BODY IMAGE PERCEPTIONS, STRESS AND ASSOCIATED PSYCHOPATHOLOGIES IN A NON-CLINICAL SAMPLE.

THESIS

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Samantha Louise Noutch

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Bradford

West Yorkshire

BD7 1DP

“I cannot say often enough how much I consider beauty a powerful and advantageous quality. Socrates called it “A short tyranny,” and Plato “The privilege of nature” We have no quality that surpasses it in credit. It holds the first place in human relations; it presents itself before the rest, seduces and prepossesses our judgment with great authority and wondrous impression.”

Montaigne, *Essays*

“**Marilyn Monroe would be trying to diet herself to a size zero if she was on the cinema screen now, which is such a shame”**

Deanne Jade

Psychologist

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BODY IMAGE PERCEPTIONS, STRESS AND ASSOCIATED PSYCHOPATHOLOGIES IN A NON-CLINICAL SAMPLE

Samantha Noutch

Keywords: Body Dysmorphic Disorder, Body Mass Index, Beck Depression Inventory, Derriford Appearance Scale.

The aims of the studies were to assess body image perceptions, the role of stress and other possible associated psychopathologies within a non-clinical sample.

The prevalence of body image concern is increasing and is widely considered as secondary to evolving socio-cultural trends. Negative self-perceptions about body image can be manifest as measurable indicators of physiological stress, or even psychopathology. This thesis describes two quantitative studies into the role and relevance of various causative factors in the development of negative body image in cohorts of volunteers drawn from the general population of the University of Bradford in West Yorkshire, UK.

In Study One, subjects (n=360) completed a self-directed questionnaire that psychometrically measured satisfaction/dissatisfaction with personal appearance, queried which external sources influenced those opinions, and correlated these with demographic information. In particular, we sought to examine how a subject's opinion about their personal appearance varied with age, gender, ethnicity, mental health, relationship status, sexual orientation and Body Mass Index (BMI). Subjective views regarding personal appearance were determined by answers given to specific body image questions that revealed a subject's day-to-day appearance concerns, all preoccupations, and the extent to which these concerns resulted in distress, all social impairment.

Overall, the results demonstrated that BMI values were positively correlated with personal appearance concerns. High BMI values correlated with greater dissatisfaction with personal appearance. Self ratings of appearance values were negatively correlated with BMI scores. Subjects who gave themselves high appearance ratings were relatively unaffected by media influence with regard to their image, compared to subjects rating themselves less attractive. These latter subjects also showed higher peer pressure scores in terms of both the amount of time they compared themselves to peers, and the degree to which peer comparisons affected their self-appearance ratings. Based on responses to the body image questions specifically, the entire cohort of subjects were categorised into principal clusters: those largely unaffected by any body image concerns; and those profoundly distressed by their self assessed body image. Perhaps the most interesting aspect of these findings is that the scores for this latter (n=17) group of subjects on the body image questions revealed a degree of personal distress this is almost identical to the scores expected from those people diagnosed with body dysmorphic disorder (BDD). Collectively, these results suggest that high BMI values in subjects negatively impact on self-appearance ratings, render subjects more prone to media messages that portray body image ideals, and elicit frequent comparisons with peers to validate self-image concerns. Furthermore, severely affected subjects with high BMI scores may show similar psychopathology to that of BDD sufferers.

In Study Two, a small cohort of subjects (n=60) were given questionnaires and were interviewed to further investigate self-appearance ratings and mood/depressive traits. The body image questions used in Study One to assess image concerns and the magnitude of distress were repeated in Study Two. Mood and depressive state were measured using the validated Beck's Depression Inventory (BDI). In parallel, subjects completed the Derriford Appearance Scale 59 (DAS 59), which is a valid psychometric indication of an individual's perception of their appearance as 'normal' or 'disfigured', and used as a tool by plastic surgeons to inform decisions regarding the necessity for surgery to correct an individual's appearance. Physiological markers were recorded before and after exposure of subjects to a physical and a psychological stressor: these were saliva concentrations of cortisol and sIgA (an immune marker), blood glucose and blood pressure.

The results of Study Two revealed no changes in scores for any of the physiological measures following stressors. BDI scores for most subjects fell within normal ranges, although females scored higher than males, but not at a pathological level. Those subjects with a history of mental illness or those who reported feeling a high degree of stress on a daily basis, or those who expressed greater self-appearance concerns, all had significantly elevated BDI values. Perhaps the most intriguing finding from Study Two, as in Study One, was that subjects again tended to fall within specific categories for body image concerns: those unaffected or minimally affected by body image concerns, and those (n=6) greatly and deleteriously affected by body image concerns. This subsection of subjects also scored very high on the DAS 59 for disfigurement.

On the basis of these findings it would seem that body image concerns may be severe enough for some individuals for them to perceive themselves as actually being disfigured, or that the DAS 59 (a widely used assessment tool in plastic surgery), may not be entirely appropriate for assessment of an individual's need for surgery because it cannot distinguish between those genuinely disfigured and those merely expressing severe body image concerns.

For Mum & Dad

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LIST OF ABBREVIATIONS

5-HT	5-hydroxytryptamine (Serotonin)
5HIAA	5-hydroxyindoleacetic acid
ACh	Acetylcholine
AChE	Acetylcholine Esterase
ACTH	Adrenocorticotropic Hormone
AN	Anorexia Nervosa
ANS	Autonomic Nervous System
AVP	Arginine vasopressin
BMI	Body Mass Index
BDD	Body Dysmorphic Disorder
BDI	Beck's Depression Inventory
BN	Bulimia Nervosa
CRH	Corticotropin-releasing hormone
CNS	Central Nervous System
DAS 59	Derriford Appearance Scale
DSM	Diagnostic and Statistical Manual of Mental Disorders
E/A	Epinephrine/Adrenaline
EWLB	Extreme Weight Loss Behaviours
fMRI	Functional Magnetic Resonance Imaging
F-S	Full Score
FSC	Facial Self Consciousness of Appearance
G.A.S.	General Adaption Syndrome
GC	Glucocorticoid
GSC	General Self Consciousness of Appearance
HPA	Hypothalamic Pituitary Adrenal Axis
MAO	Monoamine Oxidase Inhibitors
MC	Mineralocorticoid

NE/NA	Norepinephrine/Noradrenaline
NHS	National Health Service
NIMH	National Institute of Mental Health
NSC	Negative Self Concept
OT	Oxytocin
PNS	Peripheral Nervous System
p: NS	Not Significant
POMC	Pro-opiomelanocortin
PVN	Paraventricular Nucleus
SAM	Sympathetic Adrenomedullary
SBSC	Sexual & Bodily Self Consciousness of Appearance
SNS	Somatic Nervous System
SSC	Social Self Consciousness of Appearance
SSRI's	Selective Serotonin Reuptake Inhibitors
TCA	Tricyclic Antidepressants
VNO	Vomeronasal Organ

CHAPTER ONE

1.1. INTRODUCTION & GENERAL REVIEW

1.1.1. GENERAL AIMS OF THE THESIS

This thesis is concerned with body image perceptions in a sample of students and staff opportunistically recruited from the University of Bradford. The research has been undertaken in two studies. Study One is a self-report questionnaire acquiring data on demographic information, body image and lifestyle. Study Two investigated body image perceptions using a series of externally validated questionnaires, (Becks Depression Inventory BDI, Derriford Appearance Scale DAS 59), specifically designed to explore questions on body image perceptions. These questionnaires were then compiled and correlated with physiological responses to an acute physical and psychological stress challenge.

In order to gain an appreciation of body image psychopathologies such as body dysmorphic disorder, we sought to associate body image perceptions with a stress response and depressive characteristics. For Study Two, we adopted an approach focusing on stress as a common feature of body dysmorphic disorder and depressive traits. Thus the interrelationship of body image and specific associated psychopathologies, i.e. depression and stress were examined. Hopefully, the data collected to help explain predictive factors in the development of body image perceptions.

Body image is formed by an accumulation of many variables, such as societal and cultural influences, evolution, sexual selection factors, media influences and peer groups. This thesis identifies general theories concerned with body image which are germane to both studies, and this background information will be covered in the general introduction. Furthermore, specific information on factors which are associated with the creation and influence of body image that are more specific to Study One and Study Two will be included within the introduction for these two studies.

1.2. EVOLUTION OF BEAUTY & SEXUAL SELECTION IN SOCIETY

The word cosmetic originates from the Greek "kosmetikos" meaning "skilled in adornment" where "kosmein" and "kosmos" translate to "arrange" and "order" respectively (Oumeish, 2001). Other meanings include "decorative" and "ornamental"; "intended to improve appearance"; "superficial"; "cosmetic substance made for the face and body" and "correction of facial deficits" (Oxford Dictionary, 2004). Human nature has maintained an interest in beauty and grooming for thousands of years. The Ancient Egyptian upper class men and women groomed and applied minerals to accentuate their eyes and face (Angeloglou, 1970). The Romans would use scented fragrances along with perfumed oils in their baths and water fountains, while the Greeks regularly applied makeup and styled their hair as a part of their grooming regime (Angeloglou, 1970).

Throughout our history we have developed beauty products, such as make up, face creams, and perfumes which used in conjunction with cosmetic tools such as scissors to cut and remove hair, and brushes to apply products to highlight facial features (Oumeish, 2001; Angeloglou, 1970). The sole purpose of using these make up products and grooming utensils was to enhance, aid and emphasize beauty (Angeloglou, 1970). Our records and historical information, conveyed via paintings, carvings, statues, engravings and prints, brilliantly document how the concept of beauty has evolved, and demonstrates how significant and important beauty was, and still is, today (Ebling, 1981).

As a consequence of evolution we may be the only species on earth that has evolved to the extent that we have surpassed the 'basic' survival pre-requisites, such as foraging for food, water, and shelter. We have developed and formed a fast-paced changing society: an 'ultra-social' entity (Vygotsky, 1978). Our 'ultra-social' society permits us to now think beyond our basic survival requirements and has shifted focus to current trends such as technology and media (Herrmann, 2007). Over many thousands of years we have created structure, systems and processes to better our lives. Undoubtedly the last 150- 200 years have seen an unprecedented expansion in our local and global perspectives of society and culture (Herrmann *et al*, 2007). Multiple advances within our society have been explained by culture intelligence (the ability to interact in, and with, many diverse groups and understand their cultural differences and similarities), and social intelligence (the ability to be aware of the social environment and ability to interact and co-operate within this). Arguably this is why we are so unique compared to other species with regards to our advances (Herrmann *et al*, 2007). No other species have advanced in the same way as homo-sapiens. We have developed multiple tools to better our lives such as transport systems, gained a wealth of

knowledge through education and careers paths, increased leisure time and introduced technology in our society. We have made a largely mysterious and unknown world into a much smaller place and opened a window into other cultures and societies, and adapted newer ideas and views. With this has come enormous benefits, but with regards to body image and beauty, problems are emerging.

The sociocultural theory is one of the strongest explanations as to why we shape and form perceptions as a child; one of its premises relates to our body image views. Vygotsky wrote that "every function in the child's cultural development appears twice: first on the social level and later on the individual level; first between people (inter-psychological) and then inside the child (intra-psychological)" (Vygotsky, 1978 pp57). It is likely that westernized sociocultural trends influence our role in the development of body image and *ipso facto* body image disturbances (Stice, 1994). These sociocultural developments, which were once predominantly manifested in later teens, are now affecting younger children, and adolescents. Studies have shown that body image concerns regarding weight and body image are a feature in children as young as 5 years old (Davidson *et al*, 2000; Ricciardelli *et al*, 2000). It is rather apparent in contemporary literature that one of the main influences that affect women and adolescent girls is body weight. Our society and culture have created a somewhat paradoxical situation. On one hand we are seeing eating disorders such as Anorexia Nervosa (AN) and Bulimia Nervosa (BN); however on the other hand we are seeing an increase in obesity (Battle & Brownell, 1996). Our social environment gives us access to readily over-consume food, yet women strive for unrealistically thin ideals. More recently men and adolescent males are striving for muscular ideals which may be unachievable to many individuals (Harrison *et al* 2000; Blond, 2008; Leit *et al*, 2001). In westernized society, we observed obesity, body image disturbances, eating disorders and constant worries about

what to eat, along with compelling but unrealistic weight and body image goals (Battle & Brownell, 1996). Nichter & Nichter (1991) looked at what adolescents thought the perfect female body shape should be. The study revealed that the ideal body was perceived to be 5ft 7ins in height, weigh 100 pounds, a USA size 5, and have a BMI of 15.7 (which is classed as underweight). Additionally the female should have long blonde hair and blue eyes. This is simply unachievable, unrealistic and unnecessary; moreover this exposes racial and cultural biases.

The sociocultural theory is the most strongly associated and supported theoretical reasoning behind the increasing high levels of body image disturbance, eating abnormalities and dissatisfaction. Looking at full or partial bodies of models can cause an increase in body dissatisfaction in females (Tiggerman *et al*, 2004). The gap between the 'ideal' body size and the average women's body size is now more distant than ever, and what is considered ideal is a struggle to achieve in most women.

In addition to society's influences, human nature and sexual selection are vital components to consider. Charles Darwin (1871) noted that some species seemed to be at risk from predation due to their physical characteristics which interfere with their survival. One example of this is the male peacock; this bird has an excessively large plumage. Why would this bird evolve in such a way? Darwin's reasoning to this paradox is sexual selection. He argued that certain physical characteristics evolve because they are reproductively advantageous to a greater degree than any detrimental consequence for them e.g. attracting predators (Darwin, 1871). If we look at attraction from an evolutionary stand point, attraction functions on two levels. First, same sex competition for a mate: the more attractive you are then the more likely other females will feel threatened. Second, the purpose is to attract the highest valued mate within your social domain.

Attraction advertises oneself: we need to advertise ourselves in order to gain a mate for procreation. Sexual selection is the trait which enhances successful warning to rivals and attracts oneself to appropriate partners (Darwin, 1871). An example of this advertisement would be a silverback male adult gorilla. The silverback promotes himself by proclaiming a high social status, which is very appealing to females. The gorilla may do this by displaying his protective abilities to the females by warding off other males and showing vigorous threat displays. This demonstrates to the females that they would be protected by an alpha male. The high social status also contributes to other qualities. High social status would indicate that the male would provide security and access to food (Schaller, 1963).

We know that throughout human history, beauty and its enhancement have been desired. Beauty, and improvements to our beauty through cosmetic surgery, could be linked to a higher purpose such as sexual selection and reproduction (Buss, 1989; Sarwer *et al*, 2003).

In human mate selection there are both biological and social variables to consider. In simple terms, we communicate our potential value to a prospective partner, and in return, seek to obtain the most desirable mate by looking for their most desirable features (Barber, 1995). There are a number of theories on attraction and what makes people attractive to the opposite sex. Fritz Heider (1958) claimed that there was a 'balance theory', whereby individuals who are attracted to one another share similar commonalities and characteristics. This then results in a balanced system and inevitably positive feelings and emotions, contentment and happiness ensue. However, if the individuals are unbalanced then the direct opposite result and the outcome will inevitably be inharmonious and psychological discontent (Heider, 1958). Another theory of attraction is termed the Reciprocity Principle. Newcomb (1956) theorised that

‘attraction breed’s attraction’. His research found that just the sheer thought of someone finding you attractive makes the attracter more attractive to the person he or she is pursuing (Newcomb, 1956).

Within the constraints of a dissertation we would never do justice to a more than superficial examination of beauty and attraction. Therefore we are confining ourselves simply to the issues of physical attractiveness and how these influence our perceptions and attitudes towards our own body image, and that of others. A central tenant of this work will relate to how humans have used obvious (i.e. cognitive and behavioural) techniques to adjust their appearances in order to influence sexual selection. Thus we ‘mould’ ourselves in a cognisant fashion rather than having characteristics via only purely evolutionary means. The perception and attitudes of beauty and attractiveness are, in part, learned or experienced through media, cultural and social instruments. If physical attraction and beauty do play a role in increasing our chances of procreation, then how we mould our exterior may be a subjective advantage to gaining a preferred mate (Buss, 1989).

