = 13.61$, $p = 0.06$). The Kruskal-Wallis test showed no statistically significant relationship between the subjects' BDS and which silhouette they felt would be the strongest, in the group overall ($p = 0.21$), the Black subjects ($p = 0.15$) nor the White subjects ($p = 0.28$). Also, the Kruskal-Wallis test showed no statistically significant relationship between the subjects' BDS and which silhouette they thought would be the weakest, in the group overall ($p = 0.33$), amongst the Black subjects ($p = 0.53$) or amongst the White subjects ($p = 0.81$).

There was no statistically significant difference between ethnic groups with respect to which silhouette they thought would be *unhappiest* ($\chi^2 = 12.55$, $p = 0.08$). However, there was with respect to which silhouette they thought would be the *happiest* ($\chi^2 = 30.59$, $p < 0.01$). The Black subjects chose a significantly larger silhouette (*Silhouette E*), than did their White counterparts (*Silhouette D*), as likely to be happiest. The Kruskal-Wallis test showed a statistically significant relationship between the subjects' BDS and which silhouette they felt would be the unhappiest, in the group overall ($p = 0.03$) and amongst the Black subjects ($p = 0.03$). Thus, in the Black ethnic group and in the group overall, subjects who had a more negative BDS – and therefore wanted to be thinner – chose the larger silhouettes as being

unhappiest, whereas those with a more positive BDS – and therefore wanted to be larger – chose the thinner silhouettes as being the unhappiest. Amongst the White subjects there was no statistically significant relationship between their BDS and the silhouette which they chose for being likely to be the unhappiest ($p = 0.84$ using the Kruskal-Wallis test). There was a statistically significant relationship ($p = 0.04$ using the Kruskal-Wallis test) in the group overall between the subjects' BDS and the silhouette which they thought would be the happiest. Those subjects with a more negative BDS felt that the thinner silhouettes would be happier, whereas those with a more positive BDS felt that the more overweight silhouettes would be happier. The Kruskal-Wallis test showed no statistically significant relationship between the subjects' BDS and the silhouette they felt would be the happiest in the Black subjects ($p = 0.06$) nor amongst the White subjects ($p = 0.38$).

Table 3.7: Silhouette chosen most often by the subjects for various physical and psychological attributes

Attribute	Silhouette chosen most often[%, (N)]		
	Mean BDS (SD)		
	Group overall (203)*	Black (165)*	White (31)
The girl that will look the best	Silhouette D 34.48 (70) Mean BDS: 0.00 (1.30) p < 0.01	Silhouette D 33.33 (55) Mean BDS: 0.00 (1.37) p = 0.04	Silhouette D 35.48 (11) Mean BDS: - 0.09 (1.04) p = 0.39
The girl that will be the clumsiest	Silhouette H 60.59 (123) Mean BDS: - 0.24 (1.67) p = 0.31	Silhouette H 63.64 (105) Mean BDS: - 0.24 (1.73) p = 0.49	Silhouette H 41.94 (13) Mean BDS: - 0.31 (1.32) p = 0.35
The girl that people will be most proud of	Silhouette E 30.05 (61) Mean BDS: - 0.30 (1.37) p = 0.01	Silhouette E 32.12 (53) Mean BDS: - 0.38 (1.39) p = 0.04	Silhouette C 32.26 (10) Mean BDS: - 0.20 (1.40) p = 0.08
The girl that people will be least proud of	Silhouette H 40.39 (82) Mean BDS: - 0.21 (0.19) p = 0.26	Silhouette H 36.36 (60) Mean BDS: - 0.08 (1.66) p = 0.08	Silhouette H 64.52 (20) Mean BDS: - 0.50 (1.15) p = 0.48
The girl that will be strongest	Silhouette H 37.93 (77) Mean BDS: - 0.31 (1.62) p = 0.21	Silhouette H 41.82 (69) Mean BDS: - 0.32 (1.61) p = 0.15	Silhouette B and Silhouette (E) 19.35 (6) Mean BDS: - 0.67 (1.51) 19.35 (6) Mean BDS: - 1.33 (0.52) p = 0.28
The girl that will be weakest	Silhouette A 65.52 (133) Mean BDS: - 0.18 (1.55) p = 0.33	Silhouette A 67.88 (112) Mean BDS: - 0.13 (1.61) p = 0.53	Silhouette A 51.61 (16) Mean BDS: - 0.63 (1.26) p = 0.81
The girl that will be the most unhappy	Silhouette H 40.39 (82) Mean BDS: - 0.73 (1.52) p = 0.03	Silhouette H 37.58 (62) Mean BDS: - 0.71 (1.65) p = 0.03	Silhouette H 51.61 (16) Mean BDS: - 0.75 (1.13) p = 0.38
The girl that will be the most happy	Silhouette D 20.20 (41) Mean BDS: - 0.05 (1.43) p = 0.04	Silhouette E 22.42 (37) Mean BDS: - 0.49 (0.29) p = 0.06	Silhouette D 32.26 (10) Mean BDS: - 0.60 (0.52) p = 0.38

Significance level: $p < 0.05$

*1 subject did not answer this question

There was a statistically significant difference between ethnic groups as to the silhouette they thought looked best ($\chi^2 = 25.14$, $p < 0.01$), people would be most proud of ($\chi^2 = 30.91$, $p < 0.01$), people would be least proud of ($\chi^2 = 18.78$, $p = 0.01$), would be strongest ($\chi^2 = 30.14$, $p < 0.01$), would be happiest ($\chi^2 = 30.59$, $p < 0.01$).

p-value refers to significance of relationship between subjects' BDS and their choice of silhouette for the various attributes.

Note: Silhouettes are associated with the specific BMI categories. *Silhouette A* (BMI category 1 – underweight): underweight, *Silhouettes B* (BMI category 2 – at risk of underweight) and *C* (BMI category 2 – at risk of underweight): at risk of underweight, *Silhouettes D* and *E*: healthy weight, *Silhouettes F* (BMI category 4 – at risk of overweight) and *G* (BMI category 4 – at risk of overweight): at risk of overweight, *Silhouette H* (BMI category 5 – overweight): overweight.

In summary for Section 3.4: Within the group overall, those subjects at a healthy weight were, on average, not satisfied with their weight in that they wanted to be thinner or larger. Within those not satisfied, a larger proportion had a negative BDS in that they wanted to be thinner than they perceived themselves to be, while the rest of those not satisfied had a positive BDS in that they wanted to be larger. Only 24% ($N = 29$) were satisfied with their weight as shown by their BDS of zero. It is therefore surprising that in the group overall, the Black ethnic group and the White ethnic group, the majority of subjects felt their weight was “just right” and more often than not they claimed that they do not worry about being thin. Also, while the majority of White subjects do worry about being fat, this was not the case for the group overall or within the Black group specifically, since they were more inclined towards not worrying about being fat.

The majority of subjects in the Black and White ethnic groups and in the group overall considered the thinnest silhouette, *Silhouette A* (BMI category 1 – underweight), to be thin and the largest silhouette, *Silhouette H* (BMI category 5 – overweight), to be fat. Although the majority of the group overall and of the Black subjects thought that *Silhouette E* (BMI category 3 – at a healthy weight) would be normal weight, the thinner silhouette *Silhouette D* (BMI category 3 – at a healthy weight) was chosen most by the White subjects for this answer. *Silhouette D* (BMI category 3 – at a healthy weight) was chosen the most by all three groups as looking the best, *Silhouette A* (BMI category 1 – underweight) was chosen the most as being the weakest; and *Silhouette H* (BMI category 5 – overweight) was chosen the most as being the clumsiest, the one that people will be least proud of and the unhappiest. The silhouette that was chosen most by subjects in the group overall and in the Black sector as being the silhouette that people would be most proud of was *Silhouette E* (BMI category 3 – at a healthy weight), whereas the White subjects chose *Silhouette C* (BMI category 2 – at risk of underweight) for this answer. The majority of subjects in the group overall and in the Black ethnic group thought that *Silhouette H* (BMI category 5 – overweight) would be the strongest, whereas the White subjects chose *Silhouette B* (BMI category 2 – at risk of underweight) or *Silhouette E* (BMI category 3 – at a healthy weight) for this answer. The subjects in the group overall and amongst the White subjects chose *Silhouette D* (BMI category 3 – at a healthy weight) most often as being the happiest, whereas *Silhouette E* was the most chosen answer by the Black subjects as to which silhouette would be the happiest.

3.5 SUBJECTS' BODY IMAGE PERCEPTION IN RELATION TO THEIR ACTUAL ANTHROPOMETRIC STATUS

3.5.1 Subjects' BMI in relation to which silhouette they felt looked most like themselves

The subjects were required to choose the silhouette from the Silhouette Perception Scale (Figure 2.2) which they felt looked most like themselves (Table 3.8). There was a statistically significant difference between the ethnic groups with respect to which silhouette they felt looked most like them ($\chi^2 = 39.68$, $p < 0.01$). The Black subjects saw themselves as significantly larger than the White subjects saw themselves.

3.5.1.1 Underweight subjects

The number falling into this category was very small. It is nevertheless relevant to note that in the group overall, the 2 subjects (1.00%) that fell into category 1 BMI (underweight) chose silhouettes larger than themselves as looking most like them: 1 subject (50.00%) chose *Silhouette C* (i.e. BMI category 2 – at risk of underweight) as looking most like her and 1 (50.00%) chose an the even larger *Silhouette D* (BMI category 3 – at a healthy weight). Similarly, the 1 subject (0.62%) in the Black ethnic group that fell into category 1 BMI (underweight) chose *Silhouette C* (BMI category 2 – at risk of underweight) as looking most like her, whereas *Silhouette A* (BMI category 1 – underweight) would have been the more accurate choice as regards how she actually looked. No children were underweight amongst the White subjects. Therefore, in the group as a whole and amongst the Black subjects, those who were underweight (although very small in number) saw themselves as being heavier than they actually were.

3.5.1.2 Subjects at risk of underweight

In the group overall, a total of 10 subjects (5.00%) - according to anthropometric measurements - fell into BMI category 2, which is equivalent to “at risk of underweight” *Silhouettes B or C*. When indicating which silhouette looked most like themselves, most of the 10 subjects chose one of three silhouettes, with each of the three featuring equally i.e. 30% ($N = 3$) chose *Silhouette A* (BMI category 1 – underweight), a silhouette thinner than themselves thus indicating that they perceived themselves to be thinner than they actually

were; 30% ($N = 3$) chose *Silhouette C* (BMI category 2 – at risk of underweight), thus perceiving themselves as they actually were; and 30% ($N = 3$) chose *Silhouette D* (BMI category 3 – at a healthy weight) which meant that they perceived themselves as heavier than they actually were. The remaining 10% ($N = 1$) also perceived themselves as heavier than they actually were i.e. chose *Silhouette E* (BMI category 3 – at a healthy weight).

In the Black ethnic group 8 subjects (4.94%) fell into BMI category 2 (i.e. at risk of underweight), with 50.00% choosing a larger silhouette than their own as the one they thought that they looked most like i.e. 37.50% ($N = 3$) of the Black subjects in this group chose *Silhouette D* (BMI category 3 – at a healthy weight) and 12.50% ($N = 1$) chose *Silhouette E* (BMI category 3 – at a healthy weight). The remainder were split, with 25.00% ($N = 2$) being accurate in that they chose *Silhouette C* (BMI category 2 – at risk of underweight) as looking most like them; and 25% ($N = 2$) chose *Silhouette A* (BMI category 1 – underweight) which was actually smaller than their own size. Therefore, once again, the tendency was towards perceiving themselves as heavier than they actually were.

For the White ethnic group the results were inconclusive i.e. only 2 subjects (6.45%) fell into BMI category 2 (i.e. at risk of underweight). Of these, 1 subject (50.00%) chose *Silhouette A* (BMI category 1 – underweight) as looking most like her and therefore perceived herself as thinner than she actually was, while the other 1 subject (50.00%) chose *Silhouette C* (BMI category 2 – at risk of underweight) as looking most like her and therefore was able to see herself as she actually was. No clear tendency thus emerged here.

3.5.1.3 Healthy weight subjects

In the group overall, 120 subjects (60.00%) fell into BMI category 3 (at a healthy weight). Of these, a total of 69.17% ($N = 83$) chose *Silhouette D* (BMI category 3 – at a healthy weight) or *Silhouette E* (BMI category 3 – at a healthy weight) as looking most like them and this indicated that they were able to see themselves as they actually were, i.e. *Silhouette D* (BMI category 3 – at a healthy weight) was chosen by 38.33% ($N = 46$) and *Silhouette E* (BMI category 3 – at a healthy weight) by 30.83% ($N = 37$). A smaller proportion (25.83%, $N = 31$) saw themselves as thinner than they actually are as indicated by their choice of one of *Silhouette A* (BMI category 1 - underweight), *Silhouette B* (BMI category 2 - at risk of underweight) or *Silhouette C* (BMI category 2 - at risk of underweight). A small proportion

(5.00%, $N = 6$) saw themselves as larger than they are as indicated by their choice of *Silhouette* F (BMI category 4 - at risk of overweight) or G (BMI category 4 - at risk for overweight).

In the Black ethnic group 96 subjects (59.26%) fell into BMI category 3 (at a healthy weight). Of those who were at a healthy weight, 40.63% ($N = 39$) chose *Silhouette* D (BMI category 3 – at a healthy weight) as looking most like them and 37.50% ($N = 36$) chose *Silhouette* E. Therefore, a total of 78.13 % ($N = 75$), the majority of the Black subjects in the healthy weight category, were able to see themselves as they actually were. The remainder were more likely to see themselves as thinner (17.71%, $N = 17$) than as fatter (4.16%, $N = 4$) than they were.

In the White ethnic group 20 subjects (64.52%) fell into BMI category 3 (i.e. at a healthy weight). Of those, 60.00% ($N = 12$) saw themselves as thinner than they are, with this splitting: 35.00% ($N = 7$) chose *Silhouette* C (BMI category 2 – at risk of underweight); 20% ($N = 4$) chose another at risk of underweight category *Silhouette* B (BMI category 2 – at risk of underweight); and 5.00% ($N = 1$) chose *Silhouette* A (BMI category 1 – underweight). None saw themselves as larger than they were. Overall 40.00% ($N = 8$) saw themselves as being at a healthy weight in that they chose *Silhouette* D (BMI category 3 – at a healthy weight) (35.00%, $N = 7$) or *Silhouette* E (BMI category 3 – at a healthy weight) (5.00%, $N = 1$) as the one that looked most like them.

3.5.1.4 Subjects at risk of overweight

In the group overall there were 28 subjects (14.00%) who fell into BMI category 4 (i.e. at risk of overweight). The silhouettes which correlate with BMI category 4 are *Silhouettes* F (BMI category 4 – at risk of overweight) and G (BMI category 4 – at risk of overweight). A total of 14.29% accurately chose one of these silhouettes as looking most like them i.e. *Silhouette* F was chosen by 14.29% ($N = 4$) and *Silhouette* G was not chosen at all. Of the remaining subjects, most (82.14%, $N = 23$) chose a silhouette thinner than themselves when selecting one which they thought looked most like themselves, with this splitting: 39.29% ($N = 11$) chose *Silhouette* E (BMI category 3 – at a healthy weight), 28.57% ($N = 8$) chose *Silhouette* D (BMI category 3 – at a healthy weight) and 14.29% ($N = 4$) chose thinner (i.e. “underweight” or “at risk of underweight”) *Silhouettes* A, B or C. Only 1 subject (3.57%) saw

herself as larger than she actually was, as indicated by her choice of *Silhouette H* (BMI category 5 –overweight) as looking most like her. Clearly, the majority of the subjects saw themselves as thinner than they actually were and primarily chose the “healthy weight” silhouettes as looking most like them.

In the Black ethnic group there were 24 subjects (14.81%) who fell into BMI category 4 (i.e. at risk of overweight). Of those, 1 (4.17%) saw herself as larger than she was, as indicated by her choice of *Silhouette H* (BMI category 5 – overweight), as looking most like her; 4 (16.67%) saw themselves as they were as indicated by their choice of *Silhouette F* (BMI category 4 – at risk of overweight); while the majority (79.17%, $N = 19$) saw themselves as thinner than they actually were and they mainly chose healthy weight categories as looking most like them i.e. the 79.17% splits as follows: *Silhouette E* (BMI category 3 – at a healthy weight) was chosen by 45.83% ($N = 11$) as looking most like them, *Silhouette D* (BMI category 3 – at a healthy weight) by 20.83% ($N = 5$) and the “underweight” or “at risk of underweight” silhouettes A, B or C by 12.50% ($N = 3$). Therefore the majority of the subjects saw themselves as thinner than they were and mainly perceived themselves as being at a healthy weight.

In the White ethnic group there were 3 subjects (9.68%) who fell into BMI category 4 (i.e. at risk of overweight). All of these 3 subjects (100.00%) chose *Silhouette D* (BMI category 3 – at a healthy weight) as looking most like them. Therefore, these subjects also saw themselves as thinner than they actually were, with the silhouette they perceived as looking most like them being the silhouette classified in Table 2.1 as representing someone “of a healthy weight”.

3.5.1.5 Overweight subjects

Silhouette H correlates with BMI category 5 (overweight). In the group overall there were 40 subjects (20.00%) who fell into BMI category 5 (overweight). Of these, all (100%, $N = 40$) saw themselves as thinner than they were, with 25.00% ($N = 10$) having chosen *Silhouette F* (BMI category 4 – at risk of underweight) as looking most like them, more than half (52.50%, $N = 21$) having chosen *Silhouette E* (BMI category 3 – at a healthy weight), another 20% ($N = 8$) also choosing a healthy weight category *Silhouette D* (BMI category 3 – at a healthy weight) and the remaining 2.50% ($N = 1$) having chosen the lowest category i.e. *Silhouette A*

(BMI category 1 – underweight). Thus, all the subjects saw themselves as thinner than they actually were and the silhouettes they chose show that they perceived themselves as being “at a healthy weight” rather than as overweight.

In the Black ethnic group, 33 subjects (20.37%) fell into BMI category 5 – overweight. Of these, all (100%) saw themselves as thinner than they were, with 30.30% ($N = 10$) having chosen *Silhouette* F (BMI category 4 – at risk of underweight) as looking most like them, 60.61% ($N = 20$) having chosen *Silhouette* E (BMI category 3 – at a healthy weight) and the remaining 9.09% ($N = 3$) having chosen *Silhouette* D (BMI category 3 – at a healthy weight) here too, as for the group as a whole, all the subjects thus saw themselves as thinner than they were and they primarily associated themselves with silhouettes portraying a “healthy weight” rather than overweight.

In the White ethnic group, 6 subjects (19.35%) fell into BMI category 5 (i.e. overweight). Of these, the majority (83.33%, $N = 5$) chose *Silhouette* D (BMI category 3 – at a healthy weight) as looking most like them and the remaining 1 subject (16.67%) chose an even thinner silhouette, *Silhouette* A. Therefore, here too all the subjects saw themselves as thinner than they were.

In the group overall the subjects mainly saw themselves as they were (45.00%, $N = 90$) or thinner (48.50%, $N = 97$) than they were and only 6.50% ($N = 13$) saw themselves as larger. Amongst the Black subjects there was a slight tendency to be more likely than the group as whole to correctly choose the relevant silhouette that looked most like them with 50.00% ($N = 81$) accurately identifying the silhouette that looked most like them, whereas 43.83% ($N = 71$) saw themselves as thinner than they were, and 6.17% ($N = 10$) saw themselves as larger than they were. Amongst the White subjects the majority 70.97% ($N = 22$) saw themselves as thinner than they were, 29.03% ($N = 9$) saw themselves as they actually were and none of the White subjects saw themselves as larger than they were.

Table 3.8: Subjects' choice of silhouette regarding "looking most like themselves" by the subjects' BMI

		Silhouette subject felt looked most like them (silhouettes arranged from thinnest to most overweight) [%; (N)]							
		1: Underweight	2: At risk of underweight		3: Healthy weight		4: At risk of overweight		5: Overweight
		<i>Silhouette A</i> (i.e. BMI category 1 – underweight)	<i>Silhouette B</i> (i.e. BMI category 2 – at risk of underweight)	<i>Silhouette C</i> (i.e. BMI category 2 – at risk of underweight)	<i>Silhouette D</i> (i.e. BMI category 3 – at a healthy weight)	<i>Silhouette E</i> (i.e. BMI category 3 – at a healthy weight)	<i>Silhouette F</i> (i.e. BMI category 4 – at risk of overweight)	<i>Silhouette G</i> (i.e. BMI category 4 – at risk of overweight)	<i>Silhouette H</i> (i.e. BMI category 5 – overweight)
BMI category	Ethnicity (N)								
	Group (200) Black (162) White (31)	Group (11) Black (8) White (3)	Group (8) Black (2) White (4)	Group (24) Black (15) White (8)	Group (66) Black (48) White (15)	Group (70) Black (68) White (1)	Group (18) Black (18) White (0)	Group (2) Black (2) White (0)	Group (1) Black (1) White (0)
1: Underweight	Group (2)	0.00 (0)	0.00 (0)	50.00 (1)	50.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
	Black (1)	0.00 (0)	0.00 (0)	100.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
	White (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
2: At risk of underweight	Group (10)	30.00 (3)	0.00 (0)	30.00 (3)	30.00 (3)	10.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)
	Black (8)	25.00 (2)	0.00 (0)	25.00 (2)	37.50 (3)	12.50 (1)	0.00 (0)	0.00 (0)	0.00 (0)
	White (2)	50.00 (1)	0.00 (0)	50.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
3: Healthy weight	Group (120)	4.17 (5)	5.83 (7)	15.83 (19)	38.33 (46)	30.83 (37)	3.33 (4)	1.67 (2)	0.00 (0)
	Black (96)	4.17 (4)	2.08 (2)	11.46 (11)	40.63 (39)	37.50 (36)	2.08 (2)	2.08 (2)	0.00 (0)
	White (20)	5.00 (1)	20.00 (4)	35.00 (7)	35.00 (7)	5.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)
4: At risk of overweight	Group (28)	7.14 (2)	3.57 (1)	3.57 (1)	28.57 (8)	39.29 (11)	14.29 (4)	0.00 (0)	3.57 (1)
	Black (24)	8.33 (2)	0.00 (0)	4.17 (1)	20.83 (5)	45.83 (11)	16.67 (4)	0.00 (0)	4.17 (1)
	White (3)	0.00 (0)	0.00 (0)	0.00 (0)	100.00 (3)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
5: Overweight	Group (40)	2.50 (1)	0.00 (0)	0.00 (0)	20.00 (8)	52.50 (21)	25.00 (10)	0.00 (0)	0.00 (0)
	Black (33)	0.00 (0)	0.00 (0)	0.00 (0)	9.09 (3)	60.61 (20)	30.30 (10)	0.00 (0)	0.00 (0)
	White (6)	16.67 (1)	0.00 (0)	0.00 (0)	83.33 (5)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)

Data in bold – subjects that correctly saw themselves as they actually are: Group overall: 45.00%, $N = 90$; Black subjects: 50.00%, $N = 81$; White subjects: 29.03%, $N = 9$

Data in blue – subjects that saw themselves as thinner than they actually are: Group overall: 48.50%, $N = 97$; Black subjects: 43.83%, $N = 71$; White subjects: 70.97%, $N = 22$

Data in green – subjects that saw themselves as larger than they actually are: Group overall: 6.50%, $N = 13$; Black subjects: 6.17%, $N = 10$; White subjects: 0.00%, $N = 0$

There was a statistically significant difference between the ethnic groups with respect to which silhouette they felt looked most like them ($\chi^2 = 39.68$, $p < 0.01$), whereby significantly more White subjects than Black subjects saw themselves as thinner than they actually are and significantly more Black subjects than White subjects saw themselves as they actually are.

3.5.2 Subjects' Selection of silhouette that they most wanted to look like

In Question 2.4, the subjects had to choose which silhouette they felt they most wanted to look like (Table 3.9). There was a statistically significant difference between the ethnic groups with respect to which silhouette the subjects most wanted to look like ($\chi^2 = 35.52$, $p < 0.01$).