Dion *et al* (1972) published a report based on how a person’s physical appearance and gender identity is the first characteristic accessible to others. The study focused on whether attractive persons (both male and female) are assumed to have more pleasing personality traits than physically unattractive people. The questions asked were whether attractive subjects were deemed to have better lives, better partners, be better parents, and achieve greater success. A preliminary study was first conducted in a sample of 100 undergraduate students who were asked to rate photographs (the photographs selected were from a year book). These photographs were categorized into varying levels of attractiveness. In the study 30 female and 30 male students were asked to rate 3 photographs: unattractive, average, and attractive people. The experimenter’s findings

indicated that attractive people were assumed to be more socially accepted and had more pleasing personalities. The raters assumed the attractive people would have better jobs, happier marriages, be better partners and enjoy more gratifying social and occupational lives (Dion *et al*, 1972).

These generalized beliefs that personal characteristics are somehow interlinked with physical attractiveness is called the 'halo effect' and this was initially theorised in 1920 by Edward L. Thorndike. Thorndike identified a constant error in psychological ratings due to the halo effect. He noted that estimates of the same man were highly and evenly correlated when subjective ratings were given by superiors regarding staff. This was initially highlighted when Walter Dill Scott asked a flight commanding officer to assess his 137 aviation cadets with independent ratings scales on physical qualities, intelligence, leadership and personal qualities. This was further backed by Thorndike who showed similar results from two large industry corporations. Thorndike illustrated that superiors did not view the subject's nature along with achievements independently, but rather gave their subjective assessment in a generalized capacity, in terms of either good or inferior. This tainted the true attributes of the subjects with this personal feeling (Thorndike, 1920). Further research on the halo effect done by Solomon Asch (1946) showed that people form opinions from particular core traits. Therefore a less attractive person will be unattractive on all core personality traits. The more attractive the individual, the more attractive all core personality traits will be (Asch, 1946). People's perceptions of others and the implication that 'What is beautiful is good' and sexual selection seems to influence our perceptions greatly.

From an evolutionary psychological standpoint, sexual selection requires the mate to choose a partner based on the most preferentially attractive characteristics which evolution has deemed desirable (Bergstorm, 2004). In studies, males have indicated that

they choose a partner based on reproductive ability, and that a pleasurable appearance is a sign of good reproductive ability (Buss 2007; Buss, 1989). Other favourable characteristics are fertility and youth. Donald Symons (1979) shows evidence that the importance of facial attractiveness reduces over time and is superseded by fertility and health of partners. Young females with features that include evenly coloured, smooth supple skin, good muscular tone, healthy clear eyes, healthy hair and fuller lips are preferred when seeking a mate. Youthful relevant behaviour is also considered highly desirable, youthful personality, higher energy and energetic mannerisms have been associated with the most fertile reproductive capacity. These signs all show as attractive qualities and indicate a disease free person (Symons, 1979).

The Mate Selection Project, studied 10,046 people across 37 different cultures over 6 continents (and included 5 islands), and showed that youthful individuals were seen as attractive. "In no known culture do people perceive wrinkled skin, thin lips, poor muscle tone, and irregular facial features to be attractive" (Buss, 1989).

Another trait which has been studied in evolutionary psychology, which contributes significantly to reproductive value, is low waist to hip ratio. Singh (1993) reported that men preferred lower waist to hip ratios. Body types of Playboy centrefolds' have long remained the same, with the models 'waist-to-hip ratios being around 0.7. Although the models over the years have become thinner, the overall waist to hip ratio has remained the same as shown in figure 1.1 (Singh, 1993). Figure 1.1 highlights women's varying waist to hip ratios which range from 0.4 to 1.0. The illustration has been used in previous studies; in particular this illustration was used in the Hadza versus US experiment. Hadza men were asked to rate the figures in the illustration. Hadza men are hunter gatherers who reside in the mixed-savannah woodland of Tanzania. When the results of the Hadza men were compared to the US men it was shown that the US men

preferred a waist to hip ratio of 0.7. The Hadza men preferred heavier women and labelled skinnier women as sickly (Marlow *et al*, 1999).

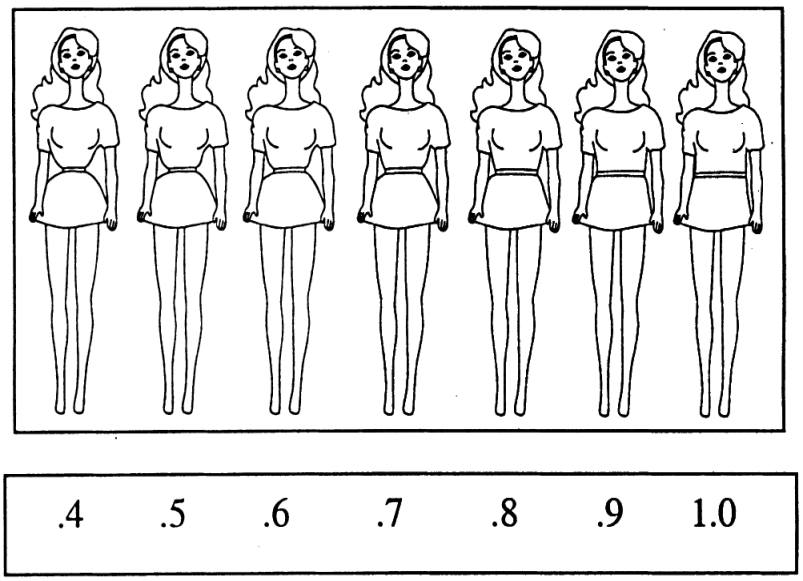

Figure 1.1 Shows an illustration which was used in the Hadza vs US Experiment in 1998. The illustrations of the female bodies range from a waist hip ratio of 0.4 up to a waist hip ratio of 1.0. (Marlow et al, 1999).

However, this low waist to hip ratio is not a universal standard, but is characteristic of the developed world. Western females have elevated levels of oestrogen, which causes fat distribution to accumulate on the hips and buttocks rather than on the waist (Singh, 1993). Women who do not fit into the waist to hip ratio range and have higher waist to hip ratios, or have apple shapes, exhibit increased problems such as diabetes and infertility (Singh, 1995). This male preference seems to apply across a number of cultures, and for women to have a low waist to hip ratio seems to be regarded as one of the best and most precise indicators of fertility and health (Singh, 1993; Singh, 1995).

However, all cultures that have been examined seem to have been exposed to the western media. Some of the most isolated places on earth have access to media, cinemas and televisions. That the western media influences our beauty ideals is supported by a story of an unwesternised population in the Manu Park in southwest Peru. Here the

indigenous people, the Matsigenka, have experienced little western media. The study showed that their men preferred waist to hip ratios which were remarkably different to the US control population. Females were initially ranked on weight and then by their waist to hip ratios. The females were then ranked highest under three measures: attractiveness, health and spouse predilection. The data revealed that the males ranked high waist to hip ratios significantly higher than low ratios. Even in studies done on the geographical areas of the Manu Park where the population had been exposed to westernized culture, males still preferred 'overweight' physiques and believed that higher waist to hip ratio females were healthier (Yu *et al*, 1998).

Women appear to adopt a very different strategy when choosing a partner. Men prefer physical attributes more than females. However, while females do consider physical attraction, they favour other features that a mate must possess. In particular, women look to male partners for their ability to protect them and their children, guarding possessions, and displaying commitment to their wives and children (Buss, 2008).

Our culture seems to send an influential message to females suggesting that beauty and being thin is held in high regard and is loved. This ideal image implies that if you are thin, a successful life with prosperity and family will ensue (Hesse-Biber, 2005). As we know, the health of women relies not only on physical wellbeing but also cultural, social, emotional and spiritual consistency. A statement from a college age Caucasian female of middle class status regarding thin ideals said:

"*I think I have to please men, if I want to get a date, if I want to be married, if I want anything, and so how I appear to men is really my final (weight) goal, like if I'm going to be married or be an old maid"* (Hesse-Biber, 2005).

This personal view suggests that body image ideals and the culture to be thin can be a constant focus for some women in westernized societies. Regular awareness of these pressures may in fact influence eating habits and shift values for women. Women therefore may focus on these thin ideals to fit in and conform to the pressures of our society and its current preferences (Hesse-Biber, 2005).

Thin ideals are not the only important factor in sexual selection; facial attractiveness is also very important (Symons, 1979). It was suggested in Darwin's (1871) Descent of Man, that beauty is culturally specific. It is suggested that children learn what is attractive through socio-culture and our media focused society. However, studies have shown high inter-rater reliabilities of judgments on attractiveness transverse race and cultures (Weisfeld *et al*, 1984; Maret, 1983).

This may suggest a common structural standard of attractiveness throughout cultures and race. In a study by Langlois, 3-6 month old infants were shown pictures of attractive and unattractive faces. This was then judged by an adult who scored how long the child looked at the pictures. The results showed that the infants preferred to look at the attractive pictures for longer durations compared to the unattractive pictures. This may suggest that children have innate preferences for attractive faces that precede the effects of media and culture (Langlois *et al*, 1987).

In the 1990's, Langlois looked at what makes a face beautiful. Langlois presented subjects with average pictures of faces that had been created from a population of students and then digitally averaged. Both males and females images were used to create the average face, and the results showed that this composite face was deemed the most attractive when compared to the individual faces (Langlois *et al*, 1990). This suggests that attractiveness may be due to individuals conforming to the evolutionary

pressures, where average traits with no obvious minor distortions are present. This study demonstrated that prototypical faces are deemed by subjects as being more attractive. However, some investigators have said that overlaying images and the procedure which Langlois adopted did somewhat blur the facial features. Distorted sizes and shapes of proportions and elevated symmetry of the composite face could confound the perceivers view (Alley *et al*, 1991).

Some evolutionary studies have looked at how health may be interlinked with attractiveness. Hamilton & Zuk (1982) suggested a parasite model of sexual selection, whereby evolutionary longevity is waged amid combat by the organisms and pathogens. Animals will stave away from other animals that show characteristics of infection, and choose a mate with observable traits that indicate they are pathogen free. This is a common characteristic, which also exists in humans (Gangestad, 1993). Studies by Kalick et al (1998) asked subjects to rate pictures based on attractiveness and then score the health of the pictured individual. One group of subjects scored the attractiveness of the images while an independent group scored the health of the pictured people. The results indicated that adolescent facial attractiveness for both genders seemed related to health. Subjects, who scored the health of the pictured people, believed that the more attractive the subjects were, the healthier they were. The observer's rating of health was higher for the attractive images even when compared to the subject's medical health assessment. This indicates that the subject's attractiveness impairs the ability of the observer to accurately assess the health of the person (Kalick *et al*, 1998).

1.3. MEDIA INFLUENCE & BODY IMAGE

There is extensive research on the impact of media on body image and body image disturbance. With the introduction of television over 60 years ago, family life changed (Coffin, 1955). However, it is important to recognize that the modern media are not the sole mediators of body image and eating disturbances. We have long had an appreciation of beauty and its effect throughout history. However, media do play an ever growing role within our modern day society and evidence of media influence on body image can be seen in many studies (Hoek *et al*, 2003; Ricciardelli *et al*, 2000; Dittmar *et al*, 2009).

The introduction of television brought along with it important information such as news broadcasts, documentaries and educational programs. Television has enabled us to quickly pass on important information to the masses over many countries at any given time of the day (National Media Museum, 2009). This has served as a vital component which has spread world news and other important information without the requirement of additional resources (National Media Museum, 2009). In Britain advertising started on the 22nd of September 1955, and the first ever commercial was for toothpaste by Gibbs SR. The morning after, a Manchester Guardian newspaper journalist wrote:

"*I feel neither depraved nor uplifted by what I have seen…certainly the advertising has been entirely innocuous. I have already forgotten the name of the toothpaste"* (National Media Museum, 2009).

Advertising has become an important business with a yearly turnover of 100 billion dollars in the U.S.A alone in 2001. On any given day people are exposed to 2000 commercials which are an influential force (Kilbourne, 2002).

Researchers have studied and reported on the influence of media and advertisements, TV, cinema, electronic media and print, with regard to body image disturbances in people, primarily women, and its role in eating disorders (Thompson *et al*, 1999; Garner *et al*, 1980).

Undoubtedly its contribution to image-related disorder is complex and why it should have such influence is enigmatic we have developed a growing fascination with celebrity, television personalities, movie personalities and models (Maltby *et al*, 2005; Heinberg *et al*, 1996; Houran *et al*, 2005). Throughout history, significant popular figures such as Churchill, Napoleon and the Monarchies have influenced the masses. These figure heads have been revered, and even worshipped, as heroes. Thomas Carlyle, a Scottish born British historian, wrote some of his most famous work on heroes, and hero worship and his examples ranged from the prophet Mohammed to Shakespeare. He wrote that "*No sadder proof can be given by a man of his own littleness than disbelief in great men*" (Carlyle, 1841). This form of hero worship (of these icons and people of greatness) is in some respect similar to how people worship celebrities today (Carlyle, 1831). However, the difference is that on some platform these heroes contributed significantly to society in one way or another. We now seem to form hero type worship on celebrities who are devoid of similar accomplishment but are simply popular entertainment figures, such as, actors, actresses, models etc (Houran et al, 2005; Dittmar *et al*, 2009). There is a growing industry (magazines, books and reality TV) dedicated to promoting fame for merely being on television or in films (Tapper *et al*, 2005). McCutcheon *et al* (2002) looked at the range of celebrity types and suggested that there were three distinctive levels of celebrity admiration. These were (Entertainment-Social) low level celebrity worship which was identified by solitary characteristics ("Keeping up with news about my favourite celebrity is an entertaining pastime"); (Intense

personal feelings) which involves social enjoyment and discussion with others rather than a solitarily act ("I love to talk to others who admire my favourite celebrity"); and (Borderline-pathological) the uppermost level of celebrity worship which has obvious obsessive-compulsive features ("I have frequent thoughts about my favourite" celebrity even when I don't want to"; "I often feel compelled to learn the personal habits of my favourite celebrity"). McCutcheon *et al* (2002) theorised an absorption-addiction model of celebrity worship whereby individuals manifest links to celebrities in an attempt to create an identity and develop a sense of personal fulfilment by doing so. They suggest that this process of by attachment formed in this manner is very similar to an addiction.

Media affects not only adults but it also significantly affects children. For example children's play toys include the very popular Mattel brand who market Barbie and Ken dolls. These dolls have made over £1 billion in annual sales with a reported 800 million dolls sold since their introduction in the 1950's (New York Times, 1994). But, do these dolls actually depict realistic (or unrealistic) body ideals? Brownell *et al* (1994) compared a male aged 32, height 6ft 0ins, weight 186lbs and a female age 22, height 5ft 2ins weight 125lbs. Both adults had measurements of their waist; chest, neck circumference and length of neck were recorded. These measurements were then compared to the Ken and Barbie dolls. To attain the necessary body proportions depicted by the doll the female would have had to increase her height by 24ins, reduce her waist size by 6ins, increase her chest by 5ins, reduce her neck circumference by 0.2ins, and increase her neck length by 3.2ins. For the male, all measurements had to be increased including height of 20ins, waist 10ins, chest 11ins, neck circumference 7.9ins and neck length 0.8ins. Dittmar *et al* (2006) showed that Barbie dolls do influence girls' body image perception. In a study on 5 to 8 year olds, who were shown images of an Emme doll (which is based on a popular plus size supermodel and is proportionate to a

US size 16), a Barbie doll and a control (which was no doll image). They were then asked questions about body image the girls exposed to the Barbie doll expressed lower self-esteem and an increased desire to be thinner. Older children did not show this response to the Barbie doll. However, younger children were influenced by the doll's appearance suggesting that it might produce enduring changes in their body image ideals.

It is widely accepted that a primary influence during adolescence is the media, and that adolescents create para-social connections to media personalities (Giles, 2002). These connections can be acute bonds to the character, their appearance and lifestyle, and can form strong para-social connections. This can supply adolescents with similar behavioural characteristics and attitudes to those of that character (Larson, 1995) and can contribute to body image disharmony. Other studies have also highlighted that adolescent female's show body dissatisfaction when asked to compare thin celebrity personalities with themselves (Heinberg *et al*, 1992).

A study by Stice *et al*, 1994 suggested that women's body dissatisfaction increases when recurring thin ideals are portrayed (and ergo promoted) via the media. Media not only influences how thinness is related to beauty, but actively causes negative views of being overweight. This trend places women under pressure to achieve a particular body size and body weight (Stice *et al*, 1994) to achieve the positively valued thinness and avoid the negatively valued overweight condition.

A study by Fouts & Burggraff in (2000) showed that larger female characters in comedy shows were the subject of more negative comments by the male characters often targeting body weight. This was then significantly associated with audience laughter presumably indicating that the humour exists in the failure of the female to

achieve a suitable size and how this would cause her chagrin. This highlights and reinforces, through audience laughter, that disparaging comments regarding body weight of the female characters is acceptable. The grouping of over represented underweight female characters and larger female characters may strengthen weight stereotypes.

Researchers who investigate abnormal eating patterns, such as anorexia nervosa and bulimia, have suggested a link of these disorders with fashion magazines, movies and television (Levine *et al*, 1998). Spitzer *et al* (1999) compared BMI's of 18-24 year olds from eleven National Health Surveys with playboy centrefolds, playgirl models and Miss American Pageant winners from years 1959 to 1999. The results showed that the Miss America Pageant winners had significantly reduced body weights, while the Playboy centrefolds had below normal weights, and the playgirl models appeared to have significantly greater muscle mass none of these groups reflected the wider population of similar aged females. One study by Birkeland (2005) corroborates current research on how media exposure affects individuals. The study assessed if individual mood and negative body image dissatisfaction could be induced by media images. The study compared of four media conditions: these were the presence or absence of a model in the advertisement and the presence and absence of an appearance-related product. The study found that there was no significant relationship between body image and product placement. It did find that the presence of a model in the advertisement induced negativity toward the individual's mood and body image. This report supports the findings of numerous appearance-comparison model experiments. The appearance comparison model has been studied for over a decade, and it indicates that male and female subjects who actively compare their appearance with that of others have a

greater negative body image than those subjects who do not compare themselves to others (Durkin & Paxton, 2002; Groesz, Kevine & Murnen, 2001).

Research to date has shown that the main appearance-related pre-occupation amongst women is thinness. An online study conducted in 2007 by Radio One's Newsbeat and 1xtra's TXU asked 17-34 year olds about their bodies and obtained 25,000 participants they asked about weight related issues and body ideals. Nearly 50% of the females who participated answered the survey stated that they 'starved' or omitted meals at times in order to reduce their weight. The researchers also recorded that nearly 66% of size 14 females considered themselves to be overweight or fat. Approximately 50% of the females commented on areas of their bodies that caused them dissatisfaction and that there were numerous things they would change about their bodies. Sadly more than 10% of the females commented that they hated the way they looked. It was shown that women actively dieted more than men, and that 20% of the women respondents were currently dieting compared to only 10% of the men. Over half of the women indicated that they would consider having plastic surgery whereas only 25% of men replied in kind. The most desired procedures for women were breast enlargement and followed by liposuction. For men, rhinoplasty and liposuction were the most desired treatments. Over 50% of the young female girls (age of 12-16 years) commented on how their body image inhibited them within relationships and prevented them from relaxing in a relationship. This is an interesting perspective considering that male subjects were asked to comment on ultra-thin versus curvy celebrities, and males favoured a more curvaceous look in females.

1.4. PEER PRESSURE

Media and family influences on body image development and adherence are widely accepted and well established following decades of research. However, peer pressure and its effects on body image perceptions have received modest attention. This is rather astonishing in view of the many developmental and clinical studies showing that the adolescent populace attribute substantial value to the beliefs, attitudes and ideals of their peers on any number of issues (Coleman, 1980). Research has shown that young people are more prone to resemble their friends in both their social comportment and in appearance (Berscheid *et al*, 1971; Gondoli *et al*, 2011). These findings suggest that fellow peers are integral to in the development of personality, physical features and behavioural ideals in young people (Coleman, 1980, Epstein, 1989; Thompson *et al*, 2007). This theory is further corroborated by studies on risk taking behaviours such as, drug, alcohol, smoking and antisocial behaviour (Tolson & Urberg , 1993; Matsueda & Anderson, 1998; Kenardy *et al*, 2001; Diedrichs *et al*, 2011). Moreover, given that young people tend to exhibit body image issues and eating abnormalities most prevalently in this adolescent phase, valuing peers beliefs may well be a bonding feature between peers (Paxton *et al*, 1999; Roy *et al*, 2009).

Studies investigating the influences of peer pressure on body image perceptions in girls have shown profound peer influence in body ideals and related behaviours such as food consumption (Paxton et al, 1999; Roy *et al*, 2009). The desire to achieve thin ideals in young females is influenced more potently by peers than other influences including the media, family or male friends (Matsumoto et al 1999; Strahan *et al*, 2006). The way in which young women create these thin ideals has led to two fundamental theories. Friendships form both from the socialization process, and from similarities in

beliefs and behaviours associated with shape and image (Epstein, 1989; Thompson *et al*, 2007). Hutchinson & Rapee (2007) did the first known study in a large cohort investigating similarities in body image beliefs and eating behaviour between girls and their friends entering their teenage years. They looked at the role of peer and social influence on body image and associated eating behaviours. The study was carried out on female adolescents (n=1094), with a mean age of 12.3 years. The study identified 173 friendship cliques and assessed each participant using various body mass index (BMI) questionnaires and subscales measuring weight, body image ideals and weight control behaviours. The findings revealed that with each social clique there were similar eating habits, with regards restraint in extreme weight loss behaviours (EWLB), but found no association with body image concerns. Participants who were categorised by levels of dieting i.e. high and low, along with an active involvement of binge eating and EWLB's could be separated and distinguished on behavioural, physical, psychological factors. Moreover, females who were external to the social clique had higher BMI's, lower self-esteem and expressed concerns about body image. This data supports the notion of interplay between peers and their body image beliefs in creating body image worries. This supports the theory that sociocultural implications are strongly interlinked in forming eating and diet restrictions as a corollary to body image disturbance (Levine & Smolak, 1992).

1.5. BODY IMAGE

Body Image is a complex, and multiplatform state that encompasses physical, psychological and societal influences (Cash *et al*, 2002a; Grogan, 2007). How we look

not only at ourselves but at others, informs our body image perceptions (Cash *et al*, 2002a; Grogan, 2007). Body image concerns cause the individual to internally reflect and evaluate oneself through emotion (Amorose, 2001). Perceptions of oneself incorporate not only visual diagnostics, but psychological constructs. When someone is dissatisfied with their body image, a person adopts a negative attitude towards themselves and articulates this in numerous ways, i.e. through thought, feeling and emotion (Grogan, 2007). Body image is dynamic, flexible and malleable (Roy *et al*, 2010). Factors such as contemporary media influences, and social trends, highly impact on our personal perceptions. This inevitably creates a constant re-invention of one's perception of their body image based on external factors (Grogan, 2007; Roy *et al*, 2010). The modulation of body image ideals includes cognitive and behavioural inputs. For example, behavioural investment is the focus to achieve and preserve one's aspect of a particular body element (Cash *et al*, 2004). Studies have shown that adolescent females who are dissatisfied with their shapes and weights prefer a thinner body figure (Demarest & Allen, 2000; Gardner, Friedman, & Jackson, 1999) Males, by contrast, appear to be generally satisfied with their overall body shape and size, although some may wish to be larger or more muscular (Peixoto-Labre, 2002; Stanford & McCabe, 2005)

Historically, there has been an extensive amount of research on body image ideals and whether or not body image is determined by experience and environment (Cash, 2002). Studies have suggested that we focus extensively on 'thin' ideal in appearance and its interrelationship in the development of eating disorders (Ricciardelli *et al*, 2000). We know that factors such as the media, sexual selection and peer pressure play substantive roles in the formulation of body image ideals, and that the most empirically

supported theory of body image issues and abnormalities is the sociocultural theory (Thompson *et al*, 1999; Heinberg, 1996; Dittmar *et al*, 2009).

1.5.1. BODY IMAGE IN CHILDREN & ADOLESCENTS

It has been demonstrated that infants innately prefer to gaze at and interact with, people with attractive rather than unattractive features. Children as young as one year old prefer attractive females over unattractive females and will gaze at attractive females longer than unattractive females (Langlois *et al*, 1987). Studies have documented that infants prefer to interact, play and have an overall unequivocal positive tone to visually more attractive, compared to unattractive, people. In a further study, Langlois found that one year old infants had a preference to play with prettier and more attractive dolls rather than unattractive dolls (Langlois *et al*, 1990). Furthermore, infants preferred to look at more attractive faces across genders, race and age. Collectively this research contends that infants show a predilection (i.e. innate) towards attractive appearances prior to the effects of socialization from external factors such as peers, media and parenting (Langlois *et al*, 1991).

Children are affected by body image concerns and worries, and when they reach middle childhood, these concerns seem to be commonly expressed by many (Hill *et al*, 1994). Increasingly, younger children are expressing concerns regarding their weights (Feldman *et al*, 1988). Boys around the age of 6 to 7 years have indicated a preference for a superior muscular body (Spitzer *et al*, 1999; Leit *et al*, 2001). However, those most affected by body image and body image concerns are females. Women and adolescent females seem to have increased levels of body image concerns (Davison *et al*, 2000).

The concerns include a fear of becoming overweight, exhibit weight loss behaviours such as exercising and restricted food consumption (Davison *et al*, 2000; Flegal *et al*, 2010). Rolland *et al* (1996) studied at 8 to 12 year old children and their perceptions of ideal body sizes and their body mass indices. The study showed that 39% of girls and 26% of boys expressed desires to be thinner from their current level. However, 76% of overweight girls and 56% of overweight boys expressed desires to be thinner. Interestingly, approximately half of the underweight children overestimated their actual body size (Rolland *et al*, 1996). Children are moulded by their immediate family, friends and surrounding environment (e.g. teachers, babysitters); coupled with popular media, these influences appear to have taught the message 'thin' is good and 'fat' is bad (Flannery-Schroeder *et al*, 1996). When 7-11 year old children rate obese children they depict them in a negative light, such as having fewer friendships, not achieving academically, not being particularly liked by their parents, having more tendency to be lazy and unhappy, and are less attractive compared to thinner children (Hill *et al*, 1995). Thus children learn to label themselves and others with these damaging and inappropriate ideals.

1.5.2. BODY IMAGE & EATING ABNORMALITIES

One example of aberrant Body Image and perceptual distortion that arises is Anorexia nervosa. Anorexia nervosa (AN) is a form of body image disturbance and is characterized by the refusal to maintain body weight, fear of weight gain, and concern with body shape (American Psychiatric Association, 1998). The disturbance creates perceptual distortions i.e. over-estimations of body size, or a view that one is abnormally shaped and cognitive dissatisfaction (Rosen, 1990; Walsh & Delvin, 1995;

Gondoli *et al*, 2011). A study by Sachdev *et al*, (2008), using fMRI scans showed that AN patients had distinct differences in regional brain activity when looking at images of themselves or images of someone with the same BMI as them. Control subjects showed that when looking at non-self-images, showed activation in the mid and inferior frontal gyri, superior and inferior parietal lobules, and posterior lobe of the cerebellum and in the thalamus. The AN patients also showed this activation patterns when looking at non-self-images, but showed higher activation within the medial frontal gryus. When both groups were assessed using images of themselves. The control subjects showed higher activation within the mid frontal gyri, insula, precuneus, and optical regions, compared to AN patients who showed minimal activity. These results indicate that AN patients see non-self-images as do control subjects but show decrease processing when seeing themselves, leading to distorted perceptions (Sachdev *et al*, 2008).

Other studies have shown selective activation in the right amygdale, right gyrus fusiformis and in the brain stem of AN patients shown images of themselves suggesting that seeing themselves produces fear and anxiety (Seeger *et al*, 2002).

1.5.3. GENDER & BODY IMAGE

The increase in men's magazines that focus on male appearance has exposed the otherwise unknown issue of male-orientated body image concerns (Boni, 2002). The increase in advertisements depicting men as sexual objects (Kimmel *et al*, 1999), depict the male body as more visible, trim and muscular (Harrison *et al*, 2000; Leit *et al*, 2001). Men are increasingly conscious of the demands to appear physically attractive, a domain previously restricted to women (Adams *et al*, 2005). Estimates suggest that approximately two thirds of adolescent males are unhappy or dissatisfied with their

bodies (Furnham *et al*, 2005). Recently investigators found that the number of men expressing concerns over their body image has risen 43% within the past 25 years (Pope *et al*, 2000) perhaps related to some notional ideal male body shape. A meta-analysis study by Blond (2008) examined effect sizes from fifteen reports revealing that males express body dissatisfaction have an increased susceptibility towards even greater dissatisfaction about their bodies when shown pictures of idealized model men. Males generally do not appear to be overly concerned with thinness per sé, but they do express concerns about their muscularity. Out of 197 boys and girls who completed a 15-item survey, the boys displayed a higher drive for muscularity. Boys were more likely to attempt to gain weight and muscle mass and the drive to achieve this was due to increase self-esteem and elevates levels of body image satisfaction. There was no relationship between the drive for thinness and muscularity (McCreary *et al*, 2000). It appears as though muscularity is the primary concern in males at present but the general lack of research in this area means this may be subject to change.

The popular media and the entertainment business depict a particular male ideal (Pope *et al*, 2000). This may be one of the reasons why men feel that muscularity is important. A study by Leit *et al* (2001) examined male centrefolds depicted in the popular magazine Playgirl. Over 100 centrefolds, dating from 1973 to 1997, were compared by recording of their heights and weights and estimating their body fat content. Centrefolds' body mass indices (BMI) were then calculated. The results indicate that centrefolds have become more muscular year-on-year over this 25 year span. This coincides with the growing cultural expectations and perceptions that seem to influence males towards achieving this current trend and fuels their desires to be more muscular. It was calculated that the average centrefold model had gained 27 pounds of muscle mass and had reduced their body fat by 12 pounds (Leit *et al*, 2001). Previously

we documented that the halo effect plays an important role in how we perceive people. Lerner in the 70's found that more muscular male body types had been assigned personality traits associated with positive attributes. The study found that a more muscular male body was perceived as conveying to a person as being happier, stronger and more attractive. Thinner, lean and obese people had associated negative connotations, such as laziness and dishonesty. These results were reliable irrespective of class or race (Lerner *et al*, 1972).

Body image concerns appear to affect females more than males and females will express more negatives about their bodies than will men (Feinglold & Mazzella, 1998). Body image awareness emerges and becomes more predominant in adolescence particularly so in females. However, evidence is accumulating and documented that adolescent males are becoming more concerned about their appearance (Hill *et al*, 1994; Spitzer *et al*, 1999). Body Image concerns can be fuelled by a number of external stimuli as well as internal factors. These range from the most widely linked theory to body image that is the sociocultural theory, to media influences, para-social connections, adolescent development, peer and family influences, and sexual selection (Giles, 2002; Heinberg *et al* 1992; Heinberg *et al* 1996; Hill et al, 1994; McCutcheon *et al*, 2002; Spitzer et al, 1999; Kluck, 2010). It is natural for anyone to have occasional concerns about their body images; however when these concerns become obsessive various pathologies ensue including eating disorders (Rosen, 1990) and Body Dysmorphic Disorder. It is worth noting that associated psychopathologies (e.g. depression) may play a co-morbid role alongside body-related issues. Popular co-morbid disorders associated with body image disturbances include: depression, obsessive compulsive disorder, social phobias, and pathological skin picking (Coles *et al*, 2006; Grant *et al*, 2006; Phillips *et al*, 1997).