Over half (52.22%, $N = 106$) of the total subjects wanted to look like either *Silhouette D* (BMI category 3 – at a healthy weight) or *Silhouette E* (BMI category 3 – at a healthy weight), with the score splitting: 29.56% ($N = 60$) and 22.66% ($N = 46$) for the two healthy weight silhouettes respectively. The remainder of the group more often opted for “underweight”/“at risk of underweight” silhouettes than for “overweight”/“at risk for overweight” silhouettes. Amongst the Black subjects, there was also emphasis on wanting to look like *Silhouette D* (BMI category 3 – at a healthy weight) which was chosen by 32.12% ($N = 53$) or *Silhouette E* (BMI category 3 – at a healthy weight) which was chosen by 26.06% ($N = 43$). A total of 58.18% ($N = 96$) thus wanted to look like one of these “healthy weight” silhouettes. The remainder of the Black subjects were more likely to select the “underweight”/“at risk of underweight” silhouettes than the “overweight”/“at risk for overweight” silhouettes.

The results for the White subjects were, however, very different in that the majority of the Whites chose categories towards the thinner silhouette side of the scale. A total of 74.20% ($N = 23$) chose lower body size categories i.e. 22.58% ($N = 7$) chose *Silhouette A* (BMI category 1 – underweight), 25.81% ($N = 8$) wanted to look like *Silhouette B* (BMI category 2 – at risk of underweight) and 25.81% ($N = 8$) wanted to look like *Silhouette C* (BMI category 2 – at risk of underweight). The remainder (25.80%, $N = 8$) chose *Silhouette D* (BMI category 3 – at a healthy weight) or *Silhouette E* (BMI category 3 – at a healthy weight) with the score splitting 19.35% ($N = 6$) and 6.45% ($N = 2$) respectively.

The results lead to the interpretation that the Black subjects wanted to look like a significantly larger silhouette than did the White subjects.

Table 3.9: Selection of silhouette the subjects felt they most wanted to look like

Ethnicity (N)	Silhouette %, (N)							
	Underweight	At risk of underweight		Healthy weight		At risk of overweight		Overweight
	A	B	C	D	E	F	G	H
Group overall (203)*	9.85 (20)	6.90 (14)	19.21 (39)	29.56 (60)	22.66 (46)	5.91 (12)	1.97 (4)	3.94 (8)
Black (165)*	7.27 (12)	3.03 (5)	16.97 (28)	32.12 (53)	26.06 (43)	7.27 (12)	2.42 (4)	4.85 (8)
White (31)	22.58 (7)	25.81 (8)	25.81 (8)	19.35 (6)	6.45 (2)	0.00 (0)	0.00 (0)	0.00 (0)

*1 subject did not answer this question

There was a statistically significant difference between the ethnic groups with respect to which silhouette the subjects most wanted to look like ($\chi^2 = 35.52$, $p < 0.01$).

3.5.3 Calculation and interpretation of the Body Dissatisfaction Score (BDS)

The BDS was the measure used in this study to determine the level of satisfaction a subject possesses with respect to her body. Use was made of the Silhouette Perception Scale (Figure 2.2), from which the subjects chose the silhouette they thought that they most looked like and the one that they ideally wanted to look like. The difference between the two scores yielded the BDS (Table 3.10). A negative BDS would imply that the subject wanted to lose weight, whereas a positive BDS would imply that she wanted to gain weight. For example, if the subject felt that she looked most like *Silhouette E* (BMI category 3 – at a healthy weight), but would have liked to look most like *Silhouette A* (BMI category 1 – underweight), then her BDS would be -4. Therefore, the more dissatisfied the subjects were with their bodies, the more negative or more positive the value of the subjects' BDS would be. In other words, the more they wanted to be thinner the more negative would be the BDS score and the more they wanted to be larger the more positive would be their BDS score. The closer the BDS score was to zero the more satisfied the subjects were with their weight.

There was no statistically significant difference ($p = 0.31$ using the Mann-Whitney test) found between the ethnic groups with respect to their BDS. Approximately half of the subjects in the overall sample (50.25%, $N = 102$), almost half of the Black subjects (49.09%, $N = 81$) and over half of the White subjects (54.84%, $N = 17$) had a negative BDS indicating that they wanted to lose weight. Of those subjects that had a negative BDS in the group overall (50.25%, $N = 102$), the majority (61.76%, $N = 63$) had a BDS of -1. Once again, similar results were seen in the Black and White ethnic groups. In the Black ethnic group, 81

(49.09%) of the subjects had a negative BDS score and of these 49 (60.49%) had a BDS of -1. In the White ethnic group, where 17 (54.84%) of the subjects had a negative BDS score, 11 (64.71%) had a BDS of -1 (Table 3.10).

Those subjects that had a positive BDS, meaning that they wanted to be larger than they thought they were, made up 28.57% ($N = 58$) of the total subjects, 30.91% ($N = 51$) of the Black subjects and only 16.13% ($N = 5$) of the White subjects.

Of those subjects in the group overall that had a positive BDS, over half (55.17%, $N = 32$) had a BDS of +1. Similar results were seen in the Black (52.94%, $N = 27$) and White ethnic groups (60.00%, $N = 3$). A BDS of zero, indicating satisfaction with their weight, was found in 21.18% ($N = 43$) of the overall sample, 20.00% ($N = 33$) of the Black subjects and 29.03% ($N = 9$) of the White subjects.

Table 3.10: Body Dissatisfaction Score (BDS) amongst the sample and between ethnic groups

Ethnicity (N)	BDS scores %, (N)						
	-3 to -7 score	-2 score	-1 score	0 score	+1 score	+2 score	+3 to +7 score
Group overall (203)*	5.91 (12)	13.30 (27)	31.03 (63)	21.18 (43)	15.76 (32)	6.90 (14)	5.91 (12)
Black (165)*	5.45 (9)	13.93 (23)	29.70 (49)	20.00 (33)	16.36 (27)	7.27 (12)	7.27 (12)
White (31)	9.68 (3)	9.68 (3)	35.48 (11)	29.03 (9)	9.68 (3)	6.45 (2)	0.00 (0)

*One subject did not answer this question

No significant difference was found between the ethnic groups

3.5.4 Subjects' BMI in relation to their BDS

In all 3 groups those subjects that had a category 1 BMI (BMI-for-age under the 5th percentile and therefore underweight) had a more positive BDS than those subjects with a BMI category 2 (BMI-for-age between the 5th and 15th percentile and therefore at risk for underweight), whereas those subjects who had a BMI category 3 (BMI-for-age between the 15th and 85th percentile and therefore at a healthy weight) had a BDS close to zero (Table 3.11). Similarly, those subjects that had a BMI category 5 (BMI-for-age above the 95th percentile and therefore overweight), had a more negative BDS than those with a BMI category 4 (BMI-for-age between the 85th and 95th percentile and therefore at risk of overweight). This means that those subjects that had a healthy BMI were also more likely to be happy with their bodies.

Those subjects that had category 1 or 2 BMI wanted to be larger, while those subjects with a category 4 or 5 BMI wanted to be thinner. There was a statistically significant negative correlation between the subjects' BMI and their BDS in the group overall (Spearman's $r = -0.35$, $p = 0.00$), the Black ethnic group (Spearman's $r = -0.33$, $p = 0.00$) and the White ethnic group (Spearman's $r = -0.55$, $p = 0.00$) This implies that the lower the BMI category that the subjects that fell into, the more positive the subjects' BDS (i.e. the more they wanted to be larger). On the other hand, those subjects fell into BMI category 3 had a BDS close to zero and thus were generally happy with their bodies. Also, the higher the BMI category that the subjects fell into, the more negative their BDS was, meaning the more they wanted to be thinner.

Table 3.11: Subjects' BMI category by their Body Dissatisfaction Score (BDS)

Ethnicity (N)	BMI category [% , (N)] Mean BDS (SD)					Spearman r-value, p-value
	1: Underweight	2: At risk of underweight	3: Healthy weight	4: At risk of overweight	5: Overweight	
Group overall (200)*	1.00 (2) Mean BDS: + 1.50 (0.71)	5.00 (10) Mean BDS: + 0.80 (1.55)	60.00 (120) Mean BDS: - 0.07 (1.68)	14.00 (28) Mean BDS: - 0.36 (1.68)	20.00 (40) Mean BDS: - 1.25 (1.43)	-0.35, < 0.01
Black (162)*	0.62 (1) Mean BDS: + 2.00 (0.00)	4.94 (8) Mean BDS: + 0.75 (1.67)	59.26 (96) Mean BDS: + 0.02 (1.82)	14.81 (24) Mean BDS: - 0.25 (1.78)	20.37 (33) Mean BDS: - 1.18 (1.36)	-0.33, < 0.01
White (31)	0.00 (0)	6.45 (2) Mean BDS: + 1.00 (1.41)	64.52 (20) Mean BDS: - 0.35 (0.81)	9.68 (3) Mean BDS: - 1.33 (0.58)	19.35 (6) Mean BDS: - 1.67 (1.97)	-0.55, < 0.01

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and the category their BMI is categorised as.

*4 subjects did not answer this question

In summary, a large proportion of the subjects in the group overall and of the White subjects, saw themselves as being thinner than they actually were (as shown by comparisons between BMI and silhouette they perceive themselves to look most like), while a large proportion of Black subjects saw themselves as the size that they actually were. In all 3 groups there was a statistically significant negative correlation between the subjects' BMI category and their

BDS. This means that as the subjects' BMI increased their BDS would decrease, whereas as the subjects' BMI decreased their BDS would increase. Therefore, those subjects who fell into a lower BMI category were also more likely to have a more positive BDS and thus want to gain weight, those that fell into BMI category 3 had a BDS close to zero and thus were generally happy with their bodies, whereas those that fell into a higher BMI category were also more likely to have a more negative BDS and thus want to lose weight. A large proportion of subjects in the group overall and in the Black sector wanted to look like *Silhouette D* (BMI category 3 – at a healthy weight) or *E* (BMI category 3 – at a healthy weight), which would classify them being at a healthy weight. However, a large proportion of White subjects wanted to look like *Silhouette B* (i.e. BMI category 2 – at risk of underweight) or *C* (i.e. BMI category 2 – at risk of underweight), which would classify them as at risk of underweight. A large proportion of subjects in all 3 groups had a negative BDS and thus wanted to lose weight, with the majority of these having a BDS of -1, which means they wanted to be 1 silhouette thinner than their current weight.

3.6 EFFECT OF VARIOUS FACTORS ON BODY IMAGE PERCEPTION

3.6.1 Socioeconomic status

There was a statistically significant difference between the ethnic groups with respect to household size (Table 3.12). The Black subjects had significantly more people living in the same house with them than did the White subjects ($p = 0.05$ using the Mann-Whitney test). A large number of people living under the same roof, as well as multiple children, are an indication of a poorer SES.⁷⁵⁻⁷⁷ The Black children were therefore assumed to be of a lower SES than the White children due to the higher average number of people living in their houses, as well as their higher average number of siblings. There was no statistically significant correlation found between the subjects' BDS and number of people living in the house, in the group overall (Spearman's $r = 0.10$, $p = 0.19$), in the Black ethnic group (Spearman's $r = 0.12$, $p = 0.14$) or in the White ethnic group (Spearman's $r = 0.03$, $p = 0.85$).

Table 3.12: Socioeconomic status of the subjects with respect to household size and number of siblings subjects had

Ethnicity (N)	Household size (i.e. average no. of people living in house)	Mean no. of siblings
Group overall (204)	5.12 p = 0.19, Spearman r = 0.10,	4.00 p = 0.50, Spearman r = 0.05
Black (166)	5.65 p = 0.14, Spearman's r = 0.12	4.37 p = 0.93, Spearman r = 0.01
White (31)	5.03 p = 0.85, Spearman's r = 0.03	2.03 p = 0.83, Spearman r = 0.04

Significance level: $p < 0.05$

p-value refers to correlation between BDS and household size in the 1st column and the correlation between BDS and no. of siblings.

There was a statistically significant difference between the ethnic groups with respect to household size ($p = 0.05$ using the Mann-Whitney test)

3.6.2 Family's weight control behaviours and attitudes towards eating and weight

3.6.2.1 Selection of silhouette subjects felt their family wanted them to look like

Question 3.1 required the subjects to choose which silhouette they felt their family would most want them to look like (Table 3.13). There was a statistically significant difference between the ethnic groups with respect to which silhouette the subjects felt their family wanted them to look like ($\chi^2 = 44.27$, $p < 0.01$). It was found that – on average - the silhouette which the Black subjects felt that their family wanted them to look like was significantly larger than the silhouette the White subjects felt their family wanted them to look like.

In the group overall, a total of just below two-thirds of the subjects (63.32%, $N = 126$), without knowing that these were the “healthy weight” silhouettes, selected either *Silhouette E* (BMI category 3 – at a healthy weight) (32.16%, $N = 64$) or *Silhouette D* (BMI category 3 – at a healthy weight) (31.16%, $N = 62$) as the silhouettes they felt that their family would most want them to look like. In the Black ethnic group, the focus was also on thinking that silhouettes E (BMI category 3 – at a healthy weight) and D (BMI category 3 – at a healthy weight) were the ones that their family would most want them to look like, with a total of over two-thirds (69.57%, $N = 112$) choosing one of these silhouettes as the one their families

would most like them to look like. More specifically, *Silhouette E* (BMI category 3 – at a healthy weight) was mentioned by 38.51% ($N = 62$) and *Silhouette D* (BMI category 3 – at a healthy weight) by 31.06% ($N = 50$). The Kruskal-Wallis test showed a statistically significant relationship between the subjects' BDS and the silhouette the subjects felt their family wanted them to look like in both the group overall ($p < 0.01$) and in the Black ethnic group ($p < 0.01$). Broadly-speaking, the more negative the subjects' BDS, the thinner the silhouette was that they chose as being what their families wanted them to look like, whereas the more positive the subjects' BDS, the larger the silhouette was that the subjects felt their families wanted them to look like.

Unlike the Black subjects and the group overall, who focused on the healthy weight categories as ones which their families would most like them to look like, White subjects reflected a tendency towards thinking that their families would want them to look like a silhouette on the lower half of the Silhouette Perception Scale i.e. 29.03% ($N = 9$) mentioned *Silhouette C* (BMI category 2 – at risk of underweight), 25.81% ($N = 8$) mentioned *Silhouette D* (BMI category 3 – at a healthy weight) and 22.58% ($N = 7$) mentioned *Silhouette B* (BMI category 2 – at risk of underweight). These scores show that over half (51.61%, $N = 16$) chose an “at risk of underweight” silhouette as the one their family would most like them to look like without knowing that it was classified as being in an “at risk of underweight” category and a further 25.81% ($N = 8$) chose the lower (thinner) one of the two “healthy weight” categories. Amongst the White subjects, there was no statistically significant relationship between the subjects' BDS and the silhouette the subjects felt their family wanted them to look like ($p = 0.17$ using the Kruskal-Wallis test).

There was a significant difference in the group overall ($\chi^2 = 116.58$, $p < 0.01$) and the White subjects ($\chi^2 = 32.03$, $p = 0.01$) between the silhouette that the subjects thought *looked most like themselves* (Table 3.8) and the silhouette that they felt their family would want them to look like (Table 3.13). There was no statistically significant difference in this regard in the Black subjects ($\chi^2 = 51.52$, $p = 0.38$). In the group overall, subjects felt that their family wanted them to look like the same-sized silhouette [*Silhouette D* (BMI category 3 – at a healthy weight) or *Silhouette E* (BMI category 3 – at a healthy weight)] than they felt they looked like themselves [*Silhouette D* (BMI category 3 – at a healthy weight) or *Silhouette E* (BMI category 3 – at a healthy weight)]. However, many of the subjects stated that they felt their family would like them to look like the largest silhouette, *Silhouette H* (BMI category 5

– overweight). The White subjects on average felt that their family would want them to be thinner [*Silhouette C* (BMI category 2 – at risk of underweight)] than the silhouette they felt looked most like themselves [*Silhouette D* (BMI category 3 – at a healthy weight)].

There was a significant difference in the group overall ($\chi^2 = 140.87$, $p < 0.01$), the Black subjects ($\chi^2 = 92.70$, $p < 0.01$) and the White subjects ($\chi^2 = 41.38$, $p < 0.01$) between the silhouette that the subjects *wanted to look like* (Table 3.9) and the silhouette that they felt their family would want them to look like (Table 3.13). On average the group overall and the Black subjects chose larger silhouettes for their answer as to the silhouette their families would like them to look like, in comparison to the silhouettes they chose for what they themselves would like to look like. The group overall focused on the family being likely to want them to look like *Silhouettes E or D* with 32.16% ($N = 64$) mentioning *Silhouette E* (BMI category 3 – at a healthy weight) and 31.16% ($N = 62$) mentioning *Silhouette D* (BMI category 3 – at a healthy weight). However, when choosing the silhouette they wanted to look like, the silhouette size, on average, was reduced i.e. 22.66% ($N = 46$) wanted to look like *Silhouette E* (BMI category 3 – at a healthy weight) and 29.56% ($N = 60$) like *Silhouette D* (BMI category 3 – at a healthy weight). Similarly, amongst Black subjects, the ones they mainly thought that their families wanted them to look like were *Silhouette E* (BMI category 3 – at a healthy weight) mentioned by 38.51% ($N = 62$) and *Silhouette D* (BMI category 3 – at a healthy weight) referred to by 31.06% ($N = 50$); whereas they focused on wanting to look like *Silhouette D* (BMI category 3 – at a healthy weight) (32.12%, $N = 53$) and *Silhouette E* (BMI category 3 – at a healthy weight) (26.06%, $N = 43$).

Amongst the White subjects, the silhouettes they thought that their family would want them to look like were, on average, larger than the silhouettes that they would prefer to be like. More specifically, they thought that their families would want them to look mainly like *Silhouette C* (BMI category 2 – at risk of underweight) (29.03%, $N = 9$), *D* (BMI category 3 – at a healthy weight) (25.81%, $N = 8$), or *B* (BMI category 2 – at risk of underweight) (22.58%, $N = 7$) yet they would personally like to look more like silhouettes in the bottom half of the scale (i.e. *Silhouettes A, B, or C*) (74.19%, $N = 23$), or the lower of the healthy weight silhouettes *Silhouette D* (19.35%, $N = 6$).

Table 3.13: Subjects' choice of silhouette that subjects felt their family would most want them to look like

Ethnicity (N)	Silhouette chosen %, (N) Mean BDS (SD)								p-value (Kruskal-Wallis)
	Underweight	At risk of underweight		Healthy weight		At risk of overweight		Overweight	
	A	B	C	D	E	F	G	H	
Group overall (199)*	6.53 (13) Mean BDS: -1.15 (0.45)	6.53 (13) Mean BDS: - 0.54 (0.45)	10.55 (21) Mean BDS: - 0.71 (0.36)	31.16 (62) Mean BDS: - 0.55 (0.21)	32.16 (64) Mean BDS: + 0.05 (0.20)	9.05 (18) Mean BDS: - 0.11 (0.39)	1.01 (2) Mean BDS: + 1.50 (1.16)	3.02 (6) Mean BDS: + 2.00 (0.67)	< 0.01
Black (161)*	4.97 (8) Mean BDS: - 1.13 (0.61)	3.11 (5) Mean BDS: +0.20 (0.77)	6.83 (11) Mean BDS: - 1.18 (0.52)	31.06 (50) Mean BDS: - 0.52 (0.24)	38.51 (62) Mean BDS: 0.00 (0.22)	10.56 (17) Mean BDS: - 0.06 (0.42)	1.24 (2) Mean BDS: + 1.50 (1.21)	3.73 (6) Mean BDS: + 2.00 (0.70)	< 0.01
White (31)	16.13 (5) Mean BDS: - 1.20 (0.53)	22.58 (7) Mean BDS: - 1.14 (0.44)	29.03 (9) Mean BDS: - 0.33 (0.39)	25.81 (8) Mean BDS: - 0.63 (0.42)	6.45 (2) Mean BDS: + 1.50 (0.83)	0.00 (0)	0.00 (0)	0.00 (0)	0.17

Significance level: $p < 0.05$

*5 subjects did not answer this question

p-value refers to significance of relationship between the subjects' BDS and which silhouette the subjects felt their family most wanted them to look like

Mean BDS shown for each silhouette refers to the mean BDS of subjects who selected that silhouette as the one which their families would most like them to look like.

There was a statistically significant difference between the ethnic groups with respect to which silhouette the subjects felt their family wanted them to look like ($\chi^2 = 44.27$, $p < 0.01$). Therefore the Black subjects felt that their family wanted them to be larger than the White subjects felt that their family would want them to be.

3.6.2.2 Family's comments on subjects' weight

In Question 3.2 the subjects were asked whether a family member had ever told them that they were thin and in Question 3.4 they were asked whether a family member had ever told them that they were fat (Table 3.14). There was a statistically significant difference between the ethnic groups with respect to whether the subjects had been told by a family member that they were thin ($\chi^2 = 13.05$, $p < 0.01$). Significantly more White subjects than Black subjects had been told by a family member that they were thin. There was no statistically significant difference between the ethnic groups with respect to whether they had been told by a family member that they were fat ($\chi^2 = 2.77$, $p = 0.10$).

In the group overall, there was a statistically significant difference ($p < 0.01$ using the Mann-Whitney test) found between the BDS of those subjects that had been told by their family that they were thin (47.26%, $N = 95$) and those that had not been told by their family that they were thin (52.74%, $N = 106$). Similarly, there was a statistically significant difference ($p = 0.05$ using the Mann-Whitney test) between the BDS of those subjects that had been told by their family that they were fat (32.99%, $N = 65$) and those that not been told by their family that they were fat (67.01%, $N = 132$). In the Black subjects, there was a statistically significant difference ($p < 0.01$ using the Mann-Whitney test) found between those subjects that had been told by the family that they were thin (41.46%, $N = 68$) and those that had not been told by their family that they were thin (58.54%, $N = 96$). Similarly, there was a statistically significant difference ($p = 0.03$ using the Mann-Whitney test) between those subjects that had been told by their family that they were fat (36.02%, $N = 58$) and those that had not been told that they were fat (63.98%, $N = 103$). More specifically, in the case of the subjects in the group overall, as well as in the Black ethnic group, those subjects that had been told by a family member that they were thin were more likely to have a more positive BDS (thus wanted to be larger), whereas those subjects who had not been told by any family that they were thin were more likely to have a more negative BDS (thus wanted to be thinner). Similarly in both the group overall and in the Black ethnic group, those subjects that had been told by a family member that they were fat, had a more negative BDS (thus wanted to be thinner) than those subjects who had not been told by a family member that they are fat, who had a BDS closer to zero (thus meaning that they were satisfied with their body shape).

In the White subjects, the Mann-Whitney test showed no statistically significant relationship between the subjects' BDS and being told by a family member that they were thin ($p = 0.13$) or fat ($p = 1.00$) respectively. The majority of White subjects had been told by a family member that they were thin (76.67%, $N = 23$) and – correspondingly – the majority of White subjects had not been told by a family member that they were fat (79.31%, $N = 23$). Therefore it appears that the white subjects' body satisfaction is less affected by their family's comments on their weight.