1.5.4. BODY DYSMORPHIC DISORDER

Body Dysmorphic Disorder, or BDD, is a severe manifestation of body image disturbance and is characterized by a worry about imagined or minor defects in appearance. This results in a clinically relevant, functional impairment (Phillips, 2005; Koran *et al*, 2008). BDD is also known as dysmorphophobia, which in Greek means dys– bad or abnormal, morphe – form (Oxford Dictionary Online, 2008). The first documented account of BDD was attributed to an Italian psychiatrist, Enrique Morselli (1891). Morselli documented 78 patients with BDD and wrote: "The dysmorphophobic patient is really miserable; in the middle of his daily routines, talks, while reading, during meals, everywhere and at any time, he is caught by the doubt of deformity" (cf. Phillips, 1991). Body Dysmorphic Disorder is categorised in the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV-TR), as a somatoform disorder. A somatoform disorder incorporates all the symptoms of a medical problem, but where no obvious medical condition can be identified by a physician. Other disorders within the somatoform category include: pain disorders; somatisation disorder; hyponchondriasis disorder; and conversion disorders (DSM-IV; American Psychiatric Association, 1994).

BDD sufferers generally have either no visible abnormality, or a very slight abnormality, but fixate on some perceived imperfection or grossly exaggerate their trivial imperfection (Phillips, 2005). These fixations cause significant disruptions in social functioning, and patients often show signs of psychological distress (Phillips, 1991; Cororve & Geeves, 2001; DSM-IV; American Psychiatric Association, 1994). BDD affects approximately 1-2% of the population. Otto *et al* (2001) measured the prevalence of BDD in a community sample of 318 women aged 36-44 years, was 0.7% for that particular age range, gender and sample size. The most common areas of concern expressed by BDD patients are the head, body hair, facial features, skin

blemishes, thighs, stomach, breasts and buttocks (Phillips, McElroy, Keck, Pope & Hudson, 1993). Some studies have shown that the majority of sufferers appear to have more than one dysmorphic symptom (Cororve & Geeves, 2001). BDD patients often have other associated disorders: for example patients excessively mirror-check, engage with make-up rituals, or excessively groom for many hours. If these rituals are occurring then patients are often screened for Obsessive Compulsive Disorder (OCD) as well. The growing understanding of media influence on 'the perfect body image' would suggest that the rates of BDD might be on the rise. Rosen (1996) stated that "the unique and core pathology of BDD is a disorder of body image" (p. 154). Body image generally has two distinct elements: first a 'perceptual' component relies on the ability of the person to reasonably evaluate and estimate their body size and associated image. The second element is the 'affective/attitudinal' component which incorporates a person's emotions/feeling they express towards their body image (Slade, 1994). Studies have documented that BDD affects both men and women; although milder forms of body image disturbance have a higher prevalence in women compared to men (Rosen & Reiter, 1996). However, the more severe forms of BDD appear to be equally distributed by gender. A study using 95 men and 93 women with BDD showed that men were just as affected as women in terms of distress caused, but exhibited different body areas of concern. Women are preoccupied with their weight, and hips, and engage in skin picking: women also use camouflage techniques and exhibit comorbid bulimia nervosa more so that males BDD patients. Men preoccupied with hair loss often wear hats to routinely camouflage this. Men also express concerns about their genitalia, and frequently display comorbid substance abuse (Phillips et al 1997). The prevalence of BDD within community samples ranges from 0.7% - 1.1%; although in student samples ranges of 2.2%, to 13% have been reported (Phillips, 2002). Surveys in general inpatient

settings show that approximately 13% of patients suffer from BDD (Grant *et a*l, 2001). Studies on outpatient groups show BDD rates ranging from 8-37% in patients with co-morbid OCD, 8% in major clinical depressives and 14-42% in patients with atypical depression (Phillips, 2002). Some studies suggest that there are genetic factors that influence BDD occurrence. Demonstrably, 8% of BDD sufferers have a family member with a prior diagnosis of BDD. As mentioned previously, BDD has an association with OCD; moreover studies have shown that 7% of BDD patients have a first degree relative with OCD (Phillips *et al*, 1998). Grant *et al* (2006) examined BDD patients for evidence of pathological skin picking (PSP) to see if there was any correlation between the two disorders. Out of 176 BDD patients, 44.9% reported a lifetime incidence of PSP, and 36.9% had concurrent PSP.

1.5.4.1. BODY DYSMORPHIC DISORDER & OTHER RELATED PSYCHOPATHOLOGIES

BDD appears to be associated with other psychopathologies to varying degrees. In this section, I will examine some of the associated disorders that seem closely related to BDD. In one of the largest studies on comorbid conditions with BDD (n=293), the most prevalent disorder was major depressive disorder (MDD) with a 76% lifetime prevalence. Social anxiety disorders (SAD), with a prevalence of 37%, and OCD with a prevalence of 32%, have also been reported (Gunstad & Phillips, 2003). Major Depressive Disorder (MDD) is classed in the DSM-IV-TR as an Axis I – Mood Disorders. Out of all the disorders associated with BDD, MDD appears to be the most highly comorbid (Bilby, 1998; Koran *et al*, 2008). However, little exploration has been carried out into the depressive characteristics of patients with BDD. One of the initial

studies Morselli (1891) commented that BDD patients seemed to be "veritably unhappy". Social Phobia (SP) is classed in the DSM-IV as an Axis I Disorder. DSM-IV notes that SP is more likely to present after a traumatic event, and this event may not be recognised on a conscious level. SP symptomatology includes acute intense anxiety, and panic, which may be associated with an activity or event. The diagnosis of SP must include evidence of its interference in normal daily functioning; an example of this would be an individual resigning from their current employment because of an inability to use the elevator (DSM-IV). Coles *et al* (2006) looked at the relationship between SP and BDD. The study included 178 BDD patients of whom 39.3% comorbid lifetime prevalence with SP, which suggests that the comorbidity of SP with BDD may in fact, is more frequent than OCD with BDD. Furthermore, out of the 178 patients, 34.3% currently had SP. Willhelm *et al*, (1997) found that in all surveyed cases of BDD the inception of SP consistently preceded the onset of BDD. Furthermore in a cohort of BDD patients the inception of SP preceded the onset of BDD in 60% of the subjects and 18% of the patients were diagnosed with BDD in the same year (Gunstad & Phillips, 2003).

However, there are some notable differences for BDD and SP patients where the disorders are not co-morbid. For example SP sufferers have a lower employment rate than do BDD sufferers (Coles *et al*, 2008). Obsessive Compulsive Disorder is also classified in the DSM-IV an Axis I Disorder. Both psychological and biological factors have been identified in OCD. The main elements associated with OCD are: obsessions, which are often unrelenting, and sometimes illogical, and unmanageable thoughts. The compulsions often result in actions which the patient manifests in order to diminish the obsessions which alleviates their anxiety. For these conditions to be classed as a disorder they must show evidence of interference in normal daily functions. An example

of an OCD would include constantly checking and rechecking that a cooker is turned off. The relationship between BDD and OCD disorders still remains somewhat enigmatic. BDD could be viewed as an OCD; although research has treated BDD and OCD separately. There is still further research required to ascertain if BDD should be included under the umbrella of OCD. Phillips *et al* (2007) looked at the direct relationship between BDD and OCD patients and BDD/OCD (i.e. co-morbid) patients. These findings indicated that there are numerous connections between OCD and BDD, in relation to demographic features such as, age of onset, longevity of the infirmity and other variables. The observations that BDD sufferers have inferior personal insight and are more likely to be delusional compared to the patients with OCD argues for these pathologies to be considered separately. Moreover, the lifetime prevalence, for MDD and suicidal ideation is significantly different if BDD or OCD presents as co-morbid disorders. At present it remains pragmatic to consider BDD and OCD as unique and separate disorders.

CHAPTER TWO

2.1. STUDY ONE

2.1.1. OVERVIEW OF STUDY ONE

Study One, gathers information from a non-clinical sample of staff and students opportunistically recruited from the University of Bradford. These participants were asked if they were willing to complete a self-report questionnaire. The questionnaire collected information on demographics, appearance perceptions, cosmetic surgery considerations, media influence, and peer influences with regards to appearance. The questionnaire then asks a series of questions about their concerns surrounding body image issues. These questions ask the participant about their daily lifestyle routines, and if their body image concerns/disturbances render these daily tasks difficult.

People who suffer from a body image concern/disorder whether it be mild, moderate or a severe disturbance find daily routines somewhat difficult depending upon their severity. In turn this can affect various social, occupational and daily lifestyle functioning. The questionnaire gives the participants a selection of various tick boxes to choose from. These were, *not at all concerned, somewhat concerned, moderately concerned, very concerned* and *extremely concerned*. The questions themselves require specific responses as to any preoccupations regarding: appearance concerns; distress or torment regarding appearance; impairments in social and occupational tasks; any important areas of functioning affected due to appearance concerns; interference with social life and its avoidance owing to particular appearance concerns; and physical differences subjects may feel they possess.

Study One gathered this information from a large sample of staff and students (n= 360) at the university of Bradford. The purpose of this study was to try to identify any links between demographics, body image perceptions, and media influences. Furthermore, in order to evaluate the varying degrees of body image disturbances and their impact on the subjects severity was grouped into, *not concerned*, *concerned* or *pathologically affected* and these severity level were compared to those of the clinical population.

The following chapter introduces relevant background information associated with the various questions designed for Study One's self-report questionnaire.

2.2. GENERAL INTRODUCTION

"The image and appearance of the human body" as "the picture of our own body which we form in our mind, that is to say, with the way in which the body appears to ourselves" was the original body image definition proposed by the Austrian psychiatrist Paul Schilder in 1935 (Schilder, 1935). Following many decades of research refinement have further defined body image as "the subjective concept of one's physical appearance. This is based on self-observation and the reactions of others" (The American Heritage Dictionary of the English Language, 2000). Following extensive research it is now accepted that body image is multidimensional, and rather than exhibiting intransigence it is a dynamic self-concept (Grogan, 2007; Cash & Pruzinsky, 1990; Cash, 2005, Marano & Garfinkel, 2006). Roy (2010) divided the multidimensional concept into four fundamental elements these were: a) an attitudinal

component –this is the view that someone is dissatisfied with an element of appearance; b) a perceptual component – this is the true judgment of oneself without regard to body image; c) a behavioural component - how individuals incorporate behavioural patterns in response to others attitudes; and d) a cognitive component- the reality of a person's perception of their body image representation (Roy *et al*, 2012). Therefore, a body image disturbance can be defined as an abnormal or irregular observation of one's physical appearance, and an atypical response to the reactions of others. Body image dissatisfaction has been associated with other psychopathologies such as depressive disorders, and anxiety disorders (Faulkner *et al*, 2001; Stice, 2002). Studies on the elderly show that they express similar ideals regarding body image, as those of the younger population however, perceptions of which particular aspects are important do differ. Collectively, the research to date on body image and dissatisfaction, points to an association with weight and eating disorders, such as anorexia nervosa and bulimia nervosa, and maladaptive approaches to weight management (Roy *et al*, 2009).

Gender, age and ethnicity are important regulators of body image. Jones *et al* (2007) examined body image perceptions and opposite sex figure preferences. The study examined two rural, ethnic, adolescent groups which included; African American, and Caucasian subjects. Females in both ethnic groups expressed a desire to be smaller overall, and had higher rates of body image dissatisfaction compared to the males. The female Caucasian group scored higher for body image dissatisfaction, and had lower ideal figure ratings than compared to the African-American, female group. Furthermore, African-American females preferred bigger males than did the Caucasian females. Both African-American and Caucasian males indicated a prevalence for larger females above that chosen by female subjects to represent their ideal size.

At some point in everyone's life, generally around the adolescent period both, males and females become aware of their bodies. During the adolescent phase both males and females will engage in many activities with their fellow peers; these activities include risk taking behaviours such as drinking and smoking. Adolescents carry out these behaviours to identify their own limitations and establish boundaries which are an essential part of growing up (Coleman, 1980; Epstein, 1989). At this time males and females also become aware of their body images. They develop notions as to what is considered acceptable or unacceptable within their peer groups, and develop preferences for body images that signal sexual attractiveness (Coleman, 1980; Epstein, 1989; Tolson &Urberg, 1993; Matsueda & Anderson, 1998; Paxton *et al*, 1999).

Many studies show that males prefer females with secondary sexual characteristics i.e. breasts and waist-to-hip ratios of approximately 0.7 which indicates fertility (Singh, 1993). Additionally, men will generally seek females who have good symmetry, fuller lips, and clean and even skin tone, and exhibit healthy characteristics such as clear eyes, active lifestyle, good muscle tone and youthful exuberance. Generally males seek younger females as this increases the chances of fertile coupling (Buss, 2007; Buss, 1989; Symons, 1978). Females however, have different criteria for choosing a partner. Females choose a male who offers them stability and protection. Females generally prefer males who have higher status jobs with a good income and also can provide support in order to raise their offspring. Women have been shown to prefer taller men, and do not discriminate against the male's age range generally seeking out slightly older men with more maturity (Buss, 2008).

However, increasing awareness and promotion of desirable body image ideals for men and women create constant tension. Current research suggests that media and peer influence promote pressures for females to be slim, at levels below which males deem

as attractive. In turn males are expected to be more muscular and athletic (Harrison *et al* 2000; Blond, 2008). Socio-cultural developmental theories may explain the increase in body image importance within our society. We develop our perceptions and expectations of what is deemed attractive as a learned behaviour through family, peer groups and media influences (Stice, 1994; Vygotsky, 1978). If we look at demographics and body image concerns we observe that females are more concerned with their body images than are males. Females will show signs of body image dissatisfaction when looking at media sources (Tiggerman et al, 2004). Interestingly, the awareness of body image concerns seems to affect even younger people and children as young as five years old noted to express concerns regarding body image (Davidson *et al*, 2000).

Research shows that body image awareness and concerns are increasingly prevalent in today's society. Mission Australia (2008) showed that body image concerns for Australian males and females, aged between 15-23 years was of far greater importance than drugs, alcohol, depression and suicide. In westernised countries it is estimated that around 40-70% of adolescents are dissatisfied with their appearance (Kenardy *et al*, 2001; McCabe *et al*, 2001; Diedrichs *et al*, 2011).

2.3. COSMETIC & PLASTIC SURGERY PROCEDURES

We have seen an increase in the rates of cosmetic treatments and plastic surgery procedures over the past decade, and many reasons have been offered as explanations. It is likely that media pressure and the emphasis for people to look a particular way has fuelled the rise in cosmetic and surgical procedures to enhance opposite sex

attractiveness. Demand for these treatments makes these treatments more readily available and specifically designed to enhance, change and advertise body enhancement. The American Society for Aesthetic Plastic Surgery 2008 (ASAPS) reports a significant increase in the rise of surgical and non-surgical procedures to alter appearances as shown in figure 2. 1 over the last 15 years.

Top 5 Surgical Cosmetic Procedures in 2008.