Table 3.14: Subjects' Body Dissatisfaction Score (BDS) in relation to whether a family member had commented on the subjects' weight

Ethnicity (N)	Subjects' BDS in relation to whether a family member had commented on subject being thin		p-value
	<div>% , (N)</div> <div>Mean BDS (SD)</div>		
	<i>Subject had been told by a family member that they were thin</i>	<i>Subject had <u>not</u> been told by a family member that they were thin</i>	
Group overall (201)*	47.26 (95) Mean BDS: + 0.03 (0.17)	52.74 (106) Mean BDS: - 0.58 (0.16)	<0.01
Black (164)**	41.46 (68) Mean BDS: + 0.21 (0.21)	58.54 (96) Mean BDS: - 0.51 (0.18)	<0.01
White (30)***	76.67 (23) Mean BDS: - 0.52 (0.25)	23.33 (7) Mean BDS: - 1.29 (0.45)	0.13
	Subjects' BDS in relation to whether a family member had commented on subject being fat		
	<div>% , (N)</div> <div>Mean BDS (SD)</div>		
	<i>Subject had been told by a family member that they were fat</i>	<i>Subject had <u>not</u> been told by a family member that they were fat</i>	
Total (N = 197)****	32.99 (65) Mean BDS: - 0.75 (0.21)	67.01 (132) Mean BDS: - 0.11 (0.15)	0.05
Black (N = 161)*****	36.02 (58) Mean BDS: - 0.78 (0.23)	63.98 (103) Mean BDS: + 0.01 (0.17)	0.03
White (29)**	20.69 (6) Mean BDS: - 0.50 (0.55)	79.31 (23) Mean BDS: - 0.61 (0.28)	1.00

Significance level: $p < 0.05$

*3 subjects did not answer this question

** 2 subjects did not answer this question

*** 1 subject did not answer this question

**** 7 subjects did not answer this question

***** 5 subjects did not answer this question

p-value refers to the significance of the relationship between the subjects' BDS and whether the subject had been told by a family member that they were thin or fat respectively.

There was a statistically significant difference between the ethnic groups with respect to whether the subjects had been told by a family member that they were thin ($\chi^2 = 13.05$, $p < 0.01$).

There was no statistically significant difference between the ethnic groups with respect to whether they had been told by a family member that they were fat ($\chi^2 = 2.77$, $p = 0.10$).

3.6.2.3 Family's weight status and weight control behaviours

Question 3.6 required the subjects to indicate whether any of their family members were fat and this was followed by Question 3.7, which required them to identify which family member(s) was/were fat (Table 3.15). There was a statistically significant difference between the ethnic groups with respect to whether they had a family member that was fat ($\chi^2 = 8.35$, $p < 0.01$), with significantly more Black subjects having had an overweight family member. There was also a statistically significant difference between the ethnic groups with respect to having had an overweight grandparent ($\chi^2 = 11.09$, $p < 0.01$). White subjects were significantly more likely to have had a grandparent that was overweight. However, there was no statistically significant difference between the ethnic groups with respect to having an overweight mother ($\chi^2 = 0.27$, $p = 0.60$), father ($\chi^2 = 2.31$, $p = 0.13$), brother ($\chi^2 = 0.15$, $p = 0.70$) or sister ($\chi^2 = 3.07$, $p = 0.08$). In the group overall, in the Black ethnic group and in the White ethnic group, there was no statistically significant relationship between the BDS and having a fat family member ($p = 0.46$, 0.68 and 0.28 respectively) (Table 3.15). In both the group overall ($p = 0.02$) and amongst the Black subjects ($p = 0.02$), there was a statistically significant relationship between the subjects' BDS and having an overweight grandparent. Therefore, those subjects that had a negative BDS were also more likely to have an overweight grandparent. The White subjects had no statistically significant relationship between their BDS and any of their family members being overweight.

Table 3.15: Body Dissatisfaction Score (BDS) in relation to having one or more overweight family members

Ethnicity (N)	Family member overweight [% , (N)] Mean BDS (SD)					
	Any family member	Mother	Father	Brother	Sister	Grandparent
Group overall (203)*	83.74 (170) Mean BDS: - 0.34 (1.71) p = 0.46	44.71 (76) Mean BDS: - 0.12 (1.66) p = 0.13	18.24 (31) Mean BDS: - 0.58 (2.02) p = 0.24	11.76 (20) Mean BDS: - 0.45 (1.61) p = 0.78	24.12 (41) Mean BDS: - 0.49 (1.96) p = 0.92	30.59 (52) Mean BDS: - 0.79 (1.35) p = 0.03
Black (165)*	87.27 (144) Mean BDS: - 0.26 (1.77) p = 0.64	45.83 (66) Mean BDS: - 0.08 (1.72) p = 0.19	13.33 (22) Mean BDS: - 0.55 (2.18) p = 0.24	11.81 (17) Mean BDS: - 0.53 (1.70) p = 0.90	26.39 (38) Mean BDS: - 0.42 (2.02) p = 0.78	26.39 (38) Mean BDS: - 0.84 (1.37) p = 0.02
White (31)	64.52 (20) Mean BDS: - 0.80 (1.32) p = 0.28	40.00 (8) Mean BDS: +0.38 (1.06) p = 0.37	30.00 (6) Mean BDS: - 0.83 (2.04) p = 0.87	15.00 (3) Mean BDS: 0.00 (1.00) p = 0.24	10.00 (2) Mean BDS: - 1.00 (0.00) p = 0.75	65.00 (13) Mean BDS: - 0.77 (1.30) p = 0.63

Significance level: $p < 0.05$

*1 subject did not answer this question

p-value refers to the significance of the relationship between the subjects' BDS and whether they had a family member that was overweight

There was a statistically significant difference between the ethnic groups with respect to whether they had been a family member that was fat ($\chi^2 = 8.35$, $p < 0.01$) and with respect to having an overweight grandparent ($\chi^2 = 11.09$, $p < 0.01$).

No statistically significant difference was found between the ethnic groups with respect to having an overweight mother ($\chi^2 = 0.27$, $p = 0.60$), father ($\chi^2 = 2.31$, $p = 0.13$), brother ($\chi^2 = 0.15$, $p = 0.70$), sister ($\chi^2 = 3.07$, $p = 0.08$).

Question 3.8 required the subjects to answer whether any of their family members had tried to lose weight (Table 3.16). In neither the Black nor White ethnic groups was there a statistically significant relationship between the subjects' BDS and their having had a family member that had attempted weight loss, regardless of which family member had attempted weight loss. There was however a statistically significant difference between the ethnic groups with respect to having had a family member who had tried to lose weight ($\chi^2 = 4.78$, $p = 0.03$), as well with respect to it having been the father ($\chi^2 = 5.81$, $p = 0.02$) or grandparent ($\chi^2 = 4.09$, $p = 0.04$) who had tried to lose weight with significantly more White subjects than Black subjects having had a family member, father or grandparent who had attempted to lose

weight. However there was no statistically significant difference between the ethnic groups with respect to it being the subjects' mother ($\chi^2 = 2.08$, $p = 0.15$), brother ($\chi^2 = 1.95$, $p = 0.16$) or sister ($\chi^2 = 0.96$, $p = 0.33$) who had tried to lose weight.

It also must be noted from Tables 3.15 and 3.16 that a high proportion of subjects' mothers in both ethnic groups were overweight and had tried to lose weight.

Table 3.16: Body Dissatisfaction Score (BDS) in relation to having a family member who had attempted to lose weight

Ethnicity (N)	Family member had attempted to lose weight [% , (N)]					
	Mean BDS (SD)					
	Any family member	Mother	Father	Brother	Sister	Grandparent
Group overall (204)	80.89 (165) Mean BDS: - 0.34 (1.68) p = 0.39	59.39 (98) Mean BDS: - 0.37 (1.52) p = 0.47	14.55 (24) Mean BDS: - 0.33 (2.14) p = 0.94	9.70 (16) Mean BDS: 0.00 (1.71) p = 0.26	20.60 (34) Mean BDS: - 0.47 (1.73) p = 0.67	20.60 (34) Mean BDS: - 0.41 (1.35) p = 0.88
Black (166)	78.31 (130) Mean BDS: - 0.28 (1.77) p = 0.34	56.92 (74) Mean BDS: - 0.31 (1.57) p = 0.51	10.00 (13) Mean BDS: - 0.31 (2.87) p = 0.98	8.46 (11) Mean BDS: - 0.18 (1.94) p = 0.69	22.31 (29) Mean BDS: - 0.34 (1.76) p = 0.98	17.69 (23) Mean BDS: - 0.35 (1.43) p = 0.90
White (31)	93.55 (29) Mean BDS: - 0.59 (1.32) p = 0.55	68.97 (20) Mean BDS: - 0.55 (1.43) p = 0.92	27.59 (8) Mean BDS: - 0.38 (0.74) p = 0.78	17.24 (5) Mean BDS: +0.40 (1.14) p = 0.10	13.79 (4) Mean BDS: - 1.00 (1.63) p = 0.49	34.48 (10) Mean BDS: - 0.70 (1.16) p = 0.74

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and whether they had a family member who had tried to lose weight.

There was a statistically significant difference between the ethnic groups with respect to having a family member who had tried to lose weight ($\chi^2 = 4.78$, $p = 0.03$), having the father being the family member who had tried to lose weight ($\chi^2 = 5.81$, $p = 0.02$) or a grandparent being the family member who had tried to lose weight ($\chi^2 = 4.09$, $p = 0.04$). There was no statistically significant difference between the ethnic groups with respect to the mother ($\chi^2 = 2.08$, $p = 0.15$), brother ($\chi^2 = 1.95$, $p = 0.16$) or sister ($\chi^2 = 0.96$, $p = 0.33$) having had tried to lose weight.

In summary for Section 3.6.2, the majority of subjects in the group overall and in the Black ethnic group felt that their family wanted them to be at a healthy weight. However, a high

proportion of White subjects felt that their family wanted them to be at a body size which would classify them as being at risk of underweight. A significant majority of White subjects had been told by a family member that they are thin, whereas a high proportion of subjects in all 3 groups had not been told by a family member that they are fat. The majority of subjects in all 3 groups had an overweight family member, of whom it was most likely to be the mother or grandparent that was overweight in all 3 groups. Those subjects in the group overall and in the Black ethnic group were more likely to want to lose weight if their grandparent was overweight. In addition, the White subjects were significantly more likely to have a family member who had tried to lose weight.

3.6.3 Weight control behaviours

3.6.3.1 Attempts to lose weight

Question 4.1 required the subjects to answer whether or not they were trying or had ever tried to lose weight i.e. irrespective of whether it be at the time of the study or in the past (Table 3.17). In the group overall, approximately half the subjects (50.98%, $N = 104$) had been involved in trying to lose weight and approximately half had not (49.02%, $N = 100$). Furthermore, in this group overall, there was a statistically significant difference ($p = 0.00$ using the Mann-Whitney test) between the BDS of the subjects who had been involved in trying to lose weight and the BDS of those who had not. In the Black ethnic group, just under half (47.59%, $N = 79$) had tried to lose weight and just over half had not tried to lose weight (52.41%, $N = 87$). Here too, there was a significant difference ($p = 0.02$ using the Mann-Whitney test) between the BDS of those in the Black ethnic group who had been involved in trying to lose weight and the BDS of those that had not. Thus, in the overall group and in the Black sector, those that had tried to lose weight had a significantly more negative BDS than were those who had not tried to lose weight, indicating that they were more dissatisfied with their bodies.

There were a higher percentage of White subjects who had been involved in weight loss practices – 61.29% versus only 47.59% of Black subjects. However, this difference between ethnic groups was not statistically significant ($\chi^2 = 1.97$, $p = 0.16$). Similarly, although White subjects who had been involved in trying to lose weight seemed to have a more negative BDS than those who were not/had not been involved in trying, there was no statistically significant

difference ($p = 0.13$ using the Mann-Whitney test) between the BDS of the White subjects who had been involved in trying to lose weight in comparison with the BDS of those who had not.

Table 3.17: Percentage distribution of subjects who had attempted weight loss by subjects' Body Dissatisfaction Score (BDS)

Ethnicity (N)	Weight loss attempted %, (N)	Mean BDS (SD)	p-value
Group overall (204)	Yes 50.98 (104)	- 0.59 (1.68)	0.00
	No 49.02 (100)	+ 0.01 (1.66)	
Black (166)	Yes 47.59 (79)	- 0.52 (1.77)	0.02
	No 52.41 (87)	+ 0.03 (1.75)	
White (31)	Yes 61.29 (19)	- 0.89 (1.41)	0.13
	No 38.71 (12)	- 0.17 (0.94)	

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and whether the subjects had attempted to lose weight

3.6.3.2 Past slimming practices

Question 4.2 required the subjects to state what methods they had used to try to lose weight (Table 3.18). There was no statistically significant difference between the ethnic groups with respect to whether the subjects had tried eating less ($\chi^2 = 0.01$, $p = 0.91$), exercising more ($\chi^2 = 0.00$, $p = 0.99$), skipping meals ($\chi^2 = 2.88$, $p = 0.09$), fasting ($\chi^2 = 0.67$, $p = 0.41$) or weight loss medications ($\chi^2 = 0.07$, $p = 0.79$) to lose weight. There was a statistically significant difference between the ethnic groups with respect to whether they had used methods to lose weight other than those listed in the questionnaire ($\chi^2 = 9.42$, $p < 0.01$). Significantly more White than Black subjects had used "other" methods to lose weight. In addition, a larger proportion of White subjects (31.58%, $N = 6$) than Black subjects (14.10%, $N = 11$) had used "skipping meals" as a weight loss method.

The results show that the most common weight loss methods which the subjects used in the group overall, amongst Black subjects and amongst White subjects were: exercising more (44.67%, $N = 46$; 42.31, $N = 33$; 42.11%, $N = 8$ respectively) and eating less (42.72%, $N = 44$; 43.59%, $N = 34$; 42.11%, $N = 8$ respectively).

Table 3.18: Weight loss methods used by the subjects to lose weight

Ethnicity (N)	Weight loss methods used					
	%, (N)					
	Mean BDS (SD)					
	p-value					
	<i>Eat less</i>	<i>Exercise more</i>	<i>Skip meals</i>	<i>Don't eat the whole day</i>	<i>Weight loss medications</i>	<i>Other</i>
All (103)	42.72 (44) Mean BDS: - 0.66 (1.71) p = 0.88	44.67 (46) Mean BDS: - 0.65 (1.44) p = 0.97	17.48 (18) Mean BDS: - 1.06 (1.83) p = 0.45	15.53 (16) Mean BDS: - 0.38 (1.78) p = 0.87	3.89 (4) Mean BDS: - 0.75 (0.96) p = 0.98	16.50 (17) Mean BDS: - 0.65 (1.93) p = 0.59
Black (78)	43.59 (34) Mean BDS: - 0.56 (1.80) p = 0.95	42.31 (33) Mean BDS: - 0.67 (1.45) p = 0.87	14.10 (11) Mean BDS: - 1.36 (1.96) p = 0.27	17.95 (14) Mean BDS: - 0.29 (1.90) p = 0.66	3.85 (3) Mean BDS: - 1.00 (1.00) p = 0.54	10.26 (8) Mean BDS: - 0.50 (2.51) p = 0.93
White (19)	42.11 (8) Mean BDS: - 1.25 (1.39) p = 0.41	42.11 (8) Mean BDS: - 0.75 (1.67) p = 0.90	31.58 (6) Mean BDS: - 0.83 (1.60) p = 0.97	10.53 (2) Mean BDS: - 1.00 (0.00) p = 0.95	5.26 (1) 0.00 *	42.11 (8) Mean BDS: - 0.63 (1.41) p = 0.49

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and the method the subjects had used to lose weight

* = too few cases for analysis of these variables

3.6.3.3 Past attempts to gain weight

Question 4.3 required the subjects to state whether, in the past or at the time of the study, they had been involved in trying to gain weight (Table 3.19). There was a statistically significant difference between the ethnic groups with respect to whether the subjects had tried/were

trying to gain weight ($\chi^2 = 8.44$, $p < 0.01$). The majority of the overall subjects had not tried to gain weight (71.29%, $N = 144$), but there was a difference between the responses of the Black and White ethnic groups. Amongst the Black subjects, the ratio of those who indicated no involvement with trying to gain weight to those who did indicate involvement was 66.46% ($N = 109$): 33.54% ($N = 55$), while amongst the White subjects the ratio was even more heavily oriented towards not being involved in trying to gain weight, 90.32% ($N = 28$): 9.68% ($N = 3$). Therefore, a larger proportion of subjects tried to lose weight rather than gain weight in all 3 groups, but this proportion was particularly large in the White ethnic group. There was no statistically significant relationship between the subjects' BDS and whether they had tried to gain weight before, either in the group as a whole, in the Black sector or in the White sector.

**Table 3.19: Subjects who had previously attempted to gain weight
by their Body Dissatisfaction Score (BDS)**

Ethnicity (N)	%, (N) Mean BDS (SD)	p-value
Group overall (202)*	28.71 (58) - 0.17 (1.80)	0.60
Black (164)*	33.54 (55) - 0.22 (1.81)	0.97
White (31)	9.68 (3) + 0.67 (1.53)	0.14

Significance level: $p < 0.05$

*2 subjects did not answer this question

p-value refers to the significance of the relationship between the subjects' BDS and whether the subjects had attempted to gain weight

There was a statistically significant difference between the ethnic groups with respect to whether the subjects had tried to gain weight in the past or present ($\chi^2 = 8.44$, $p < 0.01$), with significantly more Black subjects having tried to gain weight than White subjects.

3.6.3.4 Weight gain methods used

Question 4.4 required those subjects who had tried (or were trying) to gain weight to select the method of weight gain which they had been involved in (Table 3.20). There was no statistically significant difference between the ethnic groups with respect to which weight gain method the subjects, in reference to the weight gain methods of eating more ($\chi^2 = 0.52$, $p = 0.47$), exercising less ($\chi^2 = 1.71$, $p = 0.19$), eating more meals ($\chi^2 = 0.20$, $p = 0.66$). There

was however a statistically significant difference between the ethnic groups with respect to whether the subjects had employed weight gain methods other to those listed ($\chi^2 = 5.39$, $p = 0.02$). Significantly more White subjects chose “other” as a weight gain method.

The Mann-Whitney test showed a statistically significant relationship between trying to gain weight through exercising less and the subjects’ BDS, in both the overall group ($p = 0.03$) and the Black ethnic group ($p = 0.04$), with those that chose exercising less as a means of gaining weight being more likely to have a negative BDS. Amongst those in the group overall who indicated involvement in trying to gain weight, the most common weight gain method used was to “eat more food” (53.45%, $N = 31$). This was also the most common method used amongst the Black subjects who indicated involvement in weight gain (54.55%, $N = 30$). In the case of the White subjects, there were too few subjects who had tried to gain weight to glean meaningful statistics.

Table 3.20: Weight gain methods used by the subjects to gain weight

Ethnicity (N)	Weight gain method %, (N) Mean BDS (SD) p-value			
	<i>Eat more</i>	<i>Exercise less</i>	<i>Eat more meals</i>	<i>Other</i>
Group overall (58)	53.45 (31) Mean BDS: - 0.55 (1.89) $p = 0.08$	24.14 (14) Mean BDS: - 1.14 (1.66) $p = \mathbf{0.03}$	22.41 (13) Mean BDS: + 0.23 (2.55) $p = 0.28$	12.07 (7) Mean BDS: + 0.14 (1.07) $p = 0.41$
Black (55)	54.55 (30) Mean BDS: - 0.53 (1.93) $p = 0.16$	25.45 (14) Mean BDS: - 1.14 (1.66) $p = \mathbf{0.04}$	21.82 (12) Mean BDS: + 0.08 (2.61) $p = 0.44$	9.09 (5) Mean BDS: + 0.20 (1.10) $p = 0.38$
White (3)	33.33 (1)*	0.00 (0)*	33.33 (1)*	66.67 (2)*

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects’ BDS and what methods they had used to gain weight

* = too few cases for further analysis of variables

3.6.3.5 Weight control behaviours and attitudes

Questions 4.5 to 4.9 involved obtaining more insight into the subjects' weight control behaviours and attitudes (Table 3.21). All subjects were asked these questions, irrespective of whether they said that they have ever tried to lose or gain weight.

Question 4.5 required the subjects to state whether they thought about getting thinner when they exercised. There was a statistically significant difference between the ethnic groups in this regard ($\chi^2 = 5.29$, $p = 0.02$). The White subjects were significantly more likely to think about getting thinner during exercise than were the Black subjects, i.e. many of the subjects in the overall group (58.62%, $N = 119$) and in the Black sector (54.82%, $N = 91$) claimed to think about getting thinner when they exercise, whereas amongst the White subjects, over three-quarters said that they think about getting thinner when they exercise (76.67%, $N = 23$). The Mann-Whitney test showed a statistically significant relationship between thinking about getting thinner during exercise and BDS in both the group overall ($p < 0.01$) and in the Black sector ($p < 0.01$). Therefore, within the group overall and amongst Black subjects, those who had thought about getting thinner when they exercise were also more likely to have a negative BDS. This indicated that they wanted to lose weight. However, in the White sector, there was no statistically significant relationship between BDS and thinking about getting thinner while exercising ($p = 0.18$ using the Mann-Whitney test) (Table 3.21). Thus, within the White sector, thinking about getting thinner while exercising does not necessarily depend on whether or not the BDS shows that they feel that they need to be thinner.

Question 4.6 asked all subjects whether they avoided sugary foods. There was a statistically significant difference between the ethnic groups with respect to whether the subjects avoided sugary foods ($\chi^2 = 4.20$, $p = 0.04$). The Black subjects were significantly more likely to have avoided sugary foods (52.12%, $N = 86$) than were the White subjects (32.26%, $N = 10$). In the group overall, results were similar to those in the Black ethnic group i.e. as shown over half of the subjects in the Black ethnic group (52.12%, $N = 86$) tried to avoid foods with a high sugar content and in the group overall just under half claimed to do so (48.77%, $N = 99$). The Mann-Whitney test showed a statistically significant relationship between those subjects that tried to avoid sugar and the subjects' BDS in the group overall ($p = 0.02$), as well as in the Black ethnic group ($p = 0.05$) (Table 3.21). This means that those subjects in the group overall and in the Black ethnic group that avoided sugary foods were also more likely to have

a more negative BDS and thus wanted to lose weight. There was no statistically significant relationship between avoiding sugar and the subjects' BDS in the White ethnic group.

Question 4.7 asked all subjects whether they consumed diet foods. There was no statistically significant difference between the ethnic groups with respect to whether or not the subjects consumed diet foods ($\chi^2 = 1.66$, $p = 0.20$). Also, there were no significant differences between the BDS of those that did consume diet foods and those that did not in any of the three groups (Table 3.21). In the group overall, more subjects did not eat diet food (53.23%, $N = 107$) than did (46.77%, $N = 94$) and amongst the Black subjects more claimed that they did not eat diet food (56.10%, $N = 92$) than claimed that they did (43.90%, $N = 72$). However, amongst White subjects, the opposite applied in that more said that they did eat diet foods (56.67%, $N = 17$) than said that they did not (43.33%, $N = 13$). .

Question 4.8 asked all subjects whether they avoided starchy foods. There was no statistically significant difference between the ethnic groups with respect to whether the subjects avoided starchy foods ($\chi^2 = 2.90$, $p = 0.09$). Also, there was no statistically significant relationship between the subjects' BDS and whether they avoided starch (Table 3.21). The majority of subjects in the group overall (79.70%, $N = 161$), within the Black sector (81.82%, $N = 135$), and within the White sector (67.74%, $N = 21$), did not avoid starchy foods.

Question 4.9 asked the subjects whether they felt guilty after eating sweets. The tendency was more *towards* feeling guilty after eating sweets, in both the group overall (53.96%, $N = 109$) and amongst the Black subjects (54.55%, $N = 90$). However, amongst the White subjects the tendency to feel guilty after eating sweets was not quite as marked (48.39%, $N = 15$). There was, however, no statistically significant difference between the ethnic groups with respect to whether the subjects felt guilty after eating sweets ($\chi^2 = 0.40$, $p = 0.53$). In the White ethnic group there was no statistically significant relationship between the BDS of those subjects that did feel guilty after eating sweets and the BDS of those that did not feel guilty after eating sweets ($p = 0.28$ using the Mann-Whitney test). The Mann-Whitney test did show a statistically significant relationship in this regard in the group overall ($p = 0.02$) and in the Black ethnic group ($p = 0.05$) (Table 3.21). Therefore subjects in the group overall and in the Black ethnic group who felt guilty after eating sweets were more likely to have a negative BDS.