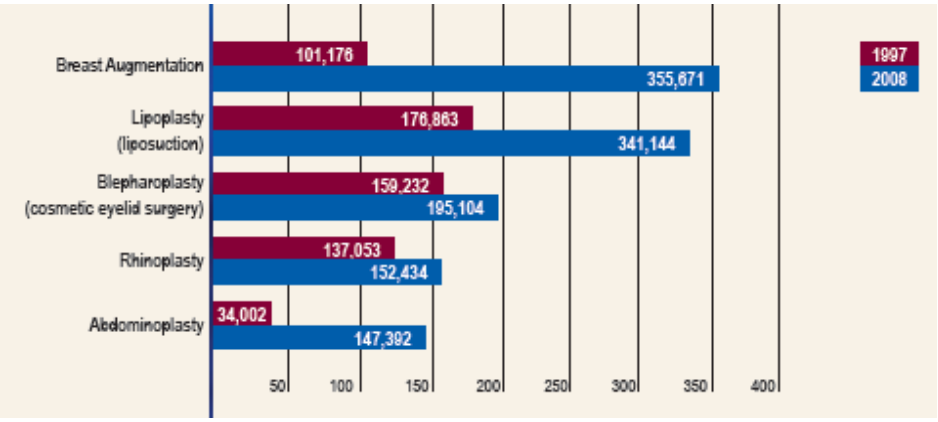

Figure 2.1 The above graph shows the increase in the top 5 cosmetic procedures from 1997 to 2008 for both males and females. Source: American Society for Aesthetic Plastic Surgery, 2008.

The ASAPS has also reported a significant increase in men having cosmetic surgical procedures. The top 5 most common surgeries in 2008 for men were Lipoplasty, Rhinoplasty, Blepharoplasy, Gynecomastia and Hair transplant. For women the top 5 most common cosmetic surgeries were Breast Augmentation, Lipoplasty, Blepharoplasty, Abdominoplasty and Breast Reduction. However, one of the most interesting rises is in the non-invasive or minimally invasive treatment category as can be seen in figure 2.2.

Top 5 Non-Surgical Procedures in 2008.

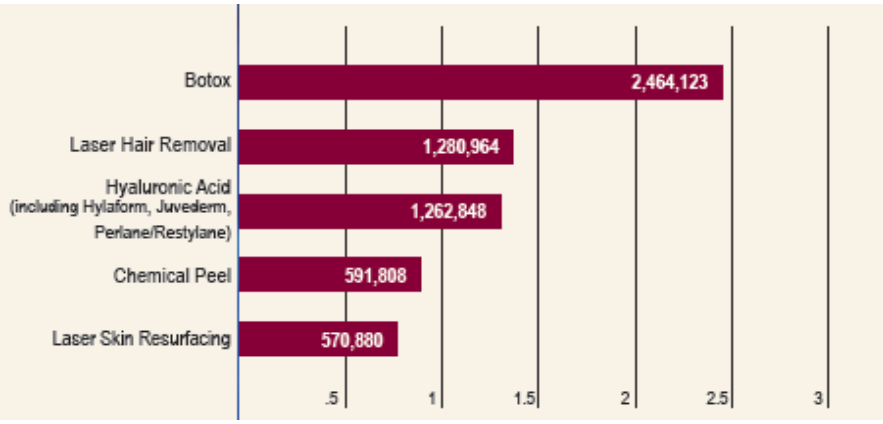

Figure 2.2 The above graph shows the number of both males and females in 2008 that had nonsurgical procedures. Source: American Society for Aesthetic Plastic Surgery, 2008.

Botox treatment as shown in figure 2.2 shows the most significant increase since 1997 to 2008 in both genders. For the male subjects an increase of 4169.2% and for the female subjects an increase of 3638.1% has occurred in the past 12 years (American Society of Aesthetic Plastic Surgery, 2008). This statistical finding is somewhat astounding and may actually underestimate the true data as they do not take into account the ever increasing number of non-medical practitioners who are now offering non-invasive medical treatments (Sarwer & Crerand, 2008). The latest audit figures (February 2010) from the British Association of Aesthetic Plastic surgeons show that the total number of procedures surpassed 36,400 which is a 67% increase from 2008. Male surgeries show a 21% rise from 3,004 in 2008 to 3,623 in 2009. Procedures on women only increased from 5% in 2008 to 2009. The main interventions for men were gynaecomastia reductions which increased from 323 to 581, male brow lifts which increased from 72 to 109, facelifts which increased by 23%, and tummy tucks which increased by nearly 20%. For women breast reductions increased by 3522 to 4122 and there was an increase of 1% for breast augmentation treatments compared to 2008. Rhinoplasty was fashionable with both males and females with a rise of over 25%. Women's facelift procedures did fall by 8%, but increases in brow lifts, eyelid surgery

and Rhinoplasty have been noted. This could suggest that people are seeking alternative skin treatments and rejuvenation procedures (The British Association of Aesthetic Plastic Surgeons, 2010).

2.4. BODY MASS INDEX (BMI)

Body Mass Index (BMI) is a mathematical calculation that assesses an individual's weight and height. The BMI formula is a simple calculation with BMI= weight or mass in kg/height in $(m)^2$. The BMI was designed to measure the healthy proportional weight of individuals in populations; however it does not measure body fat percentage (Keys, 1972). The BMI essentially is used as an investigative instrument and has been implemented in the use of identifying population based weights (Keys, 1972). The BMI was created by Adolphe Quetelet, a Belgian, mathematician, statistics and sociologist at around the beginning of the 19th century (1830-1850). Occasionally reference is made to its original name the Quetelet Index. It was not until later in the 20th century that the term Body Mass Index was coined by Ancel Keys (1972).

Keys determined that BMI is the paramount proxy in the assessment of body fat ratios based on height and weight in population based studies (Keys, 1972). This has not essentially been carried out as medical professionals and the National Health Service (NHS) readily use this assessment to measure individual's body fat values despite its controversy and inappropriateness (Keys 1972; NHS, 2010). The BMI is used as a guide for body fat indices by medical professionals, to assess the likelihood of fat associated morbidity and mortality from cardiovascular diseases, diabetes and other chronic

illnesses (NHS, 2010). The BMI is a good indicator and measurement of what is perceived as being underweight i.e. <18.5, normal weight (18.5 to 25), overweight (25 to 30) and obese >30. However differences in bone and muscle densities can give confounding BMI results without an individual being overweight or obese.

The BMI has been shown in previous research to be influenced by socioeconomic status, age and gender (Nube *et al*, 1998). In particular BMI has been shown to increase with age in adults. The accumulation of body mass with age has been ascribed to a diet containing high fat and inactive routines and lifestyles (Pattersen *et al* 1994). In a sample of 32,762 Poland residents (Nelson 2002) show that BMI increased in a linear fashion in females. However males tend to have BMI 'fat spurts' in relation to their age. The initial first BMI levels increase in men between 20 to 40 years of age, and then a slower increase is noted between 40 to 60 years. Men appear to have a stepped BMI progression, whereas women's BMI levels rise in a linear fashion. (Najjar & Rowland, 1987).

The World Health Organisation (WHO) does state that BMI values are influenced by gender, age and ethnicity dependent, and that different BMI cut off points are needed for certain ethnic groups. Different ethnic groups have been shown to have different associations between body fat percentage and fat distribution, in particular Asian and Pacific populations (James *et al*, 2002, WHO 2000). The rates of cardiovascular disease and diabetes (type II) occur at lower BMI's in Asians compared to Caucasians (WHO, 2004). It could be argued that the BMI is not genuinely representative in predicting the risk of developing disease states depending on these patients' demographics. The WHO are now looking at waist measurement, BMI, morbidity and health risks as improved indicators in determining possible health risks of certain populations (WHO, 2004). The

National Health Service (NHS) along with the media, schools and education nevertheless focus on the importance of BMI to maintain a healthy lifestyle.

Body Mass Index Chart

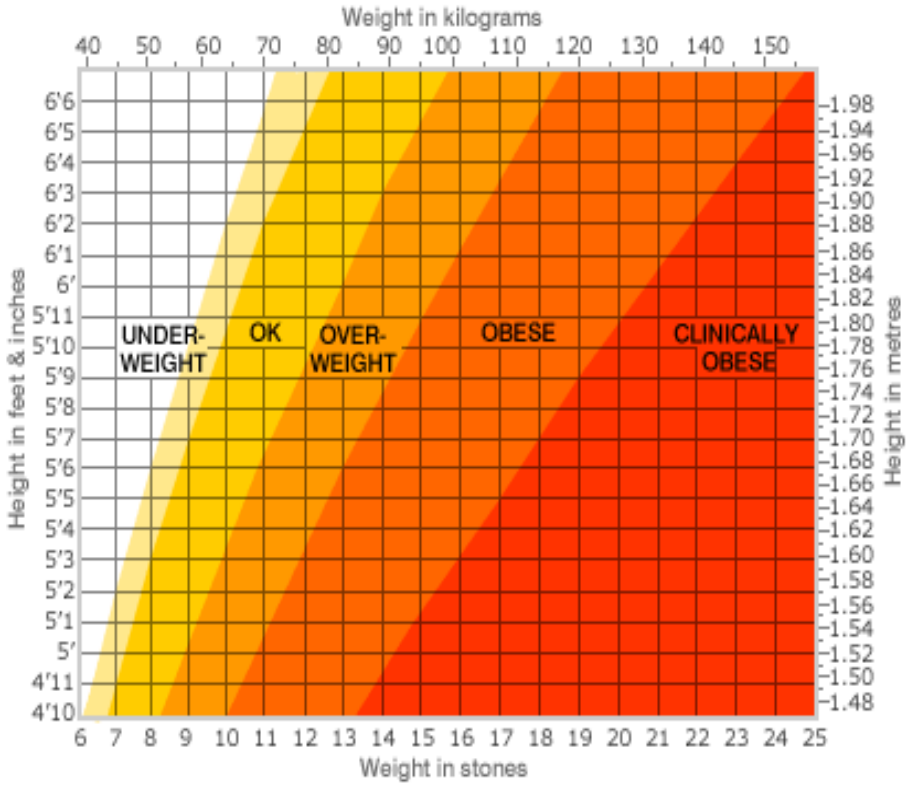

Figure 2.3 Shows the Body Mass Index chart used by Healthcare Professionals (WHO, 2010).

The Body Mass Index chart as shown in figure 2.3 is colour coded and defined by 5 categorical divisions which range from underweight as seen in the white and light yellow section on the left hand side of the chart, to the clinically obese on the right hand side of the scale coloured in red. The table on the next page shows the results from the health survey UK 2007 which measured a sample of the population for BMI from 2003 to 2007. The results show the differences in gender, age range versus weight categories according to BMI as shown in table 2.1.

Males	16-24yrs	25-34yrs	35-44yrs	45-54yrs	55-64yrs	65-74yrs	
Underweight	188	25	22	13	18	8	**2003**
	127	48	37	17	6	0	**2007**
Normal weight	1816	1468	1087	770	639	448	**2003**
	1977	1514	1144	871	626	464	**2007**
Overweight	655	1491	1870	1551	1437	978	**2003**
	766	1326	1920	1420	1479	986	**2007**
Obese	251	633	1008	918	764	578	**2003**
	287	534	1025	1217	946	575	**2007**
Morbidly Obese	13	31	51	48	31	21	**2003**
	18	27	68	80	53	17	**2007**
Females	**16-24yrs**	**25-34yrs**	**35-44yrs**	**45-54yrs**	**55-64yrs**	**65-74yrs**	
Underweight	206	62	38	34	21	19	**2003**
	190	70	32	30	18	25	**2007**
Normal weight	1691	1702	1700	1293	962	503	**2003**
	1686	1723	1680	1271	979	525	**2007**
Overweight	504	929	1320	1067	1161	871	**2003**
	608	795	1420	1083	1138	800	**2007**
Obese	361	595	867	857	831	632	**2003**
	289	606	968	1020	960	682	**2007**
Morbidly Obese	55	98	138	128	73	55	**2003**
	30	69	136	66	78	53	**2007**

Table 2.1 Age categories and number of participants (males and females) grouped in to underweight, normal weight, overweight, obese and morbidly obese.

2.4.1. GENDER, ETHNICITY, BODY MASS INDEX & LIFSTYLE

A study by Yates (2004) reveals that high BMI values are highly correlated with body dissatisfaction in females particularly. Body Mass Index values for different ethnic groups show that white males in the high BMI range are happy with their body image. Filipino males with a high BMI values show results similar to females and express more dissatisfaction. Chinese females who are smaller in body shape and have lower BMI values were happy with their body image, whereas Japanese women who also have a small stature and low BMI were dissatisfied with their body images.

Being overweight or obese is often associated with stigmas and stereotypes given society's prevailing ideals about being thin. This causes pressures and psychological distress for people who do not fit the 'ideal' societal image and persistent exposure to these stigmas leads to anguish and dissatisfaction among overweight and obese individuals (Myers& Rosen, 1999). It has been shown that people who are in positions of trust i.e. medical and healthcare professionals are not resistant to the effects of our socially perceived measure of what is considered attractive and beautiful (Cowen, 1991). Stigmatisation creates prejudice behaviour even amongst medical professionals. The impact of this prejudice on an individual's psychological wellbeing can produce devastating effects on patient's medical professional interaction. This has been shown to result in individuals being reluctant and even avoid healthcare professionals (Myers & Rosen 1999). Studies reveal that 12.7% of women will avoid and reschedule appointments for medical checks if they have had negative experiences because of weight issues (Olson *et al*, 1994).

The stigma of those struggling with weight problems affects social functioning as well. A study by Averett *et al* in 2008 investigated BMI values and relationships. Averett *et al* proposed and explored four hypotheses by which partner choice and

relationships might occur. These are; 1) Selection – the process and application by which we select a mate/partner. They propose that lower BMI individuals are more likely to be selected. 2) Protection - this is where a married adult will have better health due to social support and lower incidence of risky behaviours'. 3) Social Obligation – this suggest that people in relationships may have higher incidence of eating richer and unhealthier foods due to social obligations and roles. 4) Marriage Market – once married, or cohabiting, people may not maintain their lower BMI values since they are already with a partner. These results show that there was no evidence supporting the protection hypothesis. However support for the social obligation and marriage market hypotheses, suggest that both sexes gain increase BMI values with time (James *et al*, 2002, WHO 2000). Carlyle et al (2000) revealed that heavier individuals were less likely to be in relationships although the likelihood was increased with positive features such as an attractive face, good grooming and a desirable personality.

To summarise, body image affects all ages, ethnicities and both genders. It is a changeable concept involving many different social and cultural factors e.g. friendship groups, family influence, media, physical attributes and the perception of others. If people have a distorted perception of their body images then this can lead to other associated psychopathologies i.e. depression, body dysmorphic disorder and eating disorders. Body image appears to be a growing problem within our society. Study One looks at a non-clinical sample of staff and students at the University of Bradford to determine the behavioural correlates and perceptions of body image ideals amongst this cohort.

2.5. AIMS & OBJECTIVES STUDY ONE

2.5.1. AIM

The aim of this research is to explore the relationships between people's self-reported body image and body type, and how these are influenced by media or social groups.

2.5.2. OBJECTIVES

1. To collect demographic information from a sample of students and staff of the University of Bradford in order to inform our decisions on how best to analyse data. Using these results we can categorise subjects by ethnicity, gender, age and so forth, enabling us to treat these as independent variables in subsequent statistical comparisons.
2. To compare and contrast people's body mass indices (BMI), and measure how they vary amongst subjects categorised along their demographic features identified in 1 above.
3. To ascertain how various categories of subjects rate their own self-appearance and body shape, and determine if these ratings are influenced by media and peer conformity pressures.
4. By using different body image assessment questions from different psychometric scales, we will investigate if body image disturbances show commonalities with other appearance-related measures such as Body Dysmorphic Disorder; ultimately we will determine if people who express body image concerns should be seen as having more complex issues.

CHAPTER THREE

3.1. METHODS - STUDY ONE

3.1.1. ETHICS

Ethical approval was granted via the local NHS Ethical Theories Panel, run under the auspices of Airedale General Hospital. Initial drafts of the application were considered via the University of Bradford's internally –constituted Ethical Review for Human Research. The Supervisor of the project, Dr. J. Smythe is a chartered Psychologist of the British Psychological Society and holds a current Practicing Certificate. Under the terms of the charter, research participants must not experience any harm, physically or psychologically and data/personal information must remain confidential.

3.2. DEMOGRAPHICS

All subjects for both studies were recruited at the University of Bradford by opportunistic sampling. Subjects were recruited by advertising, and approached individually to ask if they were willing to participate. The primary recruitment area was the meeting/restaurant area in the main university building. Secondary recruitment areas were the university library, foreign studies library, student union building and around the university sports facility.

3.2.1. UNIVERSITY OF BRADFORD STUDENT & STAFF STATISTICS

Table 3.1 and table 3.2 show the ethnic diversity for the University of Bradford student and staff population. The data reveal ethnic backgrounds at the University of Bradford for 2008/2009 as a % of the total student and staff body.

Ethnic Diversity Students	% of Students
Asian/Asian British	29.8
Indian	6.7
Bangladeshi	1.1
Black/Black British	8.1
African	7
Caribbean	1.1
Chinese	4
White and Black African	1
Asian	0.8
White and Black Caribbean	0.5
White	44.4
Asian	6
Black	2.1
Ethnic	1.6
Mixed	1.4
Unknown	**4.1**

Table 3.1 Percentage of ethnic students at the University of Bradford 2008/2009

Ethnic Diversity Staff	% of staff
White British	70
Black Minority and Ethnic (BME)	20
White Other	7
Unknown	3

Table 3.2 The demographics for all full time staff employed at the University of Bradford from 2008/2009.

Staff number approximately 2000 at the University of Bradford with the highest employment area being academia (36%), Administrative/Clerical (29%),

Managerial/Specialist/Professional (21%), Technical and Manual (7%) and finally senior management (1%).

3.2.2. PARTICIPANT DEFINITION

(a)Inclusion Criteria:

The inclusion criteria were agreed as follows:

1) Males and Females would be included in the study.

2) All ethnic backgrounds were eligible.

3) All subjects had to be legally consenting adults.

(b)Exclusion Criteria:

The exclusion criteria were agreed as follows:

1) Subjects with insufficient English language skills could not be accommodated because we had no interpreters.

2) Individuals who refused to sign the consent form for any reason.

3) Subjects currently under treatment for any mental disorders.

3.2.3. SUBJECTS & SAMPLE SIZE

360 subjects agreed to participate and completed Study One. Subjects for this study were indiscriminately recruited from the students and staff body at the University of Bradford. All subjects were assessed during the period September 2007 – December 2009.

3.2.4. SUBJECT DEMOGRAPHICS

Demographic features of Study One are presented in tables Table 3.3, Table 3.4, Table 3.5 and Table 3.6. Of the total 360 subjects, 1 participants results were discarded from the study because they omitted to state their gender. Female subjects numbered n=180 of the total, while male subjects numbered n=179.

Table 3.3 shows the age range of all participants in Study One is categorised into three groups.

Age Category	Age Range (Years)	% of subjects
Young	18-25	80
Middle	26-40	15
Older	>41	5

Table 3.3 Table shows the age categories assigned within Study One.

Age	Ethnicity	Gender	% of subjects
Young	Caucasian	Male	14
		Female	15
Young	Asian or British Asian	Male	18
		Female	20
Young	Black or Black British	Male	2
		Female	1.6
Young	Chinese	Male	3
		Female	1.4
Young	Did not state Ethnicity	Male	1.6
		Female	3.6
Middle	Caucasian	Male	3.6
		Female	3.6
Middle	Asian or British Asian	Male	2
		Female	1.1
Middle	Black or Black British	Male	1.1
		Female	0.5
Middle	Chinese	Male	0
		Female	0.2
Middle	Did not state Ethnicity	Male	2
		Female	0.2
Old	Caucasian	Male	1.6
		Female	2.5
Old	Asian or British Asian	Male	0
		Female	0
Old	Black or Black British	Male	0.2
		Female	0
Old	Chinese	Male	0
		Female	0
Old	Did not state Ethnicity	Male	0.2
		Female	0

Table 3.4 The ethnicity, age and gender demographics for Study One

Relationship Status	% of subjects
Yes	80
No	15
Did not State	5

Table 3.5 The relationship status for subjects in Study One.

Demographics	% of subjects
Caucasian	41.8
Asian	45.6
Black	6.5
Chinese	4.4
Other	1.4

Table 3.6 The demographics for the participants for Study One.

3.3. QUESTIONNAIRE DEVELOPMENT

In a preceding pilot study, we tested the questionnaire on a randomly selected group of University students (n=20). We initially used a 5 point, Likert rating scale, but increased this to a 10 point scale to increase the resolution between values, for instance subjects might feel obliged to score 2 or 3, but really wished to score 2.5. The questionnaire was amended accordingly from the feedback from the pilot study. Some terminology was reworded to simplify meaning, and we altered expressions which might have caused emotive reactions. In particular, we avoided the use of the word ‘disfigured’ which we thought might alarm some subjects, and because it expresses negativity to some people. We did not wish to influence any subject’s initial mind-set during questioning. Phillips and Hollander (2008) highlighted that words such as ‘disfigured’ can be highly disturbing and may affect participants adversely.

3.3.1. QUESTIONNAIRE

Please refer to Appendix I for Study One questionnaire and consent form. The questionnaire we designed consisted of broad areas of interest. These included:

1) Demographic information on subjects, for example, gender, ethnicity, marital status, sexual preference, weight and height.

2) The second section focused on how subjects rate their appearance, their body, how they compared themselves to friends, if they think they are more attractive than their friends, if they feel pressure from friendships groups, if they feel the media places pressure on them regarding image and what media sources they perceive caused them the most pressure.

3) The third section asked if participants have had cosmetic surgery or if they would consider cosmetic surgery. Also in this section, we asked subjects if they had ever been diagnosed with a mental illness with a comment section asking them to detail what diagnosis was made, and extracurricular activities such as exercise regime, alcohol intake and recreational drug use.

4) The final section focused on body image questions. These questions were formulated and revised from the accumulation of body image identified in this thesis. The questions primarily centred on identification of body image disturbance and body dysmorphic disorder questions. We asked if subjects were concerned with particular aspects of their appearances, which aspect concerned them most, if these preoccupied them, if their physical appearance caused them distress, if they found it difficult in social settings due to their appearance, if their appearance affected their social life, or interfered in their daily lives i.e. work, school, if they actively avoided situations due to their appearance and how much time they spent pre-occupied with their appearance.

3.4. STASTISTICS

Statistical analyses were undertaken in both these studies, correlation matrices, Z scores and analysis of variance (ANOVA) techniques. Dependent data consisted of responses of subjects to individual (Likert – item) or combinations of (Likert-scale) scores, aggregated according to subject demographics. Thus the obvious independent variables were gender (*male/female*), age (*young, mid-age, old*), ethnicity (*white, Asian, black*), marital status (*married, single*) and so forth.

There is controversy and debate amongst statisticians, scientists and journal editors regarding how best to analyse Likert-item or scale data. Traditionalists favour the view that Likert data should be treated as ordinal data, and subjected to non-parametric procedures. Moderate voices believe that the data can be analysed with parametric or non-parametric methods. If the scale is short (1-5 items) and the items are effectively categorised (or actioned) by definite labels such as 'strongly agree, strongly disagree', then subjects responses must be seen as ordinal. We have adopted the view that our Likert scales are 1 – 10 anchored only at the opposite ends, that the steps from 1 – 10 represent interval data at worst, continuous data at best (Norman, 2010; Allen *et al*, 2007) and have followed parametric techniques. One less defined feature of this approach is how does one calculate interactions between two or more independent variables? Opinion here is that it is unwise to use variance-covariance procedures with Likert-data because the 'meaning' of variance for a select Likert-item varies for each question. The accepted view is to simply avoid this confound, and note that if we had applied non-parametric procedures, we also could not determine interactive effects (Norman, 2010; Allen *et al*, 2007).

Where appropriate, post-hoc comparisons for the data have been made using Bonferroni/Dunn corrected t-tests, designed to maintain the experiment-wise alpha level at .05 regardless of the total number of comparisons made. To represent summed averages of Likert-data we have used simple means and variances.

3.4.1. BODY IMAGE QUESTIONS STATISTICAL ANALYSIS

In order to identify levels of body image disturbance within the subjects the body image questions were assigned a numerical value for each answer option. For example, the first question on the questionnaire focusing on body image asks “are you concerned about the appearance of some part(s) of your body, which you consider especially unattractive?” The options available for the subject in order to answer this question were *Not Concerned, Somewhat Concerned, Moderately Concerned, Very Concerned* and *Extremely Concerned.* The numerical values ranged from 0 to 4. The 0 value represented subjects who had no concerns whatsoever about any particular aspect of their body image therefore *Not Concerned* group was assigned 0. The value of 1 was assigned to the *Somewhat Concerned* group as this was the second least concerned value. The *Moderately Concerned* group was given the value of 2, the *Very Concerned* was given the value of 3 and finally the *Extremely Concerned* group was given the highest value of 4. There are a total of seven body image questions which were specifically designed to assess subjects who may have more severe cases of body image disturbance. Therefore the total range of scores for the body image questions ranged from 0 to 24. These were then categorised into three groups. The Not Concerned group where subjects have no particular concerns regarding their body image, the numerical values for this group ranged from 0 to 8. The second group were the Concerned group

where subjects had some concerns over aspects of their appearance but could cope with life reasonably well. The Concerned group values ranged from 9 to 16. Finally, subjects who scored higher than 17 were considered to be pathologically affected as their appearance affected their lives greatly.

3.4.2. STUDY PROCEDURES

Subjects were asked to come to a designated test room, at a time convenient to them, and given a brief introduction and overview to the study and its purpose. If they were agreeable and provided formal written consent, they were given instructions on how to complete the questionnaire. The majority of subjects completed the questionnaire in approximately 25 minutes, although there were no time limits imposed for completion.

Once subjects had finished the questionnaire they were asked to place the completed questionnaire into a separate sealed white box to which we could not gain access until the entire cohort of subjects had completed their questionnaires. This ensured subject anonymity and precluded us from gaining insight into response patterns which might inadvertently be conveyed to subsequent participants. Subjects were briefed using value-free language and expression.

3.4.3. ANALYSIS

Analysis of data was completed using STATVIEW for windows. STATVIEW is a statistical analytical software package. For the analysis some questions were clustered. Age groups were clustered into 3 categories: these were *Young* (18-25), *Mid Age*, (26-40) and *Older Age*, (>41) years old. Sexual Preference was clustered: these were heterosexual and other. The participant identified body areas of concerns on a schematic diagram and 7 clusters were created; face, arms, stomach, chest, leg, buttocks and miscellaneous. Statistical calculations were then carried out on the data, which included frequency distributions, Analysis of Variance (ANOVA), Bonferroni/Dunn post hoc tests and correlation matrices for Study One.

CHAPTER FOUR

4.1. RESULTS - STUDY ONE

4.1.1. GENDER, AGE & ETHNICITY

Figure 4.1 show that out of 359 participants (one omitted due to incomplete data) there were 180 *female* and 179 *male* participants who answered the body image questionnaire. The main proportion of participants were categorised within the *younger* category with (n=288), *middle* category with (n=54), and finally the *older* category with (n=18). Out of the total (n=355) participants (n=5 were omitted due to incomplete data) the distribution of ethnic types amongst these revealed *Caucasian* (n=146), *Asian/British Asian* (n=149), *black/black British* (n=21), *Chinese* (n=16) and *other* (n=23).

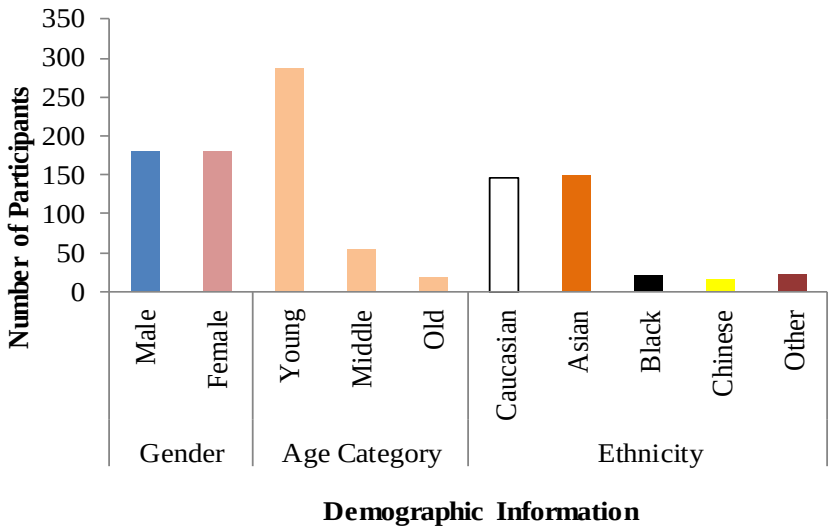

Figure 4.1 Distributions for gender, age categories and ethnicity for Study One participants.

4.1.2. RELATIONSHIP STATUS & PREFERENCE

Figure 4.2 shows that out of 360 participants, 288 subjects said that they were *in a relationship*, 54 stated that they were *not in a relationship* and 18 participants *refused to comment*. Out of the 360 participants, 327 stated that they were *heterosexual*, 21 stated *other* (this consisted of asexual, bisexual and homosexual) and 12 participants *refused to comment* on their sexual preference.

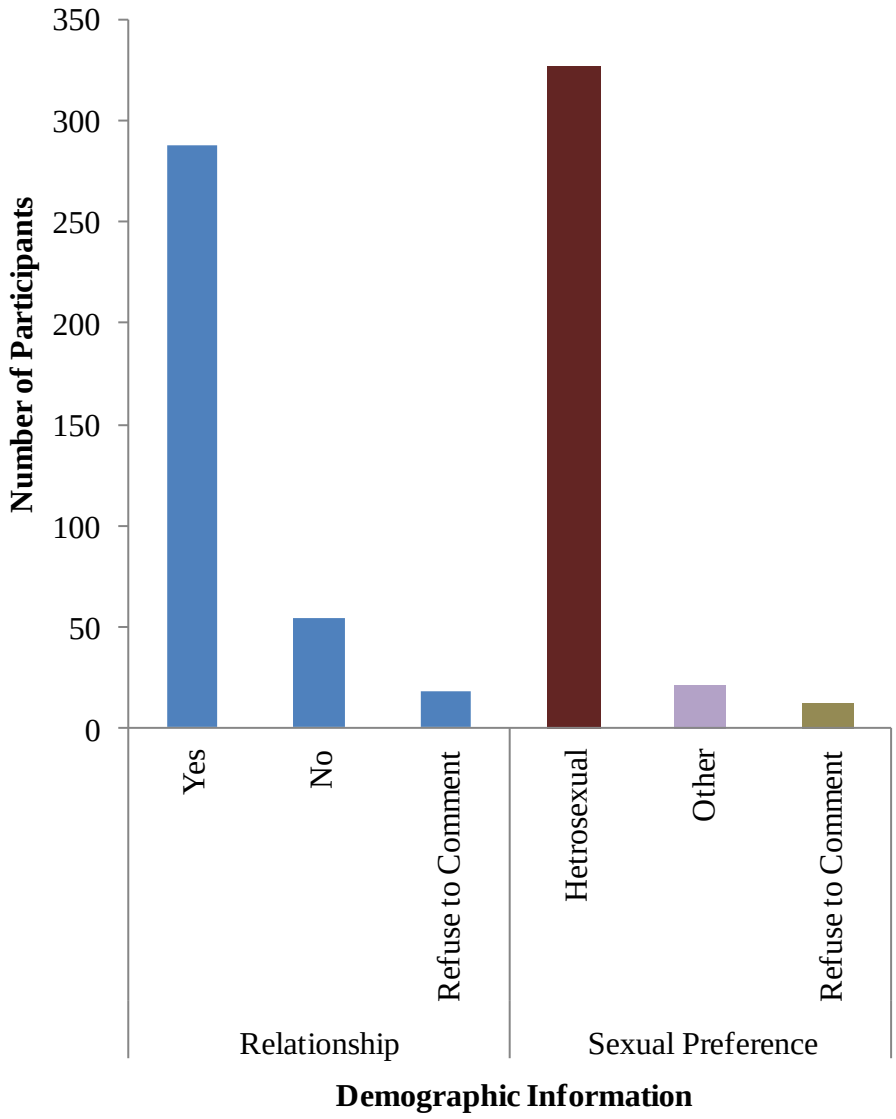

Figure 4.2 Relationship status and the sexual preference frequency distribution for Study One participants.