Table 3.21: Weight control behaviours participated in by subjects

Ethnicity (N)	%, (N)	Mean BDS (SD)	p-value
<i>Think about getting thinner when exercising</i>			
Group overall (203)*	58.62 (119)	- 0.59 (1.81)	<0.01
Black (166)	54.82 (91)	- 0.58 (1.94)	<0.01
White (30)*	76.67 (23)	- 0.74 (1.32)	0.18
<i>Avoid sugary foods</i>			
Group overall (203)*	48.77 (99)	- 0.48 (1.62)	0.02
Black (165)*	52.12 (86)	- 0.40 (1.68)	0.05
White (31)	32.26 (10)	- 1.00 (1.15)	0.26
<i>Eat diet foods</i>			
Group overall (201)***	46.77 (94)	- 0.38 (1.57)	0.53
Black (164)**	43.90 (72)	- 0.33 (1.61)	0.51
White (30)*	56.67 (17)	- 0.65 (1.50)	0.70
<i>Avoid starchy foods</i>			
Group overall (202)**	20.30 (41)	- 0.24 (1.95)	0.69
Black (165)*	18.18 (30)	+ 0.03 (2.06)	0.27
White (31)	32.26 (10)	- 1.00 (1.49)	0.25
<i>Feel guilty after eating sweets</i>			
Group overall (202)**	53.96 (109)	- 0.56 (1.46)	0.01
Black (165)*	54.55 (90)	- 0.47 (1.51)	0.05
White (31)	48.39 (15)	- 0.93 (1.16)	0.28

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and whether they participated in the specific weight control behaviours

*1 subject did not answer this question

**2 subjects did not answer this question

***3 subjects did not answer this question

There was a statistically significant difference between the ethnic groups with respect to whether the subjects thought about getting thinner during exercise ($\chi^2 = 5.29$, $p = 0.02$) and whether they avoided sugary foods ($\chi^2 = 4.20$, $p = 0.04$). There was no statistically significant difference between the ethnic groups with respect to whether the subjects ate diet foods ($\chi^2 = 1.66$, $p = 0.20$), avoided starchy foods ($\chi^2 = 2.90$, $p = 0.09$), or felt guilty after eating sweets ($\chi^2 = 0.40$, $p = 0.53$).

In summary for Section 3.6.3, the majority of subjects in the group overall, Black subjects and White subjects had tried to lose weight in the past with eating less and exercising more being the most common methods to do so. In the group overall and Black subjects, there was a significant relationship between BDS and whether the subjects had tried to lose weight in the

past. Therefore those subjects that had tried to lose weight were more likely to have a negative BDS. A significantly greater proportion of subjects (in all 3 groups) had tried to lose weight rather than gain weight. However in the case of those subjects who had tried to gain weight the most common method to do so was by increased food consumption through “eating more food,” with decreased exercise next in line but used less frequently as a weight gain method.

With respect to weight control behaviours, different behaviours are seen among the ethnic groups. The majority of subjects in all 3 groups think about getting thinner during exercise, the majority of subjects in the Black ethnic group avoid sugary foods, the majority of White subjects eat diet foods and the majority of subjects in the group overall and Black subjects feel guilty after eating sweets. White subjects were significantly more likely than Black subjects to think about getting thinner during exercise, while Black subjects were significantly more likely than White subjects to avoid sugary foods.

3.6.4 Peer influences

3.6.4.1 *Subjects’ choice of the silhouette that their peers wanted them to look like versus their BDS*

Subjects had to select the silhouette that they felt their peers would ideally like them to look like. This answer was then analysed in relation to the subjects’ BDS (Table 3.22).

There was a statistically significant difference between the ethnic groups with respect to which silhouette the subjects felt their peers wanted them to look like ($\chi^2 = 22.79$, $p < 0.01$). In the group as a whole and in the Black ethnic group, the focus was on peers wanting them to look like *Silhouettes* D or E (the healthy weight silhouettes). In the overall group 34.85% ($N = 69$) mentioned *Silhouette* D (BMI category 3 – at a healthy weight) and 28.28% ($N = 56$) *Silhouette* E (BMI category 3 – at a healthy weight) as the one their peers would want them to look like. Similarly, amongst Black subjects, 34.38 % ($N = 55$) mentioned *Silhouette* D (BMI category 3 – at a healthy weight) and 33.13% ($N = 53$) mentioned *Silhouette* E (BMI category 3 – at a healthy weight) as the silhouette their peers would like them to look like. However, in the White ethnic group the subjects chose mainly *Silhouette* C (22.58%, $N = 7$) or *Silhouette* D (BMI category 3 – at a healthy weight) (29.03%, $N = 9$) as the silhouette that they thought that their peers would want them to look like.

The Kruskal-Wallis test showed no statistically significant relationship in the group overall ($p = 0.09$), in the Black ethnic group ($p = 0.08$) nor in the White ethnic group ($p = 0.32$) between the silhouette that the subjects thought that their friends would want them to look like and their BDS.

There was a statistically significant difference in the group overall ($\chi^2 = 104.45$, $p < 0.01$), amongst the Black subjects ($\chi^2 = 69.23$, $p = 0.03$) and amongst the White subjects ($\chi^2 = 46.56$, $p < 0.01$) between the silhouette the subjects most wanted to look like themselves (Table 3.9) and the silhouette that they felt their peers most wanted them to look like (Table 3.22) More specifically, in the group overall and in the Black ethnic group, significantly more of those subjects that wanted be a similar size to the larger silhouettes *Silhouettes* G (BMI category 4 – at risk of overweight) and H (BMI category 5 – overweight), thought that their peers would want them to be thinner than they wanted for themselves. In the White ethnic group, the subjects thought that their peers would want them, on average, to be significantly larger than they wanted for themselves.

Table 3.22: Silhouette subjects felt their peers most wanted them to look like in relation to subjects' Body Dissatisfaction Score (BDS)

Ethnicity (N)	Silhouette chosen as the one peers most wanted them to look like %, (N) Mean BDS (SD)								p-value
	Under-weight	At risk of underweight		Healthy weight		At risk of overweight		Over-weight	
	A	B	C	D	E	F	G	H	
Group overall (198)*	9.60 (19) Mean BDS: - 0.58 (0.39)	6.57 (13) Mean BDS: - 0.08 (0.47)	14.14 (28) Mean BDS: - 0.96 (0.32)	34.85 (69) Mean BDS: - 0.12 (0.20)	28.28 (56) Mean BDS: - 0.20 (0.22)	3.03 (6) Mean BDS: - 0.50 (0.69)	1.01 (2) Mean BDS: - 0.50 (1.19)	2.53 (5) Mean BDS: + 1.60 (0.75)	0.09
Black (160)*	8.13 (13) Mean BDS: - 0.15 (0.49)	3.75 (6) Mean BDS: + 0.17 (0.73)	12.50 (20) Mean BDS: - 0.95 (0.40)	34.38 (55) Mean BDS: - 0.05 (0.24)	33.13 (53) Mean BDS: - 0.25 (0.24)	3.75 (6) Mean BDS: - 0.50 (0.73)	1.25 (2) Mean BDS: - 0.50 (1.26)	3.13 (5) Mean BDS: + 1.60 (0.80)	0.08
White (31)	19.35 (6) Mean BDS: - 1.50 (0.50)	19.35 (6) Mean BDS: - 0.33 (0.50)	22.58 (7) Mean BDS: - 0.86 (0.46)	29.03 (9) Mean BDS: - 0.44 (0.41)	9.68 (3) Mean BDS: - 0.67 (0.70)	0.00 (0)	0.00 (0)	0.00 (0)	0.32

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and which silhouette the subjects felt their peers most wanted them to look like

*6 subjects did not answer this question

3.6.4.2 Subjects' actual silhouette versus peers' ideal silhouette

There was a statistically significant difference in the group overall ($\chi^2 = 116.58$, $p < 0.01$), amongst the Black subjects ($\chi^2 = 90.11$, $p < 0.01$) and amongst the White subjects ($\chi^2 = 29.16$, $p = 0.02$) between the silhouette which the subjects thought looked most like themselves and the silhouette which they felt their peers most wanted them to look like (Table 3.23).

Subjects in the overall group chose *Silhouette* E (BMI category 3 – at a healthy weight) most frequently as the silhouette they thought they most looked like (34.80%, $N = 71$), with *Silhouette* D (BMI category 3 – at a healthy weight) coming a close second (32.83%, $N = 65$). With regard to the silhouette the subjects thought that their peers would want them to look like, 34.85% ($N = 69$) of the group overall chose *Silhouette* D (BMI category 3 – at a healthy weight) and 28.28% ($N = 56$) thought that their peers would want them to look like *Silhouette* E (BMI category 3 – at a healthy weight).

As can be seen in Table 3.23, amongst the White subjects, the choice of which silhouette looked most like them more often than not correlated with the silhouette they thought their peers wanted them to look like. However, those who perceived themselves as looking like one of the three silhouettes at the thinner end of the scale were more likely to think that their friends would like them to look like that silhouette i.e. of the 15 likening themselves to *Silhouette* A (BMI category 1 – underweight), *Silhouette* B (BMI category 2 – at risk of underweight) or *Silhouette* C (BMI category 2 – at risk of underweight), 66.67% ($N = 10$) thought that their friends would like them to look like that silhouette. Of the 16 who perceived themselves as looking like one of the silhouettes around the middle of the scale i.e. *Silhouette* D (BMI category 3 – at a healthy weight) or *Silhouette* E (BMI category 3 – at a healthy weight), 50.00% ($N = 10$) thought that their friends would like them to look like that silhouette and most of the remainder (37.50%, $N = 6$) thought that their friends would like them to look like a silhouette thinner than the one they saw themselves as. In the White subjects, there were significantly more subjects that answered that they felt that their friends would want them to look like the thinner *Silhouettes* A (BMI category 1 – underweight) (19.35%, $N = 6$) and B (BMI category 2 – at risk of underweight) (19.35%, $N = 6$) than answered that they looked most like these silhouettes (9.68%, $N = 3$ and 12.90% and $N = 4$) respectively. Therefore, there was a clear tendency for the White subjects to feel that their peers would want them to be thinner.

As can be seen in Table 3.23, the Black girls' choice of which silhouette they most looked like did not correlate with their peers' choice as closely. Of the 7 girls that thought they most looked like *Silhouette* A (BMI category 1 – underweight), 3 thought that their friends would want them to look like that silhouette, but 4 thought that their friends would want them to be like a silhouette larger than that one. Also, of the 3 girls that thought they looked most like *Silhouette* B (BMI category 2 – at risk of underweight), all thought that their peers would

want them to look like a silhouette larger than that one. Similar results were found amongst those girls who chose *Silhouette C* (BMI category 2 – at risk of underweight) as looking most like them. However those girls that chose *Silhouettes D* (BMI category 3 – at a healthy weight) and *E* (BMI category 3 – at a healthy weight) as looking most like them (i.e. the silhouettes the majority of subjects considered to be “normal”) were more likely to feel that their peers are accepting of their weight. In more detail, of the 47 girls that felt they looked most like *Silhouette D* (BMI category 3 – at a healthy weight), 55.32% ($N = 26$) thought that their peers were happy with the way they looked, while 23.40% ($N = 11$) thought that their peers wanted them to have the slightly larger body size of *Silhouette E* (BMI category 3 – at a healthy weight). Of the 69 that chose *Silhouette E* (BMI category 3 – at a healthy weight) as looking most like them, 53.62% ($N = 37$) thought that their peers were happy with their body sizes, followed by 23.19% ($N = 16$) thinking that their friends would want them to be like the slightly thinner *Silhouette D* (BMI category 3 – at a healthy weight). There was a different result amongst those Black girls that chose one of the larger silhouettes as looking most like them i.e. the majority (80.95%, $N = 17$) of those who chose *Silhouettes F* (BMI category 4 – at risk of overweight), *G* (BMI category 4 – at risk of overweight) or *H* (BMI category 5 – overweight), felt that their peers wanted them to be at least two silhouettes thinner.

Thus, broadly-speaking, Black girls who perceived themselves as falling into the mid-range of the Silhouette Perception Scale (“at a healthy weight”) primarily thought that their friends would like them to look as they are, those perceiving themselves as similar to a silhouette towards the thinner end of the scale tended to think that their friends would like them to be larger than they are and those seeing themselves as being in a category at the larger end of the scale perceived their friends as being likely to want them to be thinner than they are.

Table 3.23: Silhouette subjects felt looked most like them vs. Silhouette they felt their peers wanted them to look like

			Ethnicity (N)	Silhouette that subjects felt their peers wanted them to look like								
				Underweight	At risk of underweight		Healthy weight		At risk of overweight		Overweight	
				A	B	C	D	E	F	G	H	
				Group overall (198)* Black (160)* White (31)	Group (19) Black (13) White (6)	Group (13) Black (6) White (6)	Group (28) Black (20) White (7)	Group (69) Black (55) White (9)	Group (56) Black (53) White (3)	Group (6) Black (6) White (0)	Group (2) Black (2) White (0)	Group (5) Black (5) White (0)
Silhouette that subjects felt they looked most like %, (N)	Underweight	A	Group (10)	50.00 (5)	10.00 (1)	20.00 (2)	10.00 (1)	0.00 (0)	10.00 (1)	0.00 (0)	0.00 (0)	
			Black (7)	42.86 (3)	0.00 (0)	28.57 (2)	14.29 (1)	0.00 (0)	14.29 (1)	0.00 (0)	0.00 (0)	
			White (3)	66.67 (2)	33.33 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	
	At risk of underweight	B	Group (9)	11.11 (1)	44.44 (4)	0.00 (0)	33.33 (3)	0.00 (0)	0.00 (0)	0.00 (0)	11.11 (1)	
				Black (3)	0.00 (0)	0.00 (0)	0.00 (0)	66.67 (2)	0.00 (0)	0.00 (0)	0.00 (0)	33.33 (1)
				White (4)	25.00 (1)	75.00 (3)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
		C	Group (24)	12.50 (3)	12.50 (3)	29.17 (7)	29.17 (7)	12.50 (3)	0.00 (0)	4.17 (1)	0.00 (0)	
				Black (15)	20.00 (3)	13.33 (2)	6.67 (1)	40.00 (6)	13.33 (2)	0.00 (0)	6.67 (1)	0.00 (0)
				White (8)	0.00 (0)	12.50 (1)	62.50 (5)	12.50 (1)	12.50 (1)	0.00 (0)	0.00 (0)	0.00 (0)
	Healthy weight	D	Group (65)	9.23 (6)	3.08 (2)	10.77 (7)	55.38 (36)	20.00 (13)	0.00 (0)	0.00 (0)	1.54 (1)	
				Black (47)	6.38 (3)	2.13 (1)	10.64 (5)	55.32 (26)	23.40 (11)	0.00 (0)	0.00 (0)	2.13 (1)
				White (15)	20.00 (3)	6.67 (1)	13.33 (2)	46.67 (7)	13.33 (2)	0.00 (0)	0.00 (0)	0.00 (0)
		E	Group (69)	1.45 (1)	1.45 (1)	8.70 (6)	26.09 (18)	53.62 (37)	4.35 (3)	0.00 (0)	4.35 (3)	
				Black (67)	1.49 (1)	1.49 (1)	8.96 (6)	23.88 (16)	55.22 (37)	4.48 (3)	0.00 (0)	4.48 (3)
				White (1)	0.00 (0)	0.00 (0)	0.00 (0)	100.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
	At risk of overweight	F	Group (18)	16.67 (3)	11.11 (2)	27.78 (5)	22.22 (4)	11.11 (2)	11.11 (2)	0.00 (0)	0.00 (0)	
				Black (18)	16.67 (3)	11.11 (2)	27.78 (5)	22.22 (4)	11.11 (2)	11.11 (2)	0.00 (0)	0.00 (0)
				White (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
		G	Group (2)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	50.00 (1)	0.00 (0)	50.00 (1)	0.00 (0)	
				Black (2)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	50.00 (1)	0.00 (0)	50.00 (1)	0.00 (0)
		White (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)		
	Overweight	H	Group (1)	0.00 (0)	0.00 (0)	100.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	
				Black (1)	0.00 (0)	0.00 (0)	100.00 (1)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)
				White (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)

*6 subjects did not answer this question

Data in bold – subjects that felt that their peers wanted them to look like they actually are:Group overall: 46.46%, $N = 92$ Black subjects: 43.75%, $N = 70$ White subjects: 54.84%, $N = 17$

Data in blue – subjects that felt that their peers wanted them to be thinner than they actually are:

Group overall: 33.33%, $N = 66$ Black subjects: 35.00%, $N = 56$ White subjects: 29.03%, $N = 9$

Data in green - subjects that felt that their peers wanted them to be larger than they actually are

Group overall: 20.20%, $N = 40$ Black subjects: 23.13%, $N = 34$ White subjects: 16.13%, $N = 5$

There was a statistically significant difference between which silhouette the subjects felt their family wanted them to look like versus which silhouette the subjects felt their peers wanted them to look like in the group overall ($\chi^2 = 128.96$, $p < 0.01$), in the Black ethnic group ($\chi^2 = 67.03$, $p = 0.04$) and in the White ethnic group ($\chi^2 = 73.06$, $p < 0.01$). In the group overall and in the Black ethnic group, the subjects felt that their peers would want them to be significantly thinner than their family wanted them to be, whereas in the White sector subjects felt that their family wanted them to be significantly thinner than their peers wanted them to be.

3.6.4.3 Peers' classification of subjects' weights

Subjects also had to answer a question on whether a peer had ever told them they were thin or fat (Table 3.24). There was a statistically significant difference between the ethnic groups with respect to whether the subjects had been told by a peer that they were thin ($\chi^2 = 10.94$, $p < 0.01$). Therefore a significantly higher proportion of White subjects than Black subjects had been told by their peers that they were thin. However, there was no statistically significant difference between the ethnic groups with respect to whether the subjects had been told by a peer that they were fat ($\chi^2 = 1.25$, $p = 0.26$).

No statistically relationship was seen in the group overall between the BDS and those subjects that had been told by a peer that they were thin ($p = 0.29$ using the Mann-Whitney test) (Table 3.24). In the group overall, there was a statistically significant relationship ($p < 0.01$ using the Mann-Whitney test) between whether the subjects had been told by a peer that they were fat and their BDS (Table 3.24). Therefore, those subjects that been told by a peer that they were fat were also more likely to want to lose weight.

In the Black subjects, there was no statistically significant relationship between the subjects' BDS and being told by a peer that they were thin ($p = 0.53$ using the Mann-Whitney test). There was a statistically significant relationship ($p < 0.01$ using the Mann-Whitney test) between whether the subjects had been told by a peer that they were fat and their BDS. Therefore those subjects that had been told by a peer that they were fat were also more likely to have a more negative BDS and thus wanted to be thinner.

In the White subjects, the Mann-Whitney test showed no statistically significant relationship between the subjects' BDS and being told by a peer that they were thin ($p = 0.30$) or fat ($p = 0.47$) respectively.

Therefore in the group overall and in the Black subjects, it appears that the peers' opinion of the subjects' weight is more likely to affect their body satisfaction than it is to affect the White subjects' body satisfaction. This is due to the finding that those subjects in the group overall and the Black ethnic group that had been told by a peer that they were fat were more likely to have a negative BDS and therefore to want to be thinner.

Table 3.24: Body Dissatisfaction Score (BDS) in relation to whether the subjects have been told by a peer that they are thin or fat

Ethnicity (N)	% (N) Mean BDS (SD)	p-value
	<i>Subject has been told by a peer that they are thin</i>	
Group overall (203)*	34.98 (71) Mean BDS: - 0.11 (0.20)	0.29
Black (165)*	29.70 (49) Mean BDS: - 0.04 (0.25)	0.53
White (31)	61.29 (19) Mean BDS: - 0.42 (0.29)	0.30
	<i>Subject has been told by a peer that they are fat</i>	
Group overall (201)**	26.37 (53) Mean BDS: - 0.81 (0.23)	<0.01
Black (163)**	28.83 (47) Mean BDS: - 0.79 (0.25)	<0.01
White (31)	80.65 (25) Mean BDS: - 1.00 (0.53)	0.47

Significance level: $p < 0.05$

*1 subject did not answer this question

**3 subjects did not answer this question

p-value refers to the significance of the relationship between the subjects' BDS and whether the subjects had been told by a peer that they were thin or fat respectively

There was a statistically significant difference between the ethnic groups with respect to whether the subjects had been told by a peer that they were thin ($\chi^2 = 10.94$, $p < 0.01$).

There was no statistically significant difference between the ethnic groups with respect to whether the subjects had been told by a peer that they were fat ($\chi^2 = 1.25$, $p = 0.26$).

The Mann-Whitney test showed no statistically significant difference in the BDS in the group overall of those subjects that had been told by their family they were thin and those that had been told by their peers that they are thin ($p = 0.18$), nor between those that had been told by their family they were fat and those that had been told by their peers that they are fat ($p = 0.42$).

3.6.4.4 Effect of peers attempting to lose weight on subjects' BDS

Subjects had to answer a question on whether they had a friend who had tried to lose weight (Table 3.25). Overall, 46.77% ($N = 94$) of the subjects had friends who had attempted weight loss. There was no statistically significant difference between the ethnic groups with regard to whether the subjects had a friend who had tried to lose weight ($\chi^2 = 0.81$, $p = 0.37$). Also, in the group overall, there was a statistically significant relationship between those subjects who had a friend who had tried to lose weight and the subjects' BDS ($p = 0.05$ using the Mann-Whitney test). The Mann-Whitney test showed no statistically significant relationship in this regard in Black ($p = 0.08$) or White subjects ($p = 0.34$).

Therefore, in the group overall it appears that those subjects with a friend who had attempted weight loss were significantly more likely to have a BDS of zero and therefore were happier with their weight, whereas those who had not had a friend who had attempted to lose weight were more likely to have a negative BDS and therefore more likely to want to lose weight themselves. This is counterintuitive, as one would expect the girls' weight loss attempts and body image perception to be influenced by their friends' attitudes and behaviours. However, according to these findings this does not appear to be the case. These findings may be explained as those subjects who had friends who had tried to lose weight, were more likely to be put off the thought of having to undergo the process of weight loss and thus were satisfied with their own weight.

Table 3.25: Subjects' Body Dissatisfaction Score (BDS) and whether they have had peers who have attempted to lose weight

Ethnicity (N)	%, (N)	p-value
	Mean BDS (SD)	
Group overall (201)*	46.77 (94) Mean BDS: - 0.06	0.05
Black (163)*	46.01 (75) Mean BDS: + 0.03	0.08
White (31)	54.84 (17) Mean BDS: - 0.41	0.34

Significance level: $p < 0.05$

*3 subjects did not answer this question

p-value refers to the significance of the relationship between the subjects' BDS and whether they had had peers who had attempted to lose weight

There was no statistically significant difference between the ethnic groups with respect to whether the subjects had a friend who had tried to lose weight ($\chi^2 = 0.81$, $p = 0.37$).

In summary for Section 3.6.4, one can conclude that the subjects in the group overall feel that their friends want them to be at a healthy weight. The subjects also are not necessarily influenced by whether their friends have tried to lose weight, but they – in the case of the group overall and in the Black ethnic group – are influenced by their friends' opinion of their weight (i.e. whether a friend has told them they are fat). These results thus indicate that Black girls feel more pressure from or are more influenced by the opinions of their peers with respect to their body size than are White girls.

3.6.5 Societal (i.e. media and cultural influences)

3.6.5.1 Subjects' perceptions of "thinness"

Attributes associated with a girl who is "thin"

In Question 5.1, the subjects had to indicate which of a list of attributes or character traits they associate with a girl of their own age who is "thin" (Table 3.26). In the group overall, a large proportion of the subjects felt that if a girl was thinner she would be more popular ("have more friends" 63.96%), have a better self esteem ("feel better about herself" 69.63%), be more attractive ("be prettier" 69.11%), be more feminine ("feel more like a girl" 73.80%) and be healthier ("be healthier" 66.84%) (Table 3.26).

There was a statistically significant difference between the ethnic groups with respect to whether the subjects thought if a girl was thinner she would be more popular ($\chi^2 = 8.71$, $p < 0.01$). The Black subjects were significantly more likely than the White subjects to feel that if a girl was thin she would be more popular (i.e. 68.75% of Black subjects as compared to 40.00% of White subjects thought that if a girl was thin she would “have more friends”). There was also a statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was thin she would be prettier ($\chi^2 = 7.83$, $p = 0.01$). Significantly more Black subjects than White subjects (73.38% of Black subjects and 46.67% of White subjects) thought that a girl would be prettier if she was thinner. Similarly, there was a statistically significant difference between the ethnic groups with respect to whether the subjects thought if a girl was thinner she would feel more feminine (i.e. “feel more like a girl”) ($\chi^2 = 3.87$, $p = 0.05$). Significantly more Black subjects than White subjects thought that a girl would feel more feminine if she was thinner (i.e. 76.82% of the Black ethnic group and 58.62% of the White ethnic group claimed that a girl who is thin would “feel more like a girl”).

There was no statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was thin she would feel better about herself ($\chi^2 = 3.52$, $p = 0.06$) nor with respect to whether the subjects thought that if a girl was thin she would be healthier ($\chi^2 = 0.98$, $p = 0.32$). Both the Black and the White subjects strongly associated these two characteristics with a girl who is thin. Those who thought that a girl who is thin would feel better about herself comprised 66.68% of Black subjects and 83.33% of White subjects and those who thought that if a girl is thin she would be healthier comprised 65.16% of Black subjects and 74.19% of White subjects. Although at first glance the White subjects seemed to reflect higher scores for these two factors, the small sample size for White subjects renders the difference between the scores for White subjects and those for Black subjects as not being statistically significant. It can however be said that the White subjects were more likely to attribute better self-esteem (i.e. feeling “better about herself”) and better health (“she will be healthier”) than any of the other attributes to a girl who is thin, whereas amongst the Black subjects all the characteristics investigated were strongly associated with a girl who is thin.

Relationship between BDS and subjects' answers relating to various attributes in association with a girl who is thin

The Mann-Whitney test showed no statistical significance in the group as a whole ($p = 0.15$), nor in the White ethnic group ($p = 0.67$), between the BDS of those girls that felt that a girl their age would have more friends if she was thin and the BDS of those that did not feel this way. However, in the Black ethnic group, there was a statistically significant relationship between those who felt that a thin girl would have more friends and their BDS ($p = 0.04$ using the Mann-Whitney test), with the mean BDS for those subjects that answered "yes she would have more friends" being -0.43 and those that answered "no she would not have more friends" being 0.18 . Therefore, amongst the Black subjects, those that felt a thin girl would be more popular were more likely to have a negative BDS and thus were more likely to want to lose weight themselves (Table 3.26).

With regard to whether a girl would feel better about herself if she was thin, the Mann-Whitney test showed no statistically significant link between those subjects who felt that a thin girl would feel better about herself and their BDS i.e. neither in the group overall ($p = 0.20$) nor in the Black ethnic group ($p = 0.48$). However, in the White ethnic group, there was a statistically significant relationship in this regard ($p = 0.02$ using the Mann-Whitney test). This means that those girls that want to be thinner themselves [mean BDS: -0.96 (1.06)], are also more likely to think that they will feel better about themselves if they lose weight (Table 3.26).

There was no statistically significant relationship in any of the three groups (Table 3.26) with respect to those subjects that thought that if a girl was thin she will be prettier and the subjects' BDS. Also, with regard to whether a girl who was thin was more likely to feel more feminine, there was no statistically significant relationship between any of the three groups' answer to this question and the subjects' BDS (Table 3.26). They were also asked whether a girl who was thin will be healthier. Once again, there was no statistically significant relationship between any of the three groups' answer to this question and the subjects' BDS (Table 3.26).

Table 3.26: Subjects' perception of "thinness" by their Body Dissatisfaction Score (BDS)

Ethnicity (N)	%, (N)	Mean BDS	p-value
	<i>If a girl your age is thin she will have more friends</i>		
All (197) 7 subjects did not answer this question	63.96 (126)	- 0.44 (1.78)	0.15
Black (160) 6 subjects did not answer this question	68.75 (110)	- 0.43 (1.83)	0.04
White (30) 1 subject did not answer this question	40.00 (12)	- 0.58 (1.56)	0.66
	<i>If a girl your age is thin she will feel better about herself</i>		
All (191) 13 subjects did not answer this question	69.63 (133)	- 0.38 (1.69)	0.20
Black (154) 12 subjects did not answer this question	66.88 (103)	- 0.26 (1.81)	0.48
White (30) 1 subject did not answer this question	83.33 (25)	- 0.96 (1.06)	0.02
	<i>If a girl your age is thin she will be prettier</i>		
All (191) 13 subjects did not answer this question	69.11 (132)	- 0.48 (1.70)	0.09
Black (154) 12 subjects did not answer this question	73.38 (113)	- 0.41 (1.77)	0.11
White (30) 1 subject did not answer this question	46.67 (14)	- 1.07 (1.14)	0.13
	<i>If a girl your age is thin she will feel more like a girl</i>		
All (187) 17 subjects did not answer this question	73.80 (138)	- 0.37 (1.65)	0.47
Black (151) 15 subjects did not answer this question	76.82 (116)	- 0.33 (1.73)	0.22
White (29) 2 subjects did not answer this question	58.62 (17)	- 0.71 (1.16)	0.91
	<i>If a girl your age is thin she will be healthier</i>		
All (193) 11 subjects did not answer this question	66.84 (129)	- 0.40 (1.66)	0.21
Black (155) 11 subjects did not answer this question	65.16 (101)	- 0.30 (1.79)	0.39
White (31)	74.19 (23)	- 0.70 (1.33)	0.68

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and whether the subject attributed certain characteristics to a girl being "thin"

A statistically significant difference between the ethnic groups was found w.r.t whether the subjects thought if a girl was thinner she'd be more popular ($\chi^2 = 8.71$, $p < 0.01$). A statistically significant difference was found between the ethnic groups with respect to whether the subjects thought if a girl was thinner she'd be prettier ($\chi^2 = 7.83$, $p = 0.01$). A statistically significant difference was found between the ethnic groups with respect to whether the subjects thought if a girl was thinner she'd be more feminine ($\chi^2 = 3.87$, $p = 0.05$). There was no statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was thin that she would feel better about herself ($\chi^2 = 3.52$, $p = 0.06$) nor with respect to whether the subjects thought that if a girl was thin that she would be healthier ($\chi^2 = 0.98$, $p = 0.32$).

3.6.5.2 Subjects' perceptions of "fatness"

Attributes associated with a girl who is "fat"

The subjects then had to choose which of the same attributes to assign to a girl who was fat (Table 3.27). There was no statistically significant difference between the ethnic groups with regard to whether the subjects thought that if a girl was fat she would be more popular ($\chi^2 =$

2.42, $p = 0.12$), or healthier ($\chi^2 = 3.10$, $p = 0.08$). Of the Black subjects 56.52% ($N = 91$) thought that a fat girl would be more popular and 40.74% ($N = 11$) of the White girls thought this; while 50.00% ($N = 77$) of the Black subjects thought that a fat girl would be healthier and 32.14% ($N = 9$) of the White subjects thought this. However, there was a statistically significant difference between the ethnic groups with regard to whether the subjects thought that if a girl was fat she would feel better about herself ($\chi^2 = 10.77$, $p < 0.01$). Significantly more Black subjects (56.69%, $N = 89$) than White subjects (24.14%, $N = 7$) felt that if a girl was fatter she would feel better about herself. There was also a statistically significant difference between the ethnic groups with respect to whether the subjects thought that a girl who was fat would be prettier ($\chi^2 = 14.74$, $p < 0.01$). Once again, significantly more Black subjects (57.32%, $N = 90$) than White subjects (18.52%, $N = 5$) felt that if a girl was fatter she would be prettier. In addition, there was a statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was fat she would be more feminine ($\chi^2 = 7.02$, $p < 0.01$). Significantly more Black subjects (62.66%, $N = 99$) than White subjects (35.71%, $N = 10$) felt that if a girl was fatter she would feel more feminine (i.e. “feel more like a girl”).

Clearly, amongst Black subjects there was generally a much smaller difference than in the White subjects between the extents to which particular positive characteristics were associated with a thin girl as opposed to with a fat girl. Evaluation of all above data on the extent to which various factors are associated with a thin girl and the extent to which various factors are associated with a fat girl, shows the following:

With regard to *self-esteem* (“feeling better about herself”), a large proportion of Black and White subjects attributed this characteristic to a thin girl and there was no major difference between the Black subjects’ score (66.88%) and White subjects score (83%) in this regard. Although the proportion of Black subjects who attributed self-esteem to a thin girl (66.88%) was large, the proportion attributing the characteristic to a fat girl was also large (56.69%). Furthermore, Black subjects were significantly more likely (56.69%) to associate “feeling better about herself” with a fat girl than were Whites (24.14%). White subjects were particularly likely to regard a thin girl as “feeling better about herself” (83.33%).

Black subjects were more likely (76.82%) than White subjects (58.62%) to regard a thin girl as *feeling more feminine* (“feeling more like a girl”). However, the Black subjects were also

more likely (62.66%) than the White subjects (35.71%) to regard a fat girl as feeling more feminine. The extent to which Black subjects linked greater femininity with a thin girl (76.82%) was not much greater than the extent to which they linked this characteristic with a fat girl (62.66%). However, amongst the White subjects, femininity was linked more with a thin girl (58.62%) than with a fat girl (35.71%).

With regard to *being prettier*, the Black ethnic group was significantly more likely (73.38%) than the White ethnic group (46.67%) to associate this characteristic with a girl who is thin. Also, the Black subjects were significantly more likely (57.32%) than were the White subjects (18.52%) to link the characteristic with a fat girl. The White subjects linked being pretty far more with a thin girl (46.67%) than with a fat girl (18.52%).

Black subjects were significantly more likely (68.75%) than White subjects (40.00%) to regard a thin girl as being likely to be *more popular* (“have more friends”). There was no statistical difference between the extent to which Black subjects (56.52%) and White subjects (40.74%) thought that a fat girl would be more popular. Whilst a large proportion of Black subjects (68.75%) associated being thin with popularity, the proportion associating being fat with popularity was also large (56.62%). Amongst Whites the proportion associating popularity with a thin girl (40.00%) was essentially no different to the proportion associating popularity with a fat girl (40.74%). Overall, whether a girl is thin or fat seems not to be regarded as being a major determinant of whether or not she will have more friends.

With regard to *being healthier*, no statistical difference was found between Black subjects and White subjects as to whether they associated health with a thin girl (65.16% of Black subjects and 74.19% of White subjects linked health with a thin girl). Similarly, there was no statistical difference between the proportion of Black subjects (50.00%) and the proportion of White subjects (32.14%) who linked health with a fat girl. Amongst Black subjects the proportion linking health with a thin girl was large (65.16%), but the proportion associating health with a fat girl was also large (50.00%). However, amongst Whites a far greater proportion associated health with a thin girl (74.19%) than with a fat girl (32.14%).

Relationship between BDS and subjects' answers relating to various attributes in association with a girl who is "fat"

In the three groups, there was no statistical significance regarding the link between the subjects' BDS and whether they thought that if a girl was fat, she would be more popular, feel better about herself, be more attractive, feel more feminine, or be healthier (Table 3.27).

Table 3.27: Subjects' perception of "fatness" by their Body Dissatisfaction Score (BDS)

	%, (N)	Mean BDS	p-value
<i>If a girl your age is fat she will have more friends</i>			
All (194) 10 subjects did not answer this question	54.12 (105)	- 0.37 (1.56)	0.80
Black (160) 6 subjects did not answer this question	56.52 (91)	- 0.37 (1.62)	0.95
White (27) 4 subjects did not answer this question	40.74 (11)	- 0.18 (1.17)	0.25
<i>If a girl your age is fat she will feel better about herself</i>			
All (193) 11 subjects did not answer this question	50.26 (97)	- 0.20 (1.71)	0.48
Black (157) 9 subjects did not answer this question	56.69 (89)	- 0.17 (1.72)	0.46
White (29) 2 subjects did not answer this question	24.14 (7)	- 0.29 (1.70)	0.98
<i>If a girl your age is fat she will be prettier</i>			
All (191) 13 subjects did not answer this question	50.26 (96)	- 0.35 (1.66)	0.90
Black (157) 9 subjects did not answer this question	57.32 (90)	- 0.37 (1.69)	0.48
White (27) 4 subjects did not answer this question	18.52 (5)	0.00 (1.22)	0.18
<i>If a girl your age is fat she will feel more like a girl</i>			
All (193) 11 subjects did not answer this question	58.03 (112)	-0.15 (1.49)	0.07
Black (158) 8 subjects did not answer this question	62.66 (99)	-0.13 (1.52)	0.17
White (28) 3 subjects did not answer this question	35.71 (10)	-0.30 (1.42)	0.42
<i>If a girl your age is fat she will be healthier</i>			
All (189) 15 subjects did not answer this question	47.09 (89)	-0.30 (1.71)	0.98
Black (154) 12 subjects did not answer this question	50.00 (77)	-0.33 (1.78)	0.55
White (28) 3 subjects did not answer this question	32.14 (9)	-0.22 (1.39)	0.38

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and whether the subject attributed certain characteristics to a girl being "fat"

There was no statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was fat that she would be more popular ($\chi^2 = 2.42$, $p = 0.12$), nor that she would be healthier ($\chi^2 = 3.10$, $p = 0.08$). There was a statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was fat that she would feel better about herself ($\chi^2 = 10.77$, $p < 0.01$). There was a statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was fat that she would be prettier ($\chi^2 = 14.74$, $p < 0.01$). There was a statistically significant difference between the ethnic groups with respect to whether the subjects thought that if a girl was fat that she would be more feminine ($\chi^2 = 7.02$, $p < 0.01$).

3.6.5.3 Subjects' perceptions of girls in the media

Question 5.3 required the subjects to answer whether they would like to look more like girls they had seen in the media (Table 3.28). There was a statistically significant difference between the ethnic groups with respect to whether the subjects wanted to look more like girls in the media ($\chi^2 = 6.38$, $p = 0.01$). Significantly more Black subjects than White subjects wanted to look like girls seen in the media. However, the majority of subjects in the group overall (84.24%, $N = 171$), in the Black ethnic group (87.27%, $N = 144$) and in the White ethnic group (67.74%, $N = 21$) respectively, felt that they wanted to look more like girls seen in the media. (Table 3.28)

Question 5.4 asked the subjects whether they would feel happier if they looked more like girls in the media. There was a statistically significant difference between the ethnic groups in this regard ($\chi^2 = 18.05$, $p < 0.01$). Although, in all groups more said that they would be happier if they looked more like girls seen in the media (Table 3.28), significantly more Black subjects than White subjects thought that they would be happier if they looked more like girls seen in the media. Subjects in the group overall 83.74% ($N = 170$), in the Black ethnic group 89.09% ($N = 147$) and in the White ethnic group 54.84% ($N = 17$), felt that they would be happier if they looked more like girls they had seen in the media. (Table 3.28)

Question 5.5 asked the subjects whether they discuss girls they had seen in the media with their friends. There was no statistically significant difference between the ethnic groups with respect to whether the subjects discuss girls they had seen in the media with their friends ($\chi^2 = 2.03$, $p = 0.15$). The majority of subjects in the group overall (73.89%, $N = 150$), the Black subjects (76.97%, $N = 127$) and the White subjects (64.52%, $N = 20$) respectively, discussed girls in the media with their friends. (Table 3.28)

There was no statistically significant relationship (using the Mann-Whitney test) found in the group overall, Black ethnic group or White ethnic group between the subjects' BDS and any of the following: whether they wished to look more like girls in the media ($p = 0.20$, 0.21 , 0.43 respectively), whether they thought that they would be happier if they looked more like girls in the media ($p = 0.48$, 0.17 , 0.89 respectively), whether they discussed girls they saw in the media ($p = 0.39$, 0.44 , 0.82 respectively).

Table 3.28: Effects of media influence on subjects' Body Dissatisfaction Score (BDS)

Ethnicity (N)	%, (N)	Mean BDS (SD)	p-value
<i>Would you want to look more like girls seen in the media?</i>			
All (203)*	84.24 (171)	- 0.33 (1.78)	0.20
Black (165)*	87.27 (144)	- 0.27 (1.84)	0.21
White (31)	67.74 (21)	- 0.71 (1.45)	0.43
<i>Would you be happier if you looked more like girls in the media?</i>			
All (203)*	83.74 (170)	- 0.33 (1.70)	0.48
Black (165)*	89.09 (147)	- 0.29 (1.74)	0.17
White (31)	54.84 (17)	- 0.59 (1.58)	0.89
<i>Do you and your friends discuss girls seen in the media?</i>			
All (203)*	73.89 (150)	- 0.21 (1.70)	0.39
Black (165)*	76.97 (127)	- 0.15 (1.77)	0.44
White (31)	64.52 (20)	- 0.50 (1.19)	0.82

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and their attitudes towards girls seen in the media

*1 subject did not answer this question

There was a statistically significant difference between the ethnic groups with respect to whether the subjects wanted to look more like girls in the media ($\chi^2 = 6.38$, $p = 0.01$). There was a statistically significant difference between the ethnic groups with respect to whether the subjects felt they would be happier if they looked more like girls in the media ($\chi^2 = 18.05$, $p < 0.01$). There was no statistically significant difference between the ethnic groups with respect to whether the subjects discuss girls seen in the media with their friends ($\chi^2 = 2.03$, $p = 0.15$).

In summary for Section 3.6.5, there appeared to be definite cultural and media influences which governed the subjects' body satisfaction. With respect to the cultural influences, within the White ethnic group a thin girl was unequivocally associated with good self-esteem ("feeling better about herself") and being healthier. The White subjects were also more likely to link femininity and prettiness with a thin girl rather than with a fat girl. However, whether a girl is thin or fat seems not to be a major determinant of popularity within the White ethnic group. Within the Black ethnic group there was generally a much smaller difference than in the White ethnic group between the extents to which particular positive characteristics were attributed to a thin girl as opposed to fat girl. In the Black ethnic group, a large proportion attributed self-esteem, femininity, prettiness, popularity and health to a thin girl. However, the proportion of Black subjects that attributed these characteristics to a fat girl was also large,

even if not quite as large overall. By contrast, the White subjects were clearly less inclined to attribute these positive characteristics to a girl of their age who was fat.

With respect to media influences, the majority of subjects in the group overall, in the Black ethnic group and in the White ethnic group tended to want to look like girls they had seen in the media, felt that they would be happier if they looked more like those girls and discussed those girls with their friends. However, the Black subjects were significantly more likely to want to look like girls they had seen in the media and to feel that they would be happier if they looked like those girls. No significant relationship was found between these parameters of media influence and BDS.

3.6.6 Physical activity level (PAL)

3.6.6.1 Subjects' BDS and PAL

The subjects were required to answer how many times a week they exercised and in this way the physical activity level (PAL) could be calculated (Table 3.29). A large proportion of the subjects appeared to exhibit a high PAL and this applied in the group overall (64.71%, $N = 132$), amongst the Black subjects (59.04%, $N = 98$) and amongst the White subjects (90.32%, $N = 28$). The Kruskal-Wallis test showed no statistically significant relationship between the subjects' PAL and their BDS in the group overall ($p = 0.36$), amongst the Black subjects ($p = 0.49$) or amongst the White subjects ($p = 0.44$).

Table 3.29: Level of physical activity by Body Dissatisfaction Score (BDS)

Ethnicity (N)	Level of physical activity %, (N)			p-value
	Low (partake in formal or informal physical activity < 3 times per week and/or participate regularly in sedentary activities)	Medium (partake in formal and/or informal physical activity 3 to 4 times a week)	High (partake in formal and/or informal physical activity > 4 times per week)	
Group overall (204)	15.69 (32) Mean BDS: + 0.09 (0.30)	19.61 (40) Mean BDS: - 0.50 (0.27)	64.71 (132) Mean BDS: - 0.33 (0.15)	0.36
Black (166)	19.28 (32) Mean BDS: + 0.09 (0.31)	21.69 (36) Mean BDS: - 0.44 (0.30)	59.04 (98) Mean BDS: - 0.26 (0.18)	0.49
White (31)	0.00 (0)	9.68 (3) Mean BDS: - 1.00 (0.75)	90.32 (28) Mean BDS: - 0.57 (0.25)	0.44

Significance level: $p < 0.05$

p-value refers to the significance of the relationship between the subjects' BDS and their level of physical activity

3.6.6.2 Subjects' BDS and type of physical activity participated in

The type of physical activity the subjects participate in can be differentiated into aesthetic sports and non-aesthetic sports. The aesthetic sports are those which require the participant to have a slim physique and include dancing, gymnastics and – to an extent – swimming. There was a statistically significant difference between the ethnic groups with respect to whether they participated in aesthetic sports ($\chi^2 = 7.36$, $p = 0.01$) and it was found that significantly more White subjects than Black subjects participated in aesthetic sports. A large proportion of subjects who took part in swimming (52.29%, $N = 57$), dancing (52.94%, $N = 36$) and gymnastics (31.58%, $N = 6$) had a negative BDS and therefore would like to be thinner. There was no statistically significant difference between the ethnic groups with respect to whether the subjects participated in non-aesthetic sports ($\chi^2 = 0.08$, $p = 0.77$).

The Mann-Whitney test showed that no statistically significant relationship was found between those subjects that participated in aesthetic sports and their BDS in the group overall

($p = 0.93$), amongst the Black subjects ($p = 0.90$) nor amongst the White subjects ($p = 0.13$). Similarly, the Mann-Whitney test showed no statistically significant relationship between those subjects that participated in non-aesthetic sports and their BDS in the group overall ($p = 0.77$), in the Black ethnic group ($p = 0.69$) or in the White ethnic group ($p = 0.88$).

Also, after statistical analysis, no significant relationship was found between the subjects' BDS and the frequency with which they participated in aesthetic sports (Spearman $r = 0.01$, $p = 0.90$) or non-aesthetic sports and BDS (Spearman $r = 0.00$, $p = 0.99$) in the group overall.

In the Black ethnic group, there was no statistically significant relationship between the subjects' BDS and their frequency of participation in aesthetic sports (Spearman $r = 0.00$, $p = 0.98$), nor was there a statistically significant relationship between the subjects' BDS and the frequency with which they participated in non-aesthetic sports (Spearman $r = -0.01$, $p = 0.92$). Also, in the White ethnic group, there was no statistically significant relationship between the subjects' BDS and their frequency of participation in aesthetic sports (Spearman $r = 0.18$, $p = 0.33$) or non-aesthetic sports (Spearman $r = 0.10$, $p = 0.59$).

These results therefore show that there was no significant relationship between the subjects' level of physical activity and their BDS, nor was there a statistically significant relationship between the type of sports the subjects took part in and their BDS.

CHAPTER 4: DISCUSSION

4.1 MAIN FINDINGS OF THE STUDY

Several significant findings of this study are novel and therefore appear to be a valuable addition to the body of research that exists in this field.

A large proportion, half of the sample (50%), had a negative BDS and thus wanted to be thinner and similarly, about half (51%) of the sample had been involved in weight control behaviours. This proportion for subjects wanting to lose weight was larger than had been reported in other similar studies,^{31, 73} but the proportion was comparable to that reported by others.^{12, 23} In addition, there was a higher proportion of subjects wanting to lose weight and/or involved in weight control behaviours than was found in similar studies.^{12, 23, 31, 73} Over a quarter of the subjects had a positive BDS and thus wanted to be heavier. Over a tenth of the subjects exhibited severe body dissatisfaction with a BDS of -3 or below, or +3 or above. No link was found between socioeconomic status and BDS, unlike what was found in other studies where body image perception and socioeconomic status were investigated.^{5, 17-18}

A significant difference was found between the silhouette subjects *wanted to look like* and the silhouette that they thought their family wanted them to look like. In the case of the group overall and the Black ethnic group, the subjects tended to think that their family wanted them to look like a larger silhouette than they wanted to look like themselves. In the case of the White ethnic group, the subjects tended to think that their family wanted them to be thinner than the silhouette they wanted to look like themselves.