4.1.3. COSMETIC SURGERY & POSSIBLE COSMETIC SURGERY

Figure 4.3 shows that out of the 359 participants who completed the section on cosmetic surgery (n=1 subject omitted due to incomplete data), 10 subjects said that they *have had a cosmetic surgery procedure*, 349 said that they have *never had a cosmetic surgery procedure*. When participants were asked if they would *consider having a cosmetic procedure* 39 subjects said that *yes* they would consider having a cosmetic procedure, 281 said that they *would not consider having a cosmetic procedure*, and finally 40 said that they *would maybe consider having a cosmetic procedure*.

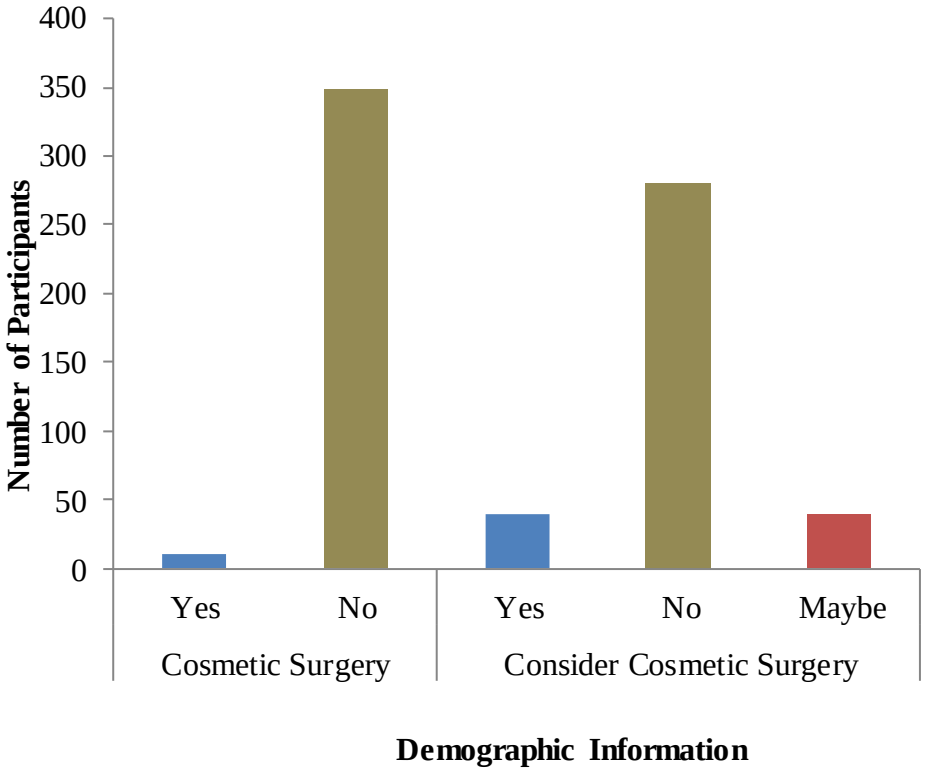

Figure 4.3 Distribution of participants who have had cosmetic surgery and participants who would or would not have cosmetic surgery.

4.1.3. MENTAL ILLNESS

Figure 4.4 shows that out of the 360 participants, 41 subjects stated that they *have had a history of mental illness*, 317 stated that they have had *no history of mental illness* and 2 *refused to comment* on if they have had any prior history of mental illness.

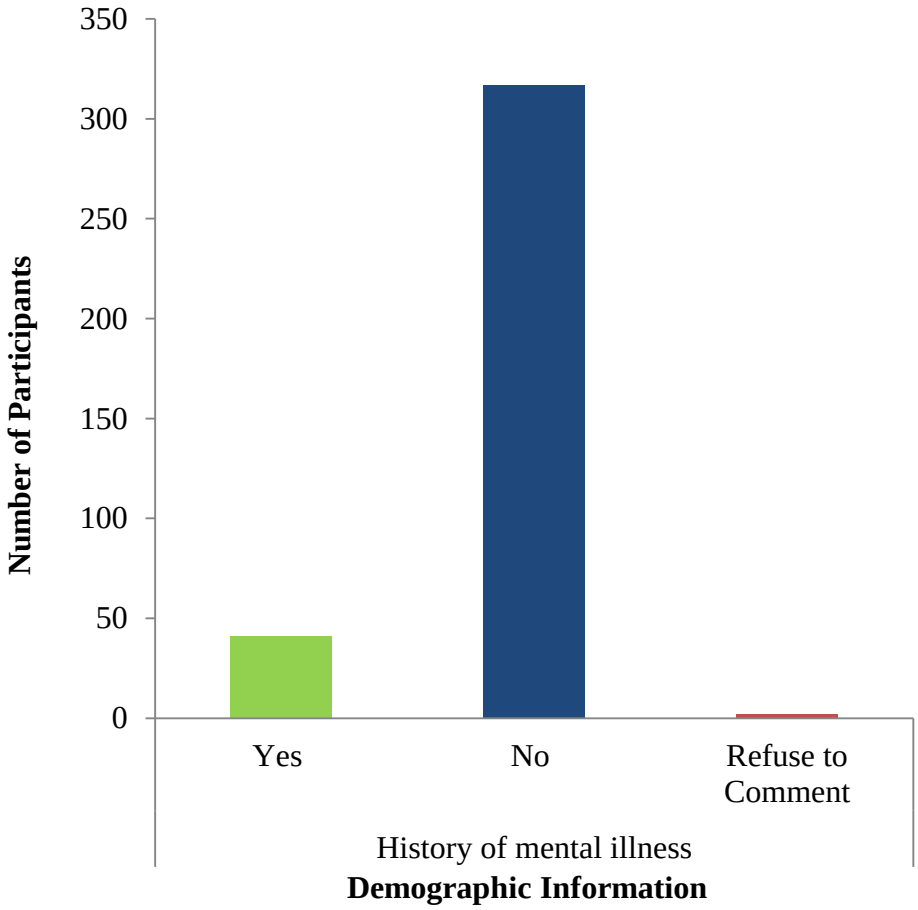

Figure 4.4 Distribution of participants who have or have not had a history of mental illness.

4.1.4. EXERCISE

Figure 4.5 shows that out of the 359 participants with (1 omitted due to incomplete data) 205 subjects stated that *they exercised*, 149 stated that they *did not exercise* and 5 *refused to comment* on their *exercise* regime.

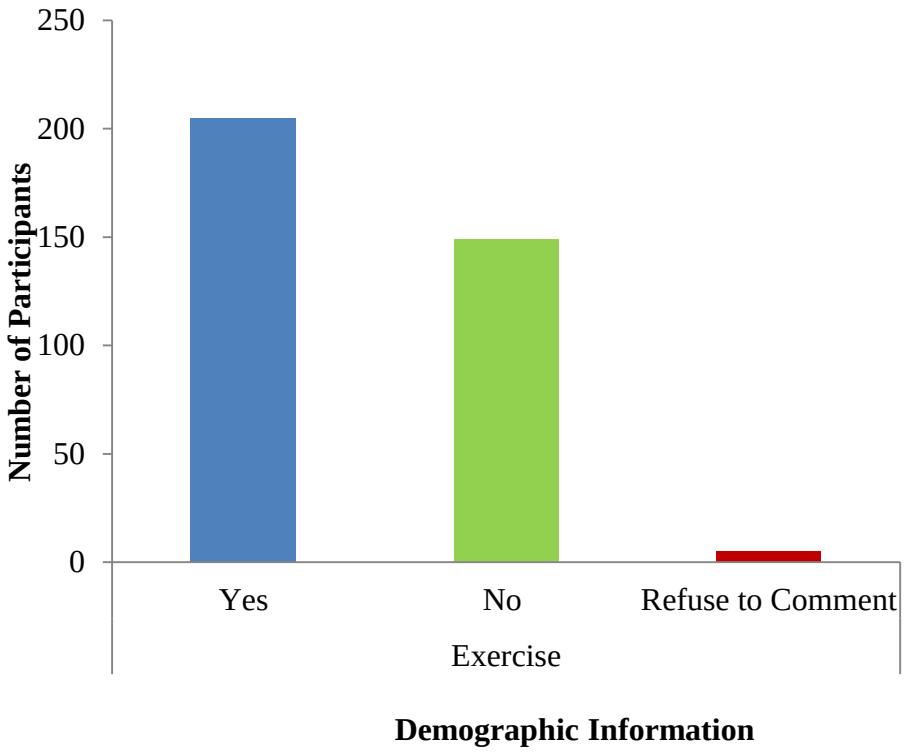

Figure 4.5 Distribution of participants who do and do not exercise.

4.1.5. SELF BODY RATING, AMOUNT OF TIME SPENT CONCERNED ABOUT THEIR APPEARANCE & COMPARISON TO FRIENDS

Figure 4.6 asks participants to rate their physiques from a series of categories ranging from *lean, muscular, fat*, and *refuse to comment*. Out of the 360 participants, 195 said they had a *lean* physique, n=88 stated *muscular*, 68 *fat* and 9 *refused to comment*.

Participants were asked how much time they spent concerned about their appearance. Out of the 360 participants, 306 said *low* concerns, 35 stated *medium* amount of time concerned, 8 indicated a *high* amount of time spent concerned and 11 *refused to comment*.

Participants were asked if they compared themselves to friends with regards to their appearance. Out of 281 participants (79 omitted due to incomplete data) 94 subjects stated that they *always* compared themselves to friends, 106 subjects stated that they *often* compared themselves to friends, 52 subjects *occasionally* compared themselves to friends and 29 subjects *rarely* compare themselves to friends.

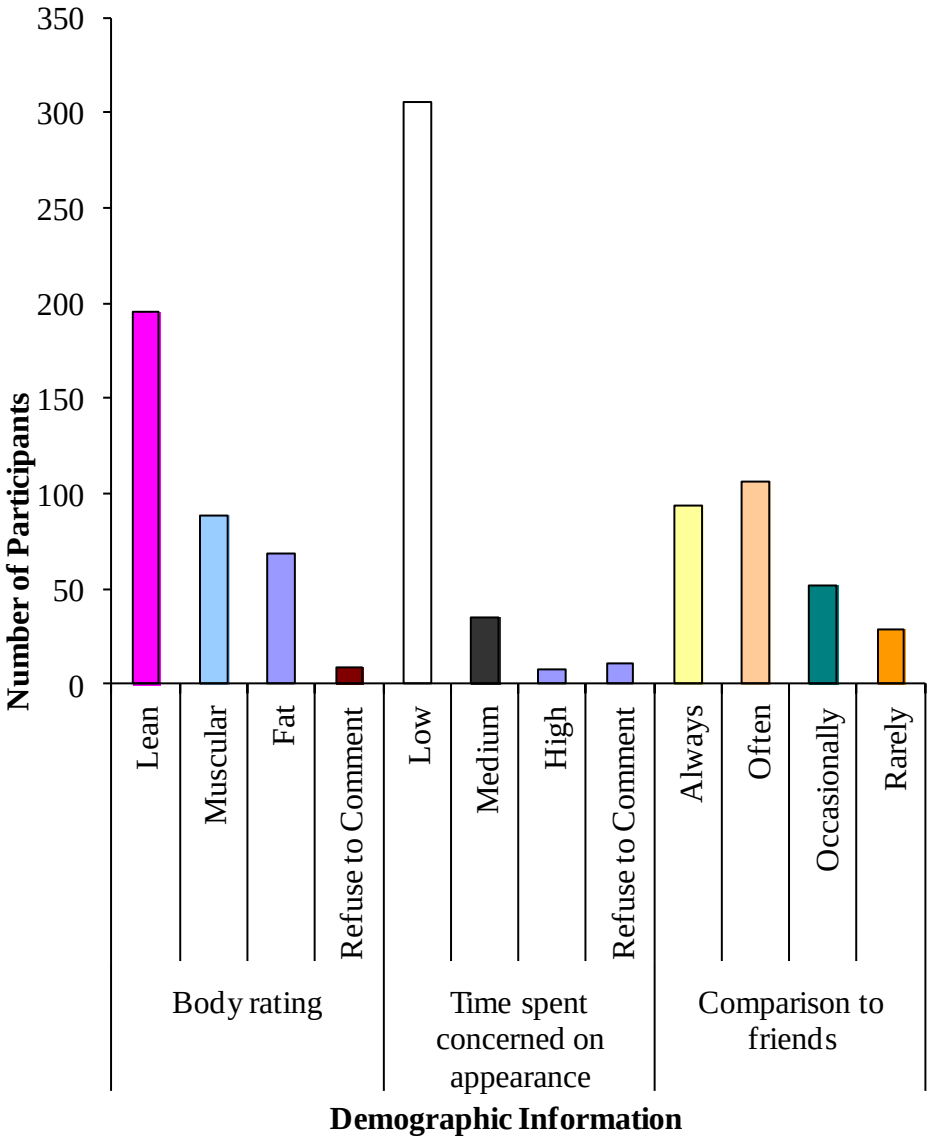

Figure 4.6 Distribution for body image rating, time spent concerned on appearance and comparison to friends.

4.1.6. RECREATIONAL DRUG USE

Figure 4.7 shows that out of 360 participants (268 were omitted due to incomplete data), 37 subjects stated that they *regularly* use recreational drugs, 25 stated that they *sometimes* took recreational drugs, 17 stated that they *rarely* use recreational drugs, and 13 stated that they had participated in taking recreational drugs *one* time.

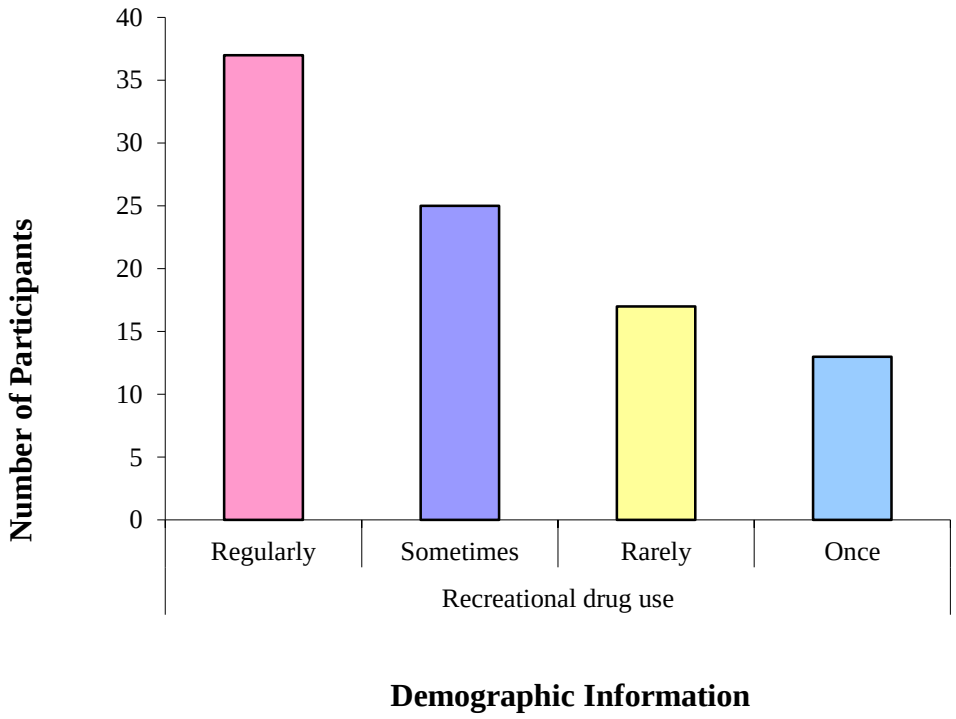

Figure 4.7 Distribution of participants who have regularly, sometimes, rarely and only one time participated in recreational drug use.