A significant difference was also found in the group overall between the silhouette that the subjects thought *looked most like themselves* and the silhouette that the subjects thought their family wanted them to look like. In the group overall, the subjects thought that their family wanted them to look like a larger silhouette than the one they thought they looked like themselves. A significant difference was also found in the White subjects in this same regard. However, in the White ethnic group, the subjects felt that their family would want them to be closer in size to a silhouette thinner than the one the subjects likened themselves to. No significant difference was found in this regard in the Black subjects.

In the group overall and amongst the Black subjects, a significant negative correlation was found between BDS and whether the subjects had been told by a family member that they were thin or fat respectively. Those subjects that had been told by a family member that they were thin had a more positive BDS than those that had not been told by a family member that they were thin. Conversely, those that had been told by a family member that they were fat, had a more negative BDS than those that had not been told by a family member that they were fat. It is, therefore, clear that family has an impact on the children's body satisfaction, as well as on their desire to alter their weight and body image perception. Also of interest is that an overweight grandparent appeared to significantly affect subjects' BDS.

In the group overall and amongst the Black subjects, a significant correlation was found between the subjects' BDS and whether the subjects had been told by a peer that they are fat. It appears that in the group overall and in the Black ethnic group, the comments of both their family and peers significantly affected their own body image perception. No statistically significant correlation in this regard was found in the White subjects.

There was no significant link between the type or frequency of physical activity and BDS. This was in contrast to what was reported in a similar research study.⁹

4.2 BODY IMAGE PERCEPTION AND BODY SHAPE SATISFACTION

Half of the subjects (50%) that took part in the study had a negative BDS, which means that they wanted to be thinner to varying degrees. Only 21% of the subjects were satisfied with their body shape and did not want to be either thinner or fatter, whereas 28% of the subjects had a positive BDS implying that they wanted to be heavier. This study reflected a larger percentage of subjects as wanting to be thinner than did similar studies in the United States by McVey *et al*³¹ and Maloney *et al*⁷³ who found that 26% and 45% of the subjects respectively wanted to be thinner. The result in this study (i.e. 50% wanting to be thinner) was however very similar to that found in the United States-based study by Schur *et al*²³ and the Australian-based study by Rolland *et al* (1997),¹² who both reported that approximately 50% of the subjects wanted to be thinner.

In the sample as a whole and across the ethnic groups, the majority of the subjects felt that their weight was "just right." However, in the group as a whole and amongst the Black

subjects, there was a statistically significant relationship found between the way the subjects perceived themselves and their BDS. In other words, those that felt they were “thin” had a positive BDS and thus wanted to gain weight, those who felt that they were “just right” had a BDS close to zero and thus were happy with their weight, and those that thought they were “fat” had a negative BDS and thus wanted to lose weight. Similarly, there was a statistically significant relationship in the group overall between BDS and the subjects’ weight satisfaction, in that those subjects that who were “very happy” with their weight had a BDS close to zero and thus wanted to neither gain nor lose weight, whereas those subjects that were “very unhappy” with their weight had a more negative BDS and thus wanted to be thinner.

It is surprising that the majority of the subjects in the group overall felt that their weight was “just right” and they were “very happy” with their weight, yet a large proportion of the subjects’ BDS showed that they wanted to be thinner. This may be explained as a difference of the subjects’ perception of weight versus body shape. Although they may have felt that their weight was fine, the subjects may still wish to have a thinner body shape and do not necessarily see weight and body shape as intrinsically related. Alternatively, the subjects may have misunderstood the question. There was no statistically significant relationship found between the White subjects’ BDS and the classification of their weight.

In the group as a whole and within the Black ethnic group, there was no statistically significant relationship between the subjects’ concern about being fat and their BDS. The statistically significant relationship in the case of the White subjects in this regard means that those girls who worry about being fat had a negative mean BDS and therefore want to be thinner. A significantly higher percentage of Black subjects (92%) than White subjects (77%) were happy with their weight. This is similar to comparable data from other studies that have found higher weight concerns in White girls.^{16, 90} This could suggest that in this study weight is more of a concern within the White than the Black ethnic group and that worrying about being fat underlies the White subjects’ drive to be thinner.

The study shows that amongst the Black subjects a higher proportion felt “just right” than was the case amongst the White subjects. Also, a higher percentage of White subjects than Black subjects thought that they were fat. This indication that the Black subjects were generally happier with their weight than the White subjects, is in keeping with the findings discussed thus far.

In keeping with the general findings, the majority of the group overall and of the Black subjects claimed that they do not worry about being fat, whereas the majority of White subjects claimed that they do. Therefore there was more emphasis placed on thinness in the case of the White subjects. This is most likely to be attributable to differences in cultural perceptions of and “ideals” relating to thinness. The results in this regard are similar to those in Caradas *et al*, where it was found that White girls felt that a thinner body shape was more ideal, than did the Black girls.¹⁶

Twelve percent of the subjects in the group overall had a BDS showing that they were severely dissatisfied with their bodies. They either wanted to be dramatically thinner (BDS of -3 to -7) or dramatically fatter (BDS of +3 to +7). As mentioned previously, it is essential that body image disorders are addressed. Body image intervention programmes need to be put in place. These are especially important for the girls identified with severe body dissatisfaction, since these girls are likely to be at high risk of more severe body image disorders. Examples of such disorders are eating disorders and these – without appropriate intervention - can have serious health repercussions and can even be fatal.

4.3 GENERAL PERCEPTION OF BODY SIZE AND SHAPE

When asked which girl was the thinnest girl of those shown in the Silhouette Perception Scale (Figure 2.2), the majority chose *Silhouette A* (BMI category 1 – underweight). However, there were also some subjects across both ethnic groups that chose *Silhouette B* (BMI category 2 – at risk of underweight), *C* (BMI category 2 – at risk of underweight), *D* (BMI category 3 – at a healthy weight) or *E* (BMI category 3 – at a healthy weight) as being thin. This suggests that the subjects that chose silhouettes other than *Silhouette A* (BMI category 1 – underweight) for this answer placed more of an emotional relevance on the word “thin” and rather than seeing the word “thin” as simply the antonym of “fat,” they saw it as desirable and therefore may have chosen the silhouette that was not literally the thinnest but perhaps to them was the most desirable.

Similarly results were found to the silhouette associated with being “fat”. The majority of the subjects in all 3 groups chose *Silhouette H* (BMI category 5 – overweight) for this answer. However, in the group overall subjects that selected *Silhouette G* (BMI category 4 – at risk of

overweight) to be “fat,” had a mean positive BDS. This means that these subjects wanted to be bigger and could suggest that for these subjects the word “fat” has positive connotations. For example, these subjects may have felt that the word “fat” was associated with wealth and beauty as was found in the study by Puoane *et al* (2005).⁶⁴ These subjects would, therefore, want to be more overweight themselves.

The majority of Black subjects considered *Silhouette E* (BMI category 3 – at a healthy weight) to indicate someone of “normal” weight, whereas White subjects focused more on *Silhouette D* (BMI category 3 – at a healthy weight) in this regard. Clearly, a more overweight body size was more acceptable to the Black subjects than to the White subjects. Similarly, when asked which silhouette they themselves most looked like (Question 2.3), the majority of the Black subjects chose *Silhouette E* (BMI category 3 – at a healthy weight), whereas the majority of the White subjects chose *Silhouette D* (BMI category 3 – at a healthy weight). This therefore suggests that the White subjects not only perceive a thinner body size as the norm, but also perceive themselves as thinner than the Black subjects perceive themselves. However, as evidenced by the subjects’ anthropometric status, there was no statistically significant difference between the ethnic groups with respect to the subjects’ BMI. These results are therefore similar to the results of Saxton *et al* (2009)⁸⁹ where it was found that children tend to underestimate their body size.

The extent to which subjects associated each silhouette with various attributes (e.g. most attractive, most popular, unhappiest, etc) indicated the subjects’ attitudes towards body shape and size. The majority of positive attributes were ascribed to thinner silhouettes and the majority of negative attributes were ascribed to more overweight silhouettes. For example, the majority of the subjects in both the Black and White ethnic groups thought that the largest silhouette (*Silhouette H*) would be the unhappiest. Although this was the opinion of both ethnic groups, a higher proportion of White subjects had this opinion. This was a similar result to that in Mciza *et al* (2005)⁵, where it was found that a higher proportion of White than Black girls thought that a fat girl would be unhappy.

It is interesting to note that that subjects who chose a thinner silhouette as looking the best were significantly more likely to have a negative BDS, thus wanting to be thinner themselves. Correspondingly, those subjects who chose a larger silhouette as looking the best were significantly more likely to have a positive BDS, thus wanting to be larger themselves.

Similarly, subjects with a negative BDS were significantly more likely to choose a thinner silhouette as being the happiest and a larger one as being the unhappiest. The opposite was seen in those subjects with a positive BDS who thought that a larger silhouette would be happiest and a thinner silhouette would be unhappiest. These results indicate the direct relationship between the subjects' BDS – and thus their degree of body satisfaction – and the way they feel about their own bodies in terms of the positive and negative characteristics they feel are implied by their particular body shape/size.

The one positive attribute that was ascribed to being more overweight in the group overall and amongst the Black subjects was strength. The majority chose the largest silhouette, *Silhouette H* (BMI category 5 – overweight), as being the strongest. This is similar to the results in Puoane *et al* where it was found that being more overweight was perceived by Black girls as making one stronger.⁹⁰ The majority of White subjects chose *Silhouette B* (BMI category 2 – at risk of underweight) or *Silhouette E* (BMI category 3 – at a healthy weight) as being the strongest. This suggests that the White subjects do not necessarily associate strength with simply being larger in size, but rather with being leaner and fitter.

4.4 SUBJECTS' BODY IMAGE PERCEPTION IN RELATION TO THEIR ACTUAL ANTHROPOMETRIC STATUS

Almost half of the subjects (45%) in the group overall were able to correctly identify their body shape and size when choosing the silhouette that looked most like them and therefore did not have a distorted perception of their body size. This was evidenced by the significant correlation between the subjects' BMI and the corresponding silhouette that they chose as looking most like them. These results mirror those in Mciza *et al* (2005)⁵ who found a significant positive correlation between the subjects' anthropometric data and the silhouette they chose as looking most like themselves. However, over half (55%) of the group overall saw themselves as thinner or larger than they actually were and thus perceived a distorted image of themselves. In addition, there was a statistically significant relationship between BDS and the BMI category that the subjects were classified as. Those subjects that were classified as “underweight” (BMI category 1) or “at risk of underweight” (BMI category 2) were statistically more likely to have a mean positive BDS and thus want to gain weight; those subjects that were classified as “overweight” (BMI category 5) or “at risk of overweight” (BMI category 4) were statistically more likely to have a mean negative BDS

and thus want to lose weight; and those subjects that were classified as being “at a healthy weight” (BMI category 3) were statistically more likely to have a BDS close to zero and thus were satisfied with their weight and neither wanted to lose or gain weight.

The subjects’ high degree of misperception of their true body shape coupled with their generalized body dissatisfaction (as evidenced by BDS) indicates, once again, that body image programmes are necessary in this age group. Such programmes should be geared to ensure that should girls in this age group start developing body size or body image concerns, they can be prevented from developing severe body dissatisfaction and thus from this progressing to a full-blown eating disorder.

Although it is good to know that a large sector of subjects do see themselves as they actually are, this is small comfort when considering the relatively high degree of body dissatisfaction that emerged in the study as a whole as these subjects are not only likely to have poorer self esteem, but also are at increased risk of eating disorders.

What does need to be taken into account is that the subjects were weighed with some clothing on (i.e. they were asked to remove jerseys and shoes, but did have on their basic school uniforms consisting of a skirt, cotton shirt, socks and underwear). This was instituted to maintain the modesty of the subjects, thus preventing them from feeling uncomfortable or embarrassed by having to strip down to underwear. The additional layer of clothing may have therefore added slightly to the weight measured, but the amount of clothing was standardized since all were dressed the same upon weighing.

In both the overall sample and amongst the Black subjects respectively, the subjects chose *Silhouette E* (BMI category 3 – at a healthy weight) most often as looking most like them, but wanted to be thinner i.e. look more like *Silhouette D* (BMI category 3 – at a healthy weight). It is interesting to note that even though the majority of the Black subjects saw *Silhouette E* (BMI category 3 – at a healthy weight) as the one showing someone of normal weight, 15% of the Black subjects actually wanted to be bigger than that silhouette.

On the other hand, the White girls chose *Silhouette D* (BMI category 3 – at a healthy weight) most often as looking most like them, but wanted to look like *Silhouette C* (BMI category 2 – at risk of underweight). This was another indication of the White girls ideally wanting to be

thinner than the Black girls did. A large proportion of the White subjects, wanted to be like *Silhouette B* (BMI category 2 – at risk of underweight) or *C* (BMI category 2 – at risk of underweight) and almost a quarter of the subjects (23%) wanted to be as thin as *Silhouette A* (BMI category 1 – underweight) and none of the White subjects wanted to be more larger than *Silhouette E* (BMI category 3 – at a healthy weight). This indicates ethnic differences in body ideals and norms. These differences were likely to be linked to cultural differences and were comparable to those found in similar studies.^{16, 90} The implications of this were that, in each of the ethnic groups, there was an increased risk of body dissatisfaction amongst 8 or 9 year old girls based on these girls' attempt to fulfill the body ideals which their ethnic group ascribes to.

4.5 EFFECT OF VARIOUS FACTORS ON BODY IMAGE PERCEPTION

4.5.1 Socioeconomic status

A large number of people living under the same roof, as well as multiple children, are indicators of a poorer SES.⁷⁵⁻⁷⁷ Based on this, the Black children were of a lower SES than the White children because of the higher average number of people living in the household, as well as their higher number of siblings. Although no statistically significant correlation was found between BDS and the SES markers (i.e. household size and number of siblings), it is important to note that this question was not particularly well-answered by the subjects. There is a chance that with better answering of the question, more of a statistically significant correlation may have been found in this respect. Similar studies done in the international context have shown varying results in this regard.¹⁷⁻¹⁸ In the South African context, it has however been found that girls of a lower SES are likely to have a better body image and body satisfaction in comparison with girls of a higher SES.⁵ This is also what could have been expected to occur in this study, but it did not. It must also be pointed out that the White subjects had a mean number of two siblings and a mean number of five people living in the house, which most likely includes the subjects' parents, the two siblings and the subjects herself. The Black children however had a mean number of four siblings and five people living in the house. This could mean that not all the Black subjects' siblings live at home, which then allows for the total of five people living in the house to include at least one caregiver. However, the question with regards to number of people living in the house was not

well-answered and the number of siblings the subjects had appears to have been a better indication of SES as has been found in other studies.⁷⁵⁻⁷⁷

4.5.2 Family's weight control behaviours and attitudes towards eating and weight

Overall, a large proportion of the subjects in the group overall and the Black subjects felt that their family would want them to look like *Silhouette D* or *E* (i.e. the two healthy weight silhouettes), which was consistent or slightly larger than the silhouette the subjects most wanted to look like themselves. However, the majority of White subjects chose slightly larger silhouettes as being the one that their family would want them to look like i.e. *Silhouettes B* (BMI category 2 – at risk of underweight), *C* (BMI category 2 – at risk of underweight) or *D* (BMI category 3 – at a healthy weight) than the silhouettes they chose as looking most like themselves.

Furthermore, in the group overall and amongst Black subjects, there was a statistically significant relationship between the subjects' BDS and the silhouette which the subjects thought that their families would want them to look like (Table 3.12). Those girls that wanted to be thinner (i.e. had a negative BDS) or fatter (i.e. had a positive BDS) felt that their family wanted them to be thinner or fatter respectively. In keeping with this trend, those girls that were happy with their weight - and thus had a BDS of zero - felt that their families were happy with their weight. Amongst White subjects, there was no statistically significant relationship between the White subjects' BDS and what they chose as their family's choices of silhouette as looking most like themselves. This can be interpreted to mean that the White subjects are aware of what their family would want them to look like, but their own body image perception or body shape ideals does not necessarily correlate with this. As discussed, they would like to be thinner than what they thought their families would like them to be.

A further indication of the role played by family was evident for the group overall and the Black subjects in that a statistically significant relationship was found amongst those subjects that had been told by their family that they were thin and their BDS; as well as those subjects that had been told by their family that they were fat and their BDS. Clearly, subjects in the overall sample and the Black ethnic group place a lot of emphasis on family opinions. If their family had told them that they were thin, they wanted to gain weight (i.e. they had a positive BDS) and if their family had told them that they were fat, they wanted to lose weight (i.e. they

had a negative BDS). However, the White subjects undoubtedly have a different reaction to their family's comments or lack thereof. It is interesting to note that in the White ethnic group, regardless of whether or not family members had commented on them being thin or fat, they wanted to lose weight anyway. This was indicated by their mean BDS being negative. This could be due to various factors. For example, parents who did comment on subjects' weight may have created greater awareness of the subjects' weight and body thus potentially increasing body dissatisfaction. These results are similar to those of Rodgers *et al* who found that comments from parents – both positive and negative in nature – have an effect on children's body satisfaction.⁹¹ However, other factors could also play a part e.g. cultural differences are likely to play a part as indicated by the differences between the ethnic groups as regards the attributes they associate with different silhouette sizes.

In the group overall and within the ethnic groups there was a lack of statistical significance with respect to correlation between BDS and any of the family members attempting to lose weight. This is surprising and contrary to what emerged in some other studies²² where it was emphasized that children model their weight loss attempts on the behaviour of their family and especially of their parents. This author also particularly expected that the high proportion of subjects' mothers in both ethnic groups who were overweight and had tried to lose weight, would've affected the subjects' BDS as has been found in other studies.^{5, 22, 25, 26}

The lack of correlation in this study between the subjects' BDS and their mothers' weight and weight control behaviours was, however, similar to that in Ogden and Steward (2000)²⁴ where no statistically significant correlation was found between weight concerns of daughters and those of their mothers. Ogden did find other aspects which appeared to affect the daughters' body satisfaction (i.e. the mothers' belief in their own and her daughters' autonomy), which were not tested in this study. Further investigation of the relationship of 8 and 9 year old girls (and of young girls generally) with their family, in terms of weight-related issues, would be a worthwhile and informative avenue for future research.

What did emerge, amongst the Black subjects and in the group as a whole, was a statistically significant relationship between the subjects' BDS and whether or not they have a grandparent who is fat. Those with an overweight grandparent had a significantly lower BDS and therefore wanted to lose weight. This could be attributed to the importance that is placed

on the elderly in many cultures, and perhaps the grandparent is the family member encouraging their weight control. However, this too requires further investigation.

4.5.3 Weight control behaviours

In both the overall group and amongst the Black subjects, there was a statistically significant relationship between BDS and exercising less as a means of gaining weight. Those subjects that had tried to gain weight by exercising less were also more likely to have a negative BDS. This is counterintuitive as one would expect those subjects that had tried to gain weight through exercising less to have a positive, rather than negative, BDS. This finding can perhaps be explained by considering that Question 4.4 of the questionnaire relates to whether the subject had ever tried to gain weight and not necessarily if they are trying to gain weight now. Therefore, although these subjects - at the time of the study - may have wanted be thinner, they could have gone through a period where they had tried to gain weight. This could perhaps suggest general body dissatisfaction problems in that they are never happy with their bodies.

In the group overall, about half (51%) had been involved in weight control behaviours in an attempt to lose weight. This was a higher percentage than found in Maloney *et al*⁷³, Schur *et al*²³ or Rolland *et al*,¹² where 37%, 16% and 40% of the subjects in these studies respectively had tried to lose weight in the past.

This study found that subjects in the group overall had tried to lose weight by eating less (43%), skipping meals (18%), not eating the whole day (16%) and/or exercising more (45%). The proportion of subjects who had tried to lose weight by eating less, fasting and exercising was higher than was found by Carter *et al* (2001)⁵⁵ who reported that 24% of subjects reduced their food intake to lose weight, 5% fasted for at least 8 hours to lose weight and 38% had recently exercised hard to lose weight. The higher percentages of weight control behaviours found in this study in comparison with what was found in the Carter *et al* study, could indicate a higher degree of body dissatisfaction being present in this study sample than in the Carter *et al* sample. However, it could also be indicative of food insecurity which is highly prevalent in our South African milieu.⁹² In other words, some of the subjects of a lower socio-economic status may have confused questions about skipping meals or fasting to lose

weight, with having to skip meals due to poor household food security, lack of food availability, which would thus result in unintentional weight loss.

Overall, the majority of subjects answered that they think about getting thinner during exercise. However, a higher proportion of White subjects think about getting thinner during exercise than is the case amongst Black subjects. In both the group overall and amongst the Black subjects, the statistically significant relationship between BDS and thinking about getting thinner during exercise, suggests that exercise is very often used as a means of weight loss.

Irrespective of whether they were trying to lose weight or not subjects indicated whether or not they try to avoid sugary foods. It emerged that Black children of the age group covered in this study were more likely to claim that they avoid sugary foods than were their White counterparts. This could potentially be due to cultural differences in the use of sugar and in sugar consumption. Research has shown a lower added sugar intake amongst Black children than amongst White children, whereas Black adults exhibit higher sugar consumption than do White adults.⁹³⁻⁹⁵ Those results, coupled with findings in this study, could suggest that although the Black subjects in this study showed a propensity for avoiding sugar, their sugar intake may increase with age. However, one cannot conclude from these results that the avoidance of sugar by the Black subjects is for the purposes of weight loss.

The high prevalence amongst White subjects of eating diet foods and the lower prevalence of this practice amongst the Black subjects could possibly be attributed to cultural and/or socioeconomic differences (diet foods are usually more expensive). There is also a higher prevalence of starch-avoidance in the White ethnic group than in the Black ethnic group. This can also possibly be attributed to cultural differences and socioeconomic considerations (starch is generally cheaper than animal protein and therefore more likely to be eaten more frequently in the lower socioeconomic echelons).

The statistically significant relationship in the group overall between BDS and feeling guilty after eating sweets, shows that those that feel guilty when eating sweets are also more likely to want to be thinner (i.e. have a negative BDS). This is a logical result in that one would expect that those who feel that they need to lose weight would be aware of the calorific nature of sweets. They would therefore be more likely to feel guilty when they eat sweets. A higher

percentage of Black subjects than White subjects felt guilty after eating sweets. This, once again, highlights the differences in sugar consumption between the Black and White subjects.

4.5.4 Peer influences

The subjects' choice of the silhouette which they consider to be ideal versus the silhouette they feel their peers would want them to look like, did not appear to be significantly affected by their BDS. However, there was a tendency for subjects in the group overall and the Black subjects to feel that overall their peers would want them to be thinner for those subjects that saw themselves as *Silhouette F* (BMI category 4 – at risk of overweight) or larger. In the case of the White subjects, they generally felt that their peers would want them to be larger than they wanted for themselves. In addition, in the group overall and amongst the Black subjects, there was a statistically significant relationship between BDS and whether the subject had been told by a peer that they were fat. This can be interpreted as those subjects in the group overall and the Black ethnic group who had been told by a peer that they were fat were significantly more likely to have a negative BDS and thus want to lose weight. There was no statistically significant relationship between BDS and whether the subject had been told by a peer that they were fat in the case of the White ethnic group. It can therefore be postulated that the body image perception of subjects in the group overall and the Black subjects was greatly affected by their peers' opinion of their weight, and these subjects valued their peers' opinion to a greater extent than did the White subjects.

A higher proportion of subjects in the White ethnic group than in the Black ethnic group claimed to have had a friend who had tried to lose weight. Therefore, despite the Black subjects having had a higher regard than did the White subjects for peers' opinion of their weight, the White subjects nevertheless had a higher proportion of peers involved in weight control behaviours.

Therefore, it seems that the Black subjects appeared to feel more pressure from their peers to lose weight, than did the White subjects.

4.5.5 Societal (media and cultural) influences

Both ethnic groups ascribed a range of positive character traits to someone who is thin. These included having a better self-esteem, being more feminine, being prettier and being healthier. Although it is clear that in both ethnic groups being thin is more likely to be associated with positive attributes than is being fat, being fat does have some positive connotations amongst the Black subjects. Restated from a cultural perspective, being thin has a positive connotation in both cultures, but being fat would seem to have some positive connotations in the Black culture. The greater acceptability of “fatness” amongst the Black ethnic group is in keeping with the results of the study by Puoane *et al* which found that fatness was more socially acceptable and in some cases more desirable than thinness in the Black ethnic group.⁶⁴ There is thus a difference between the Black and White ethnic groups as to their cultural perceptions relating to being fat.

It is interesting to note that in the White ethnic group there was a statistically significant relationship between the subjects’ BDS and whether a girl their age would feel better about herself if she was thin. This would appear to show that one of the reasons the White subjects may wish to be thinner is to feel better about themselves, thus indicating a definite need for improvement in self esteem to prevent the subjects’ self-worth being based primarily on their body shape or size.

It also bears mention with regard to this section that the question required the subjects to ascribe various attributes to the silhouettes, whereas usually the subjects may not necessarily think about these attributes in relation to body size or shape.

There was a clear desire amongst the subjects in both ethnic groups to want to look more like girls they had seen in the media. In addition the majority thought that they would be happier if they looked more like girls they had seen in the media. Also, the majority of the subjects in the group overall (74%) of the subjects discuss girls seen in the media with their peers. This indicates that there is also peer influence involved in the subjects’ perception of girls shown in the media. This result was similar to results in Field *et al* (1999)³⁷ who found that 69% of subjects felt that the media influenced their concept of body shape ideals and 47% said that they wanted to lose weight as a result of pictures they had seen in magazines.

4.5.6 Physical activity level (PAL) and aesthetic sports

Davison *et al* (2002)⁹ found a tendency for girls who regularly took part in aesthetic sports to want to be thinner. This could be due to the focus of these activities/sports on appearance. There could be resultant pressure for the girls to maintain a certain body shape for the activity or sport as such and/or for the wearing of form-fitting clothing when taking part in these activities/sports.

There were 3 aesthetic sports addressed in this study: swimming, dancing and gymnastics. A large proportion of subjects who took part in swimming (52%) and dancing (53%) were found to have a negative BDS, indicating that they would like to be thinner. Amongst those who took part in gymnastics, a lower proportion (32%) had a negative BDS. There was however an absence of a significant link between the subjects' BDS and their physical activity type and level. These results were therefore not in keeping with the findings of Davison *et al.*⁹

The results of the study reported here should be interpreted with caution since this section was generally not well-answered. Many of the subjects either overestimated the amount of exercise they did and/or the amount of sedentary activities they took part in. As a result, there may have been the possibility of a significant link between BDS and physical activity type and level had this section of the questionnaire been answered better.

**CHAPTER 5: CONCLUSIONS, LIMITATIONS OF THE STUDY AND
RECOMMENDATIONS**

5.1 CONCLUSION

Several novel findings resulted from this study. These suggest that a negative body image and/or disordered eating habits are relatively common in Grade 3 females in Northeastern Johannesburg. The most important finding is the high degree of body dissatisfaction and the high level of participation in weight control behaviours found in both the Black and White subjects. This indicates a definite need for body image programmes to be implemented at the primary school level. These should educate children on how to feel good about their bodies thus preventing the body image disturbances that may manifest later in life as eating disorders or disordered eating behaviours. In addition, good nutrition education is essential to enable children to make informed healthy food choices and to help the children to understand the importance of good nutrition and its role in health. In this way, children can grow up eating a balanced, healthy diet. This should, hopefully, limit weight problems and thus the need for extreme weight control behaviours.

One of the main findings in this study was that family was found to play a prominent role in subjects' body satisfaction and body image perception, with Black subjects generally having felt that their family would want them to be larger than they are or than they want to be, whereas the White subjects generally felt that their family would want them to be thinner in this regard. It was also found that comments on their weight from subjects' families had a strong influence on their extent of body satisfaction and on their desire to lose or gain weight. This indicates that it is vital that families of girls of this age should be made aware of the importance of promoting healthy body shape ideals and these families should be encouraged to be conscious of comments they make about the weight of their daughters.

Peer influences appeared to be of more relevance in the Black ethnic group, with peers' comments on the subjects' weight significantly affecting the subjects' body satisfaction. Body image programmes implemented at the school level amongst all girls in the relevant age group would encourage general body satisfaction, help girls with weight-related problems (or potential problems) and reduce negative body- and weight-related comments from the girls' peers.

Both cultural and media influences were found to be relevant in both the Black and White ethnic groups. "Thinness" was valued in both ethnic groups, but "fatness" was also valued to

some extent in the Black ethnic group. In addition, the majority of subjects expressed a desire to look like girls seen in the media and thought that their lives would be improved if they looked like those girls. Clearly, awareness needs to be created at media level as to the potential negative effect media messages can have on the body image of girls of this age. The media could be used as a vehicle to convey positive body- and weight-related messages. Such messages, if positioned in appropriate media, could have the additional benefit of helping to promote healthy body shape ideals at the cultural level.

5.2 RESULTS OF THE STUDY IN RELATION TO THE STUDY'S AIM, OBJECTIVES AND NULL HYPOTHESES

The study's aim (as stated in Section 2.1) was "To assess, define and describe the weight control behaviours and body image perception of 8-9 year old preadolescent girls in Grade 3, in the Northeastern area of Johannesburg, South Africa and identify factors that impact on these aspects." This was accomplished in this study.

The study's objectives (as stated in Section 2.2) were "to assess the learners' body image perception," "to examine the learners' general perception of body shape and size in relation to their peers," "to compare learners' body image perception with anthropometric data" and "to investigate selected factors that may affect the subjects' body image," with selected factors being "socioeconomic status," "parents' weight control behaviours and attitudes towards eating and weight," "subjects' weight control behaviours," "influence of peers," "societal influences (i.e. media and cultural influences)" and "physical activity level." All these objectives were covered in this study and the relation between body image and the aforementioned factors addressed.

The first of the null hypotheses detailed in Section 2.3 states that "There is no significant difference in body image perception between subjects of different ethnic groups." This null hypothesis can be accepted to an extent as it was found that there was no statistically significant difference between the Black and White ethnic groups in relation to their BDS. However, no meaningful data could be obtained on the Coloured and Indian subjects as they made up the minority of the sample, whereas the Black and White subjects made up the clear majority of the sample. This type of distribution of the population between the ethnic groups is representative of the situation in Northeastern Johannesburg and the Gauteng province as a

whole⁷⁵ and therefore it is to be expected in such a study conducted in Gauteng. However, it would be of benefit to have been able to include more Coloured and Indian subjects to obtain more detail on these two ethnic groups in relation to the parameters investigated in this study. Therefore in order to accept the null hypothesis and state with certainty that there was no significant difference between the ethnic groups, it would be necessary to conduct future research in the form of a similar study such as this, but to include more Coloured and Indian subjects.

The second of the null hypotheses in Section 2.3 states that “There is no significant relationship between the learners’ anthropometric status and their body image perception.” This null hypothesis may be rejected since in this study it was found that those subjects that were classified - according to their BMI - as being underweight or at risk of underweight had a positive BDS and thus wanted to be larger; those that were classified as being overweight or at risk of overweight had a negative BDS and thus wanted to be thinner; and those that were classified - based on their BMI - as being at a healthy weight had a BDS of zero and thus were satisfied with their weight.

The third of the null hypotheses in Section 2.3 states that “The aforementioned factors (i.e. selected factors that may affect body image perception as mentioned in relation to the second null hypothesis above) play no role in the development of distorted body image perception or weight control behaviours in this age group.” The results of this study allow for the rejection of this null hypothesis, since many of the factors suggested by other studies^{5, 9, 17, 18, 20-39, 45-59} as affecting body image perception were also found in this study to significantly affect the subjects’ body image perception, body satisfaction and weight control behaviours (e.g. influences of family, peers, culture and the media).

5.3 LIMITATIONS, RECOMMENDATIONS AND FUTURE RESEARCH OPPORTUNITIES

5.3.1 Concern over weight-related questions

Due to the sensitive nature of the study many parents did not give consent for their children to take part in the study, citing fear of causing body image disturbances amongst children who had not exhibited such problems before. However, research has been done, which found no

conclusive evidence to suggest that completing questionnaires related to body image issues and eating behaviours creates disturbances in these areas where such disturbances were not present before. In fact it was concluded that such questions can actually help to create more awareness around these issues.⁹⁶ One could therefore consider the possibility that if a parent did not want his/her child to participate in this study in case this arouses weight-related disturbances in the child, this fear could be a reflection of the parent's own body image concerns. What is of concern is that a sizeable sector of the children that were not given consent to participate may have been children most at risk of body image disorders or may have already been suffering from body image disorders. The unfortunate result of the abovementioned problem is that those children with potentially the worst body image perceptions and/or those most at risk of body image disturbances may have been excluded from the study because their parents refused to give their consent and/or the child refused to give assent.

5.3.2 Cultural differences in responding to questions

As pointed out by Le Grange *et al*, some of the questions may have been interpreted differently by some of the subjects due to different interpretations the various ethnic groups may have had to some of the questions. For example, some of the subjects may have interpreted the question asking whether they starve themselves to lose weight, as weight loss being an unavoidable consequence of poor food security, rather than a chosen weight loss method.¹⁵ In addition, despite the assurance of the schools involved that the subjects were comfortable with English, there is the possibility that language barriers may also affected the subjects response to and understanding of certain questions. The investigator found that in general the subjects were able to understand the questionnaire, although there were the select few subjects for whom their English was poorer and they needed additional input and help from the investigator with understanding the questionnaire.

5.3.3 Alterations and omissions of questions from the questionnaire

As mentioned previously, certain questions in the questionnaire were poorly-understood by the subjects or were considered superfluous by the investigator. Such questions were altered (Appendix 2) or omitted altogether after the results of the pilot study were considered. Every care was taken to ensure that the altered questions retained their meaning and that the

omission of questions did not detract from the quality of the study. However, there should ideally have been a second pilot study to ensure the validity of the study once these changes had taken place.

5.3.4 Confidence level and error

As mentioned previously, 385 subjects would've given a 5% error within a 95% confidence level. However, at the 95% confidence level with the smaller sample size of 204 respondents the expected margin of error was 6.87%. Therefore the results obtained in this study are not as precise as ideally one would have desired. As a result it would have been ideal if a larger sample size could have been used to improve the margin of error.

5.3.5 Future research opportunities

There are several research opportunities that have emerged from this study that would be of value to pursue:

It would be interesting to compare the answers of the subjects whose parents refused consent versus those who gave consent. It also would be interesting to administer a similar questionnaire to the subjects' mothers as well, as was done in the Mciza *et al*⁵ study, to further determine the effect of the mother-daughter relationship on the subjects' eating behaviours and body image perception.

This study only covered body image perception preadolescent girls in Northeastern Johannesburg. Therefore it would be useful to do further research to discover the situation of preadolescent girls in the rest of Johannesburg and South Africa as a whole.

The ideal would also be to be able to study girls as well as boys to get an idea of gender differences with respect to body image perception. There is currently a paucity of data with respect to boys' body image perception.⁸¹ It would also be useful to have the children look at a Silhouette Perception Scale of adult women, as has been done in other research,⁹⁷ and then to ask similar questions to those asked in this study (e.g. which picture they'd like to look like). This would give an idea of how they perceive adult body ideals.

Unlike other similar studies, no significant relationships were found between body satisfaction and SES^{5, 17-18} or body satisfaction and physical activity type and frequency.⁹ However, it is this author's opinion that children who take part in aesthetic sports should be particularly closely monitored for potential disordered eating behaviours due to the link found between aesthetic sports participation and body dissatisfaction found in other research.⁹ In addition these questions on physical activity type and level, as well as on SES were not well-answered. More specifically, with regard to the subjects' SES, one of the other questions, which was in the original questionnaire and would give an indication of the SES was a question about the subjects' parents' educational level. However, as mentioned earlier, this question was not well-answered as the subjects did not know this information about their parents. In addition, the two parameters that were included to measure SES (i.e. household size and number of siblings) is not necessarily only indicative of SES, as it is possible that the subjects come from a large family, which is out of choice, has been planned for and can be afforded by the subjects' parents. Therefore, it could be hypothesized that not enough significant data could be obtained on SES to make definite conclusions regarding the effect of SES on body image perception and satisfaction. Thus more detailed research is needed on SES, as well as physical activity, to further elucidate the role (or lack thereof) of these factors' in body image related issues.

It would be worthwhile investigating different body image disorder prevention programmes at the primary school level. Based on this investigation an effective and accessible programme could be developed which addresses many – if not all – of the aspects of body image disorders. This should be geared towards truly helping children in this area of their lives.

All in all there is clearly a need for further research on body image in preadolescent children. This will enable further understanding of this problem and its aetiology, so that the problem can be managed to the extent of radically decreasing the extent of occurrence of full-blown eating disorders and disordered eating behaviours in later life.

REFERENCES

1. Littleton HL, Ollendick T. Negative body image and disordered eating behavior in children and adolescents: what places youth at risk and how can these problems be prevented? *Clin Child Fam Psychol Rev* 2003; 6(1):51-66.
2. http://en.wikipedia.org/wiki/Disordered_eating (accessed 4th August 2010)
3. <http://www.sportsmedicinedictionary.com/definition/disordered-eating.html> (accessed 4th August 2010)
4. <http://medical-dictionary.thefreedictionary.com/body+image> (accessed 4th August 2010)
5. Mciza Z, Goedecke JH, Steyn NP, Charlton K, Puoane T, Meltzer S *et al.* Development and validation of instruments measuring body image and body weight dissatisfaction in South African mothers and their daughters. *Publ Health Nutr* 2005; 8:509-519
6. <http://www.swedauk.org/disorders/disorders.htm>. Somerset and Wessex Eating Disorders Association (accessed 4th August 2010)
7. Jones JM, Bennett S, Olmsted MP, Lawson ML, Rodin G. Disordered eating attitudes and behaviours in teenaged girls: a school-based study. *CMAJ* 2001; 165:547-52.
8. World Health Organization. Very Young Adolescents: the hidden young people. Technical meeting on 10 – 14 year olds. 2003 29 Apr – 2 May. Geneva, Switzerland.
9. Davison KK, Earnest MB, Birch LL. Participation in Aesthetic Sports and Girls' Weight Concerns at Ages 5 and 7 Years. *Int J Eat Disord* 2002; 31:312-317.
10. Bryant-Waugh R, Lask B. Eating disorders in children. *J Child Psychol Psych* 1995; 36:191-202.
11. Sasson A, Lewin C, Roth D. Dieting Behavior and Eating Attitudes in Israeli Children. By: *Int J Eat Disord* 1995; 17:67-72.
12. Rolland K, Farnill D, Griffiths RA. Body Silhouette Perceptions and Eating Attitudes Among Australian Schoolchildren Aged 8 to 12 Years. *Int J Eat Disord* 1997; 21:273-278.
13. Li Y, Hu X, Ma W, Wu J, Ma G. Body image perceptions among Chinese children and adolescents. *Body image* 2005; 2(2):91-103
14. Holub SC. Individual differences in the anti-fat attitudes of preschool-children: The importance of perceived body size. *Body image* 2008; 5(3):317-321

15. Le Grange DL, Louw J, Breen A, Katzman MA. The meaning of "self-starvation" in impoverished Black adolescents in South Africa. *Cult, Med and Psych* 2004; 28:439-461.
16. Caradas AA, Lambert EV, Charlton KE. An ethnic comparison of eating attitudes and associated body image concerns in adolescent South African schoolgirls. *J Hum Nutr Dietet* 2001; 14:111-120.
17. De Souza Ferreira JE, Da Veiga GV. Eating disorder risk behavior in Brazilian adolescents from low socio-economic level. *Appetite* 2008; 51(2):249-55.
18. Robinson TN, Chang JY, Haydel KF, Killen JD. Overweight concerns and body dissatisfaction among third-grade children: the impacts of ethnicity and socioeconomic status. *J Pediatr* 2001; 138(2):158-60.
19. Maffei C, Talamini G, Tatò L. Influence of diet, physical activity and parents' obesity on children's adiposity: a four-year longitudinal study. *Int J Obes Relat Metab Disord* 1998; 22(8):758-64.
20. Sinton MM, Birch LL. Weight Status and Psychosocial Factors Predict the Emergence of Dieting in Preadolescent Girls. *Int J Eat Disord* 2005; 38:346-354
21. Gable S, Chang Y, Krull JL. Television watching and frequency of family meals are predictive of overweight onset and persistence in a national sample of school-aged children. *J Am Diet Assoc* 2007; 107(1):53-61.
22. McCabe MP, Ricciardelli LA. A prospective study of pressures from parents, peers, and the media on extreme weight change behaviors among adolescent boys and girls. *Behav Res and Ther* 2005; 43:653-668.
23. Schur EA, Sanders M, Steiner H. Body Satisfaction in Young Children. *Int J Eat Disord* 2000; 27:74-82.
24. Ogden J, Steward J. The Role of the Mother-Daughter Relationship in Explaining Weight Concern. *Int J Eat Disord* 2000; 28:78-83.
25. Lee Y, Mitchell DC, Smiciklas-Wright H, Birch LL. Maternal influences on 5- to 7-year-old girls' intake of multivitamin-mineral supplements. *Pediatrics* 2002; 109(3):E46 .
26. Dapi LN, Omoloko C, Janlert U, Dahlgren L, Håglin L. J Nutr Educ Behav. "I eat to be happy, to be strong, and to live." perceptions of rural and urban adolescents in Cameroon, Africa. *J Nutr Educ Behav* 2007; 39(6):320-6.
27. Jaffe K, Worobey J. Mothers' attitudes toward fat, weight, and dieting in themselves and their children. *Body image* 2006; 3(2):113-120

28. Kluck AS. Family influence on disordered eating: The role of body image dissatisfaction. *Body image* 2010; 7(1):8-14
29. Meyer TA, Gast J. The effects of peer influence on disordered eating behavior. *J School Nurs* 2008; 24(1):36-42.
30. Field AE, Austin SB, Taylor CB, Malspeis S, Rosner B, Rockett HR *et al.* Relation Between Dieting and Weight Change Among Preadolescents and Adolescents. *Pediatrics* 2003; 112:900-906.
31. McVey G, Tweed S, Blackmore E. Dieting among preadolescent and young preadolescent females. *CMAJ* 2004; 170:1559-61.
32. Altabe M. Ethnicity and Body image: Quantitative and Qualitative Analysis. *Int J Eat Disord.* 1998; 23:153-159.
33. Thompson SH, Corwin SJ, Sargent RG. Ideal Body Size Beliefs and Weight Concerns of Fourth-Grade Children. *Int J Eat Disord* 1997; 21:279-284.
34. Neumark-Sztainer D, Croll J, Story M, Hannan PJ, French SA, Perry C. Ethnic/racial differences in weight-related concerns and behaviors among adolescent girls and boys: findings from Project EAT. *J Psychosom Res* 2002; 53(5):963-74.
35. Cusumano DL, Thompson JK. Media Influence and Body image in 8-11 Boys and Girls: A Preliminary Report on the Multidimensional Media Influence Scale. *Int J Eat Disord* 2000; 29:37-44.
36. Hargreaves DA. Idealized media images and adolescent body image: "comparing" boys and girls. *Body Image* 2004; 1(4): 351-361
37. Field AE, Cheung L, Wolf AM, Herzog DB, Gortmaker SL, Colditz GA. Exposure to the Mass Media and Weight Concerns Among Girls. *Pediatrics* 1999; 103(Suppl 3):E36
38. DeBate RG, Thompson SH. Girls on the Run: Improvements in self-esteem, body size satisfaction and eating attitudes/behaviors. *Eat Weight Disord* 2005; 10:25-32.
39. Slater A, Tiggemann M. The Contribution of Physical Activity and Media Use during Childhood and Adolescence to Adult Women's Body image. *J Health Psych* 2006; 11:553-565
40. Peltzer K. Leisure Time Physical Activity and Sedentary Behavior and Substance Use Among In-School Adolescents in Eight African Countries. *Int J Behav Med* 2010 Jan 7. [Epub ahead of print]

41. Craig LC, McNeill G, MacDiarmid JI, Masson LF, Holmes BA. Dietary patterns of school-age children in Scotland: association with socio-economic indicators, physical activity and obesity. *Br J Nutr* 2010; 103(3):319-34.
42. Anderson SE, Economos CD, Must A. Active play and screen time in US children aged 4 to 11 years in relation to sociodemographic and weight status characteristics: a nationally representative cross-sectional analysis. *BMC Public Health* 2008; 22(8):366.
43. Poudevigne MS, O'Connor PJ, Laing EM, Wilson MR, Modlesky CM, Lewis RD. Body images of 4–8-Year-Old Girls at the Outset of Their First Artistic Gymnastics Class. *Int J Eat Disord* 2003; 34:244-250.
44. Striegel-Moore RH, Franko DL, Thompson D, Barton B, Schreiber GB, Daniels SR. Changes in Weight and Body image over Time in Women with Eating Disorders. *Int J Eat Disord* 2004; 36:315-327
45. Hill AJ, Pallin V. Dieting Awareness and Low Self-Worth: Related Issues in 8-Year-Old Girls. *Int J Eat Disord* 1998; 24:405-413.
46. Sharpe TM, Killen JD, Bryson SW, Shisslak CM, Estes LS, Gray N *et al.* Attachment Style and Weight Concerns in Preadolescent and Adolescent Girls. *Int J Eat Disord* 1998; 23:39-44
47. Israel AC, Ivanova MY. Global and dimensional self-esteem in preadolescent and early adolescent children who are overweight: age and gender differences. *Int J Eat Disord* 2002; 31(4):424-9.
48. Stockton MB, Lancot JQ, McClanahan BS, Klesges LM, Klesges RC, Kumanyika S *et al.* Self-perception and Body image Associations with Body Mass Index among 8-10-year-old African American Girls. *J Pediatr Psychol* 2009; 34(10):1144-54
49. Mirza NM, Davis D, Yanovski JA. Body dissatisfaction, self-esteem, and overweight among inner-city Hispanic children and adolescents. *J Adolescent Health* 2005; 36:267.e16-267.e20
50. Ohring R, Graber JA, Brooks-Gunn J. Girls' Recurrent and Concurrent Body Dissatisfaction: Correlates and Consequences over 8 Years. *Int J Eat Disord* 2002; 31:404-415.
51. Sands ER, Wardle J. Internalization of Ideal Body Shapes in 9–12-Year-Old Girls. *Int J Eat Disord* 2003; 33:193-204.

52. Gualdi-Russo E, Albertini A, Argnani L, Celenza F, Nicolucci M, Toselli S. Weight status and body image perception in Italian children. *J Hum Nutr Diet* 2008; 21(1):39-45.
53. Wang Y, Liang H, Chen X. Measured body mass index, body weight perception, dissatisfaction and control practices in urban, low-income African American adolescents. *BMC Public Health* 2009; 12(9):183.
54. Abraham S, O'Dea JA. Body Mass Index, Menarche, and Perception of Dieting Among Peripubertal Adolescent Females. *Int J Eat Disord* 2001; 29:23-28.
55. Carter JC, Stewart DA, Fairburn CG. Eating disorder examination questionnaire: norms for young adolescent girls. *Behav Res Ther* 2001; 39(5):625-32.
56. Kelly C, Ricciardelli LA, Clarke JD. Problem Eating Attitudes and Behaviours in Young Children. *Int J Eat Disord* 1999; 25:281-286.
57. Cornette R. The emotional impact of obesity on children. *Worldviews Evid Based Nurs* 2008; 5(3):136-41.
58. Williamson S, Delin C. Young Children's Figural Selections: Accuracy of Reporting and Body Size Dissatisfaction. *Int J Eat Disord* 2001; 29:80-84
59. Wills W, Backett-Milburn K, Gregory S, Lawton J. Young teenagers' perceptions of their own and others' bodies: A qualitative study of obese, overweight and "normal" weight young people in Scotland. *Soc Sci Med* 2006; 62:396-406
60. Duncan MJ, Al-Nakeeb Y, Nevill AM. Body esteem and body fat in British school children from different ethnic groups. *Body image* 2004; 1(3):311-315
61. Kolawole KA, Otuyemi OD, Adeosun OD. Nicknames and name calling among a population of Nigerian schoolchildren. *Eur J Paediatr Dent* 2009; 10(3):115-20.
62. Salokun SO, Toriola AL. Perceived somatotype and stereotypes of physique among Nigerian schoolchildren. *J Psychol* 1985; 119(6):587-94.
63. Mokhtar N, Elati J, Chabir R, Bour A, Elkari K, Schlossman NP, *et al.* Diet culture and obesity in northern Africa. *J Nutr* 2001; 131(3):887S-892S.
64. Puoane T, Fourie JM, Shapiro M, Rosling L, Tshaka NC, Oelofse A. "Big is beautiful" – an exploration of urban Black women in a South African township. *SAJCN* 2005; 18(1):6-15.
65. Stevens J, Cornell CE, Story M, French SA, Levin S, Becenti A, *et al.* Development of a questionnaire to assess knowledge, attitudes and behaviors in American Indian children. *Am J Clin Nutr* 1999; 69 (4): 773S-781S

66. Bravender T, Bryant-Waugh R, Herzog D, Katzman D, Kriepe RD, Lask B *et al.* Classification of eating disturbance in children and adolescents: Proposed changes for the DSM-V. *Eur Eat Disord Rev* 2010; 18(2):79-89.
67. American Dietetic Association. Position of the American Dietetic Association: Nutrition intervention in the treatment of anorexia nervosa, bulimia nervosa, and other eating disorders. *J Am Diet Assoc* 2006; 106(12):2073-82.
68. Miyake Y, Okamoto Y, Onoda K, Kurosaki M, Shirao N, Okamoto Y *et al.* Brain activation during the perception of distorted body images in eating disorders. *Psychiat Res* 2010; 181(3):181-192.
69. Fandiño J, Moreira RO, Preissler C, Gaya CW, Papelbaum M, Coutinho WF, Appolinario JC. Impact of binge eating disorder in the psychopathological profile of obese women. *Compr Psychiat* 2010; 51(2):110-114.
70. Levine MP, Piran N. The role of body image in the prevention of eating disorders. *Body image* 2004; 1(1):57-70
71. Rosenblum J, Forman S . Evidence-based treatment of eating disorders. *Curr Opin Pediatr* 2002; 14(4):379-83.
72. City of Johannesburg website – The seven regions. [Online] Available: <http://www.joburg.org.za/content/view/170/50>. 1994. Accessed September 2009.
73. Maloney M, McGuire J, Daniels S. Reliability testing of a children's version of the Eating Attitudes Test. *J Amer Acad Child and Adoles Psych* 1988; 5:541-543.
74. McVeigh JA, Norris SA, Cameron N, Pettifor JM. Associations between physical activity and bone mass in Black and White South African children at age 9 yr. *J Appl Physiol* 2004; 97:1006-1012.
75. Census 2001 – Census in brief. [Online] Available: (<http://www.statssa.gov.za/census01/html/CInBrief/CIB2001.pdf>) (accessed Dec 2009)
76. Schwabe C. Fact Sheet: Poverty in South Africa. Human Sciences Research Council. 26 July 2004
77. Yang K. A thought on the integration of poverty relief with family planning. *Chin J Popul Sci* 1997; 9(1):19-24.
78. Galobardes B, Shaw M, Lawlor DA, Lynch JW, Smith GD. Indicators of socioeconomic position (part 1). *J Epidemiol and Comm Health* 2006; 60:7-12.
79. Anton SD, Perri MG, Riley JR. Discrepancy between actual and ideal body images: Impact on eating and exercise behaviours. *Eat Behav* 2000; 1(2):153-160

80. Smolak L, Levine MP. Psychometric Properties of the Children's Eating Attitudes Test. *Int J Eat Disord* 1994; 16:275-282.
81. Smolak L. Body image in children and adolescents: where do we go from here? *Body image* 2004; 1(1):15-28
82. Centre for Disease Control – Clinical BMI-for-age Growth Charts. Available: <http://www.cdc.gov/growthcharts/data/set1clinical/cj411024.pdf>. 2004. Accessed: June 2009
83. Nunnally JC, Bernstein I. *Psychometric Theory*. 3rd ed. New York: McGraw Hill, 1994: 248-292
84. Gordon-Larsen P, McMurray RG, Popkin BM. Adolescent physical activity and inactivity vary by ethnicity: the National Longitudinal Study of Adolescent Health. *J Pediatr* 1997; 135:301-306
85. Pate RR, Heath GW, Dowda M, Trost SG. Associations between physical activity and other health behaviours in a representative sample of US adolescents. *Am J Publ Health* 1996; 86:1577-1581
86. Faith MS, Berman N, Heo M, Pietrobelli A, Gallagher D, Epstein LH *et al*. Effects of Contingent Television on Physical Activity and Television Viewing in Obese Children. *Pediatrics* 2001; 107:1043-1048
87. Hammond KA. Chapter 16: Dietary and Clinical Assessment. In: Mahan LK, Escott-Stump S, eds. *Krause's Food, Nutrition, & Diet Therapy*. 10th ed. Philadelphia: W.B. Saunders, 2000: 353-379.
88. StatSoft Inc. (2007) STATISTICA (data analysis software system), Version 8. www.statsoft.com.
89. Saxton J, Hill C, Chadwick P, Wardle J. Weight status and perceived body size in children. *Arch Dis Child* 2009; 94(12):944-9
90. Puoane T, Tsolekile L, Steyn N. Perceptions about body image and sizes among Black African girls living in Cape Town. *Ethn Dis* 2010; 20(1):29-34.
91. Rodgers RF, Paxton SJ, Chabrol H. Effects of parental comments on body dissatisfaction and eating disturbance in young adults: a sociocultural model. *Body Image* 2009; 6(3):171-7.
92. Charlton KE, Rose D. Prevalence of household food poverty in South Africa: results from a large, nationally representative survey. *Publ Health Nutr* 2002; 5(3):383-9.

93. Bourne LT, Langenhoven ML, Steyn K, Jooste PL, Laubscher JA, Van der Vyver E. Nutrient intake in the urban African population of the Cape Peninsula, South Africa. The Brisk study. *Cent Afr J Med* 1993; 39:238-47.
94. Nel JH, Steyn NP. *Report on South African food consumption studies undertaken amongst different population groups, 1983-2000: average intakes of foods most commonly consumed*. Pretoria: Department of Health; 2002.
95. Steyn NP, Myburgh NG, Nel JH. Policy and practice. Evidence to support a food-based dietary guideline on sugar consumption in South Africa. *Bull World Health Organ* 2003; 81(8):599-608
96. Celio AA, Bryson S, Killen JD, Barr Taylor C. Are Adolescents Harmed When Asked Risky Weight Control Behavior and Attitude Questions? Implications for Consent Procedures. *Int J Eat Disord* 2003; 34:251-254.
97. Harrison K. The Multidimensional Media Influence Scale: Confirmatory factor structure and relationship with body dissatisfaction among African American and Anglo American children. *Body image* 2009; 6(3): 207-215

APPENDIX 1:**DATA-GATHERING QUESTIONNAIRE****DATE OF BIRTH:** _____Instructions

1. Please read and answer each question carefully
2. Where more than one option is given, put a “X” next to the answer that is most true for you
3. Sometimes you will need to answer the question with a number and sometimes you will need to answer with a word.

SECTION 1: SOCIOECONOMIC STATUS

1.1 How many people live in your house including you?

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1.2 How many brothers and sisters do you have?

Brothers	
Sisters	

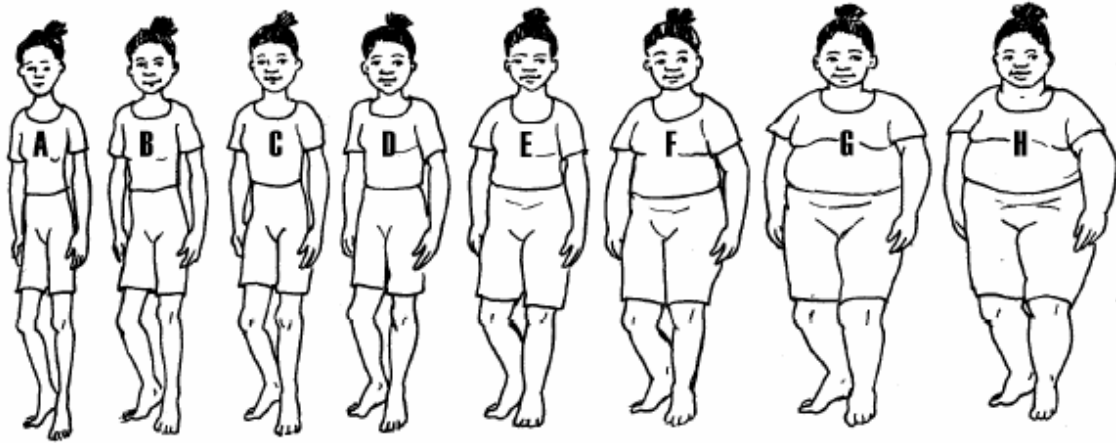
1.3 Who looks after you for most of the time?

Your mother	1
Your father	2
Your mother and father	3
Your sister/brother	4
Your grandmother	5
Your grandfather	6
Other	7

1.4 Which language is spoken at home most of the time?

Sotho	1	English	2
-------	---	---------	---

Afrikaans	3
Zulu	4
Other	5

SECTION 2: BODY IMAGE PERCEPTION AND BODY SHAPE SATISFACTION

A B C D E F G H

2.1 Choose from the picture above the girl that you think is:

Thin	
Normal weight	
Fat	

2.2 Choose the girl from the picture above that you think will:

Look best	
Be clumsy	
Other people will be most proud of	
Other people will be least proud of	
Be the strongest	
Be the weakest	
Be the most happy	
Be the most unhappy	

2.3 Which one of the pictures from the picture above do you look most like?

2.4 Which one of the pictures from the picture above would you most like to look like?

2.5 How happy are you with your weight now?

Very happy	1
Quite happy	2
Quite unhappy	3
Very unhappy	4

2.6 Do you think you are:

Thin	1
Just right	2
Fat	3

2.7 Do you worry about being thin?

Yes	1
No	2

2.8 Do you worry about being fat?

Yes	1
No	2

SECTION 3: FAMILY AND PEER INFLUENCES

3.1 Choose the girl that:

Your mom/dad/grandma/grandpa/sister/brother would want you to look like	
Your friends would want you to look like	

3.2 Has anyone in your family ever told you that you are thin?

Yes	1
No	2

3.3 Have your friends ever told you that you are thin?

Yes	1
No	2

3.4 Has anyone in your family ever told you that you are fat?

Yes	1
No	2

3.5 Have your friends ever told you that you are fat?

Yes	1
No	2

3.6 Is anyone in your family fat?

Yes	1
No	2

3.7 If yes, which of your family members are fat?

Mother	1
Father	2
Brother	3
Sister	4
Grandparent	5

3.8 Has anyone in your family tried to lose weight?

Yes	1
No	2

3.9 If yes, who in your family has tried to lose weight?

Mother	1
Father	2
Brother	3
Sister	4
Grandparent	5

3.10 Have any of your friends tried to lose weight?

Yes	1
No	2

SECTION 4: WEIGHT CONTROL BEHAVIOURS

4.1 Have you ever tried to lose weight or are you trying to lose weight now?

Yes	1
No	2

4.2 If you have tried to lose weight, what ways have you used to try and lose weight?:

Eat less food	1
Exercise more	2
Skip some meals	3
Don't eat the whole day	4
Use weight loss medicines	5
Other	6

4.3 Have you ever tried to gain weight or are you trying to gain weight now?

Yes	1
No	2

4.4 If you have tried to gain weight, what ways have you used to try and gain weight?:

Eat more food	1
Exercise less	2
Eat more meals than I usually eat	3
Other	4

4.5 I think about getting thinner when I exercise

Yes	1
-----	---

No	2
----	---

4.6 I stay away from foods with sugar in them

Yes	1
No	2

4.7 I eat diet foods

Yes	1
No	2

4.8 I try to stay away from foods such as breads, potatoes, and rice

Yes	1
No	2

4.9 I feel very guilty after eating sweets

Yes	1
No	2

SECTION 5: CULTURAL AND MEDIA INFLUENCES

5.1 If a girl your age is **thin** she would:

a) Have more friends	Yes = 1	No = 0
b) Feel better about herself	Yes = 1	No = 0
c) Be prettier	Yes = 1	No = 0
d) Feel more like a girl	Yes = 1	No = 0
e) Be healthier	Yes = 1	No = 0

5.2 If a girl your age is **fat** she would:

a) Have more friends	Yes = 1	No = 0
b) Feel better about herself	Yes = 1	No = 0
c) Be prettier	Yes = 1	No = 0
d) Feel more like a girl	Yes = 1	No = 0
e) Be healthier	Yes = 1	No = 0

5.3 Do you ever wish you looked more like girls in magazines or on TV?

Yes	1
No	2

5.4 Do you think you would be happier if you looked more like girls in magazines or on TV?

Yes	1
No	2

5.5 Do you and your friends discuss people that you see in magazines or on TV?

Yes	1
No	2

SECTION 6: PHYSICAL ACTIVITY AND AESTHETIC SPORTS

Formal physical activity

6.1 Physical activity at school:

How many times a week do you have physical education/P.E./games lessons at school?

Never	1
Once a week	2
Twice a week	3
Three times a week	4
Four or more times a week	5

6.2 Organized sporting activities:

Do you do any of the following activities?

If yes, how many days a week do you do these activities?

Sport	Tick (✓) if you do this sport			How many times a week do you do this sport?	
				Put a tick (✓) over the one that is correct	
Athletics		Once a week	Twice a week	Three times a week	Four times a week or more
Swimming		Once a week	Twice a week	Three times a week	Four times a week or more
Tennis		Once a week	Twice a week	Three times a week	Four times a week or more
Hockey		Once a week	Twice a week	Three times a week	Four times a week or more
Netball		Once a week	Twice a week	Three times a week	Four times a week or more

Soccer		Once a week	Twice a week	Three times a week	Four times a week or more
Basketball		Once a week	Twice a week	Three times a week	Four times a week or more
Cycling		Once a week	Twice a week	Three times a week	Four times a week or more
Dancing (e.g. ballet, tap, hip-hop, modern)		Once a week	Twice a week	Three times a week	Four times a week or more
Gymnastics		Once a week	Twice a week	Three times a week	Four times a week or more
Judo / karate		Once a week	Twice a week	Three times a week	Four times a week or more
Squash		Once a week	Twice a week	Three times a week	Four times a week or more
Volleyball		Once a week	Twice a week	Three times a week	Four times a week or more
Other:		Once a week	Twice a week	Three times a week	Four times a week or more

Informal physical activity

6.3 Other Physical Activity:

Do you do any other physical activities not at school or part of a sport, such as riding a bike, playing outside, etc? What activities do you do, how often & how long?

Activity	Tick (✓) if you do this activity	How many times a week do you do this activity? Put a tick (✓) over the one that is correct		
Riding a bike	Once a week	Twice a week	Three times a week	Four times a week or more
Playing outside	Once a week	Twice a week	Three times a week	Four times a week or more
Running	Once a week	Twice a week	Three times a week	Four times a week or more
Kicking a ball	Once a week	Twice a week	Three times a week	Four times a week or more
Swimming	Once a week	Twice a week	Three times a week	Four times a week or more
Walking	Once a week	Twice a week	Three times a week	Four times a week or more
Rollerblading or roller-skating	Once a week	Twice a week	Three times a week	Four times a week or more
Other: _____	Once a week	Twice a week	Three times a week	Four times a week or more

		week	week	more

6.4 Physical Activity incurred from Commuting:

How do you get to school?

By car	Yes = 1	No = 2
By bus	Yes = 1	No = 2
By taxi	Yes = 1	No = 2
By walking	Yes = 1	No = 2
By riding a bicycle	Yes = 1	No = 2

6.5 Sedentary Activities:

Do you do any of the following activities?

If so, for how many hours per day?

			How many hours per day
Watching TV and videos	Yes=1	No=2	
Using a computer	Yes=1	No=2	
Reading, drawing, music lessons, homework	Yes=1	No=2	
Playing video games	Yes=1	No=2	

APPENDIX 2:

CHANGES MADE TO SPECIFIC QUESTIONS IN THE QUESTIONNAIRE

- In Question 2.2, “Have more respect from others” and “Have less respect from others” were replaced with “Other people will be most proud of” and “Other people will be least proud of” respectively to make it easier for the subjects to understand.
- In Questions 2.3 and 2.4, “Which one of the pictures do you look most like?” and “Which one of the pictures would you most like to look like?” were replaced with “Which one of the pictures from the picture above do you look most like?” and “Which one of the pictures from the picture above would you most like to look like?” to clarify the question and to make it easier to understand.
- In Question 2.5, “How happy are you with your present weight?” was replaced with “How happy are you with your weight now?” once again to improve understanding of the question and make it easier for the subjects to answer.
- In Questions 3.2 and 3.4, “Have your mom/dad/grandma/grandpa/sister/brother ever told you that you are thin?” and “Have your mom/dad/grandma/grandpa/sister/brother ever told you that you are fat?” were changed to “Has anyone in your family ever told you that you are thin?” and “Has anyone in your family ever told you that you are fat?” respectively. Once again to help prevent respondent fatigue, to clarify the question and to prevent exclusion of other family members that may be relevant but not mentioned (e.g. aunts, uncles, cousins, etc).
- In Question 3.6, “Are any of your family members overweight?” was changed to “Is anyone in your family fat?” to make it easier for the subjects to understand the question. Question 3.7’s “If yes, which of your family members are overweight? Circle all those that apply:” was changed to “If yes, which of your family members are fat?” for the same reason.
- In Question 3.8, “Have any of your family members been on a diet?” was changed to “Have anyone in your family tried to lose weight?” due to the subjects aforementioned misunderstanding of the word “diet.” Question 3.9’s “If yes, which of your family members have been on a diet overweight? Circle all those that apply:” and “Has a friend ever been on a diet to lose weight?” were

changed to “If yes, who in your family has tried to lose weight?” and “Have any of your friends tried to lose weight?” respectively for the same reason.

- The order of the first 4 questions of Section 4 was altered as can be seen in Table below. These changes were made to aid ease of understanding of these questions, as well as to improve the logical flow of the questionnaire.

Table A1: Altered order of Section 4 of Questionnaire

Previous order of first 4 questions of Section 4	Current order of first 4 questions of Section 4
4.1 Have you ever tried to lose weight or are you trying to lose weight now?	4.1 Have you ever tried to lose weight or are you trying to lose weight now?
4.2 Have you ever tried to gain weight or are you trying to gain weight now?	4.2 If you have tried to lose weight, what ways have you used to try and lose weight?:
4.3 Choose the method or methods you used/are using to lose weight (Answer this if you said yes to 4.1):	4.3 Have you ever tried to gain weight or are you trying to gain weight now?
4.4 Choose the method or methods you used/are using to gain weight (Answer this if you said yes to 4.2):	4.4 If you have tried to gain weight, what ways have you used to try and gain weight?:

- The question “I think about burning up energy (calories) when I exercise” (Q4.7) was changed to “I think about getting thinner when I exercise”
- The question “I feel unhappy when I eat sweets” was changed to “I feel very guilty after eating sweets” to differentiate between other emotions that may be attached to eating sweets and to establish whether the eating of sweets itself causes guilt.

APPENDIX 3:**PARTICIPANT INFORMATION LEAFLET FOR USE BY PARENTS/LEGAL GUARDIANS****TITLE OF THE RESEARCH PROJECT:****Aspects of body image perception of preadolescent girls in Northeastern Johannesburg.****REFERENCE NUMBER: N07/11/255****PRINCIPAL INVESTIGATOR: L BRUK****ADDRESS: WANDERERS WELLNESS CENTRE
WANDERERS CLUB
21 NORTH ST
ILLOVO 2196****CONTACT NUMBER: (011) 8809156/ 0832440163**

Your child (*or ward, if applicable*) is being invited to take part in a research project. Please take some time to read the information presented here, which will explain details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how your child could be involved. Also, your child's participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you or your child negatively in any way whatsoever. You are also free to withdraw him/her from the study at any point, even if you do initially agree to let him/her take part.

This study has been approved by the **Committee for Human Research at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the International Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?

Aims: To investigate how Grade 3 girls in Northeastern Johannesburg feel about their weight and body, and the extent to which they try to control their weight and eating.

Procedures: Your child will be need to fill in a questionnaire about how she feels about her weight and eating habits, as well as about her physical activity levels and will need to be weighed and have her height measured. The type of questions asked will involve your child selecting an answer from various options, as well as filling in specific short answers depending on what question is being asked. The questionnaire will probably take about an hour and a half to complete and this will be divided into two 45-minute sessions with a short

break in between. The measurements will be performed on the same day after the questionnaire has been completed.

Randomization: The schools and children that were selected to be part of the study were chosen randomly and therefore your child was selected completely at random to be part of the study.

Why has your child been invited to participate?

Your child has been invited to participate as she is in Grade 3 at a school in Northeastern Johannesburg and is between the ages of 8 and 9 years old.

What will your responsibilities be?

No burdens or responsibilities will be required of you, other than to familiarize yourself with this information, so that you feel comfortable with your child taking part in this study.

Will your child benefit from taking part in this research?

Your child will not benefit directly from the study, but the results of this study will help to better understand how Grade 3 girls feel about their body image, which in turn will help to create programmes to develop better body images amongst young girls.

Are there any risks involved in your child taking part in this research?

No, there are no risks involved in this study. All information will be kept totally confidential, and the information will only be used for this study, and not for any other purpose.

What are the consequences if your child does not take part?

There will be absolutely no consequences if your child does not take part, as it is entirely up to you and your child whether your child participates in the study. Participation in the study is totally voluntary and you are free to decide either way.

Will you or your child be paid to take part in this study and are there any costs involved?

You or your child will not be paid to take part in the study. There will also be no costs involved for you if your child does take part.

If there any further questions please call the investigator Lila Bruk on (011) 8809156, or the Committee for Human Research on (021) 9389207

You will receive a copy of this information and consent form for your own records

APPENDIX 4:**INFORMED CONSENT AND DECLARATIONS****INFORMED CONSENT AND DECLARATIONS BY PARENT/LEGAL GUARDIAN**

By signing below, I (*name of parent/legal guardian*) agree to allow my child (*name of child*) who is years old, to take part in a research study entitled

I declare that:

- I have read or had read to me this information and consent form and that it is written in a language with which I am fluent and comfortable.
- My child is older than 7 years and therefore has to agree to take part in the study and her ASSENT must be recorded on the appropriate form.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressured into letting my child take part.
- I may choose to withdraw my child from the study at any time and my child will not be penalised or prejudiced in any way.
- My child may be asked to leave the study before it has finished if the study investigator feels it is in my child's best interests, or if my child does not follow the study plan as agreed upon.

Signed at (place) on (date) 2008.

.....
Signature of parent/legal guardian

.....
Signature of witness

APPENDIX 5:**INFORMED ASSENT AND DECLARATION OF MINOR**

I (*Name of Child/Minor*) have been invited to take part in the above research project.

- The study investigator and my parent(s) have explained the details of the study to me and I understand what they have said to me.
- They have also explained that this study will involve me filling in a questionnaire, and my weight and height being measured.
- I also know that I am free to withdraw from the study if I am unhappy.
- By writing my name below, I voluntarily agree to take part in this research project. I confirm that I have not been forced either by my parents, school or the study investigator to take part.

.....
Name of child

.....
Independent witness