4.2. BODY IMAGE CONCERNS & GENDER

Figure 4.8 depicts which body parts caused concerns for participants, broken down from the total participant pool into *females* and *males* categories. The overall general body part concern was the *stomach* followed by *legs, face, arms, buttocks, miscellaneous* and finally the last concerned area is the *chest* for the overall group. For *females* the *stomach* area was the highest area of concern followed by *legs* then *face, arms, buttocks* all had similar responces and finally *miscellaneous* and *chest* had the least amount of responses. For *males stomach* area was the highest area of concern followed by *face, miscellaneous, chest,* finally *arms, buttocks* and *legs* were the least likely body concern areas.

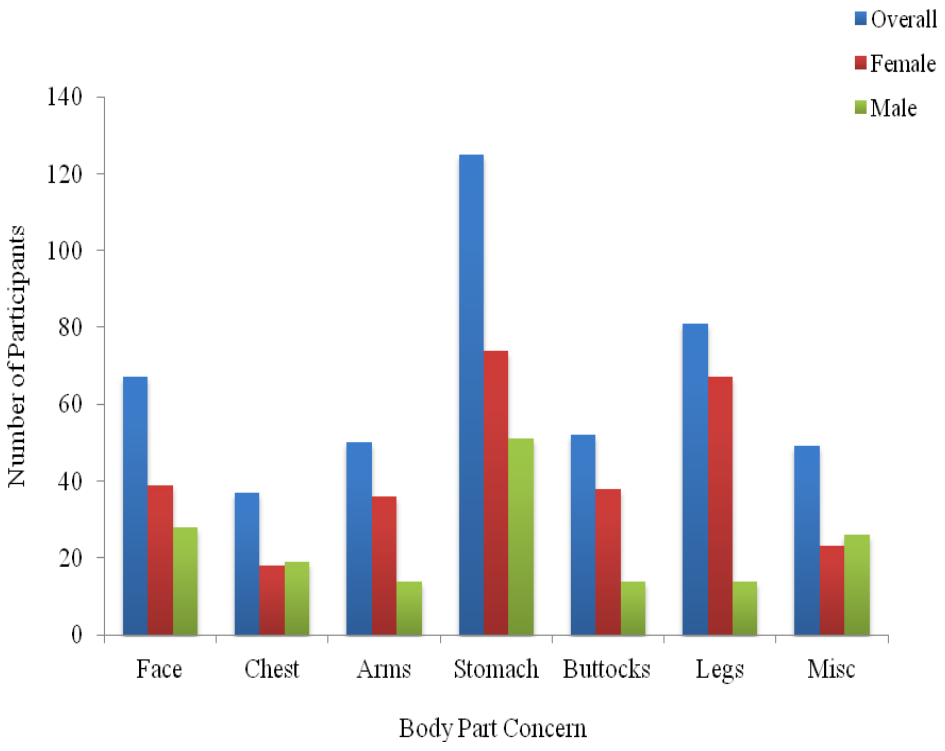

Figure 4.8 Distribution of participants with regards to the body parts that caused greatest concerns. Scores for all participants are shown and then the are subdivided into female/male participants. Subjects could select as many body parts as they wished and were not asked to rank body parts in order of concern.

4.2.1. BODY IMAGE AREAS & BODY MASS INDEX

Figure 4.9 shows the relationship between *body image areas* of concern and their *BMI* values. Participants who said *arms* were their main area of concern showed a higher *BMI* value than subjects who had *no* concern about their *arms* ($F(1,324)=32.793$ $p<0.05$. Participants who stated that their *stomach* was their main area of concern also showed a significantly higher *BMI* than those who were not concerned with their *stomach* area ($F(1,324)=4.116$ $p<0.05$. There were no other significant effects for and of the other *body image areas* of concern and *BMI*.

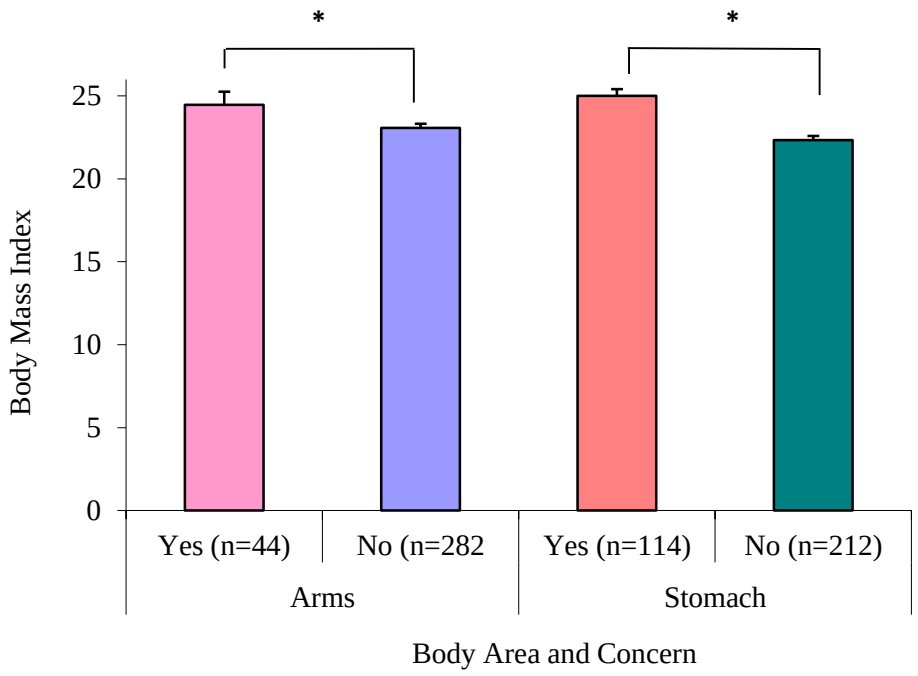

Figure 4.9 The mean ± SEM for body area of concern and the participants BMI values. 'Yes' responders were those who were bothered by that body parts, while 'No' responders were those that expressed no problem with that body part. * Significantly different as assessed by Bonferroni/Dunn test p<0.05.

4.2.2. GENDER, AGE & BODY MASS INDEX

Figure 4.10 shows the relationship between *gender, age* and *BMI*. ANOVA performed on the data for *gender, age* and *BMI* revealed a significant main effect of sex $p<0.05$. *Females* were found to have lower *BMI* scores than *males* with a signifcant outcome ($F(1,321)=3.939$, $p<0.05$, with the data collapsed for the *age* categories.

Age categories and *BMI* also revealed a significant effect. *Age* categories grouped by *young, middle* and *older* tested against *BMI* scores revealed a significant effect with ($F(2,321)=6.295$, $p<0.05$.

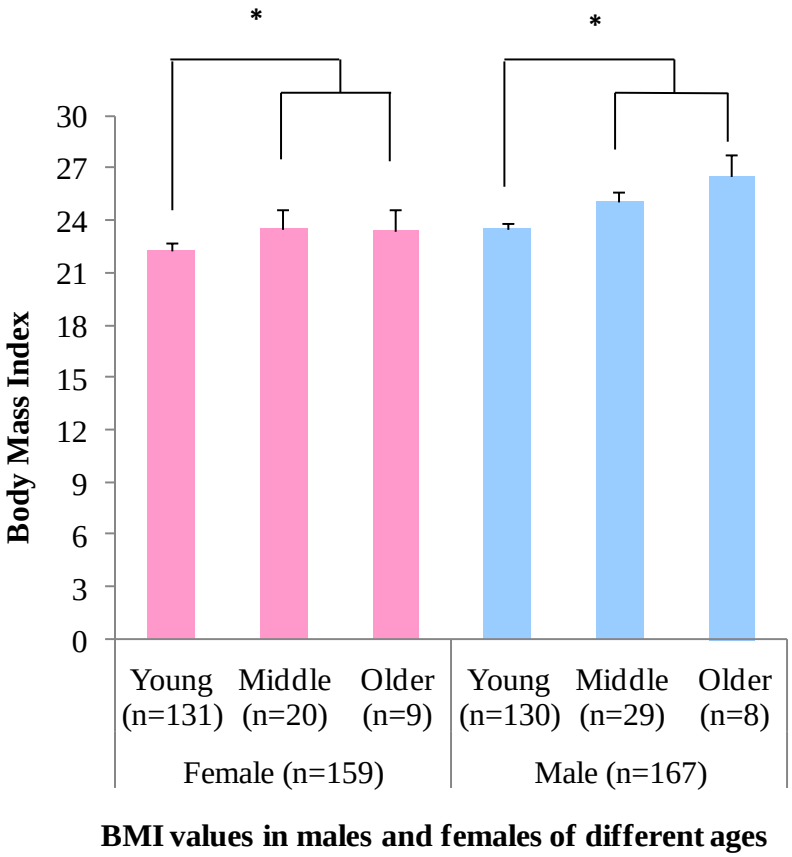

Figure 4.10 BMI values for the male and female subjects grouped into the relevant age categories. Data displayed are means ± SEM was significantly different compared to 'young' category ($p<0.05$), applying Bonferroni/Dunn's post-hoc procedure.

4.2.3. GENDER, ETHNICITY & BODY MASS INDEX (BMI)

Figure 4.11 shows the relationship between *gender*, *ethnicity* and *BMI* scores. The ANOVAS were performed on these separately for *males* and *females*. *Ethnicity* and *BMI* scores varied significantly with *female* subjects ($F(4,315)=4.918$, $p<0.05$. For *male* subjects, *ethnicity* and *BMI* scores varied significantly with ($F(4,315)=2.621$, $p<0.05$. For both *male* and *female* subjects, post-hoc comparisons indicated that *Caucasians* had higher *BMI* scores than *Asians* ($p<0.05$).

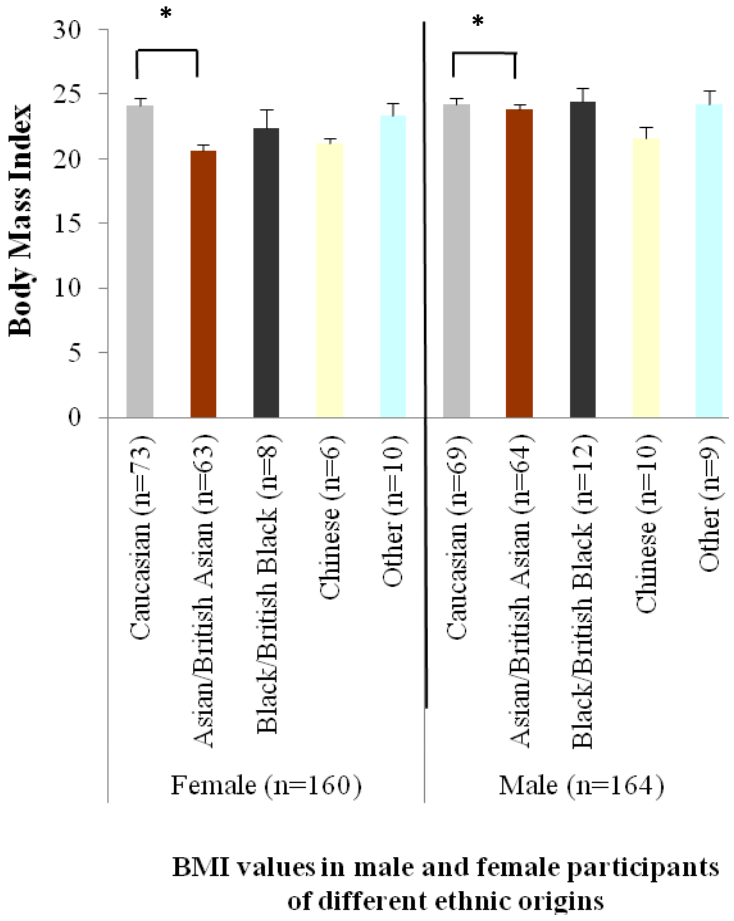

Figure 4.11 Mean BMI values ± SEM for males and females grouped according to self-reported, ethnic background with significantly different, $p<0.05$, Bonferroni/Dunn post-hoc test.

4.2.4. BODY MASS INDEX & HISTORY OF MENTAL ILLNESS

Figure 4.12 shows *BMI* values in subjects with or without a *history of mental illness*. ANOVA performed on these data showed a significant effect with ($F(2,325)=3.995$)=$p<0.05$. Post hoc Bonferroni/Dunn tests showed that there was a significant effect such that *'Yes'* responders had significantly higher *BMI* values than *'No'* responders.

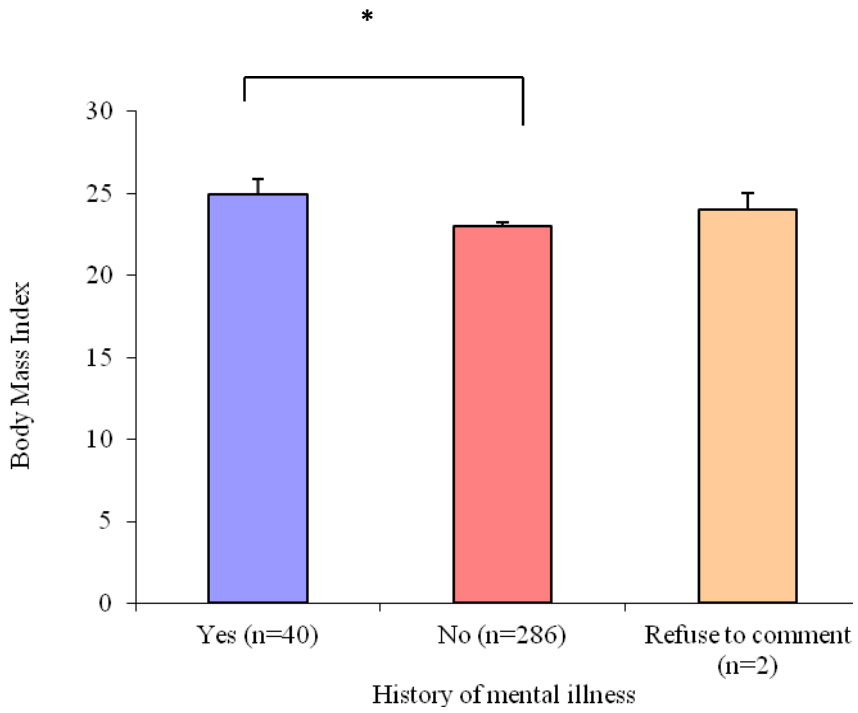

Figure 4.12 BMI mean values ± SEM in subjects with no history or a history of prior/current mental illness. *Significantly different p< 0.05, Bonferroni/Dunn test.

4.2.5. BODY MASS INDEX & RELATIONSHIP STATUS

Figure 4.13 shows the relationship between *BMI* values and *Relationship Status*. ANOVA performed on these data showed a significant effect with ($F(2,325)=4.089$, $p<0.05$. Post-hoc tests revealed that there was a significant difference between '*Yes'* and '*No'* responders ($p<0.05$). As is evident from the graph subjects who were in a relationship had a lower *Body Mass Index* than subjects who responded '*No'* and subjects who '*Did not Comment'*.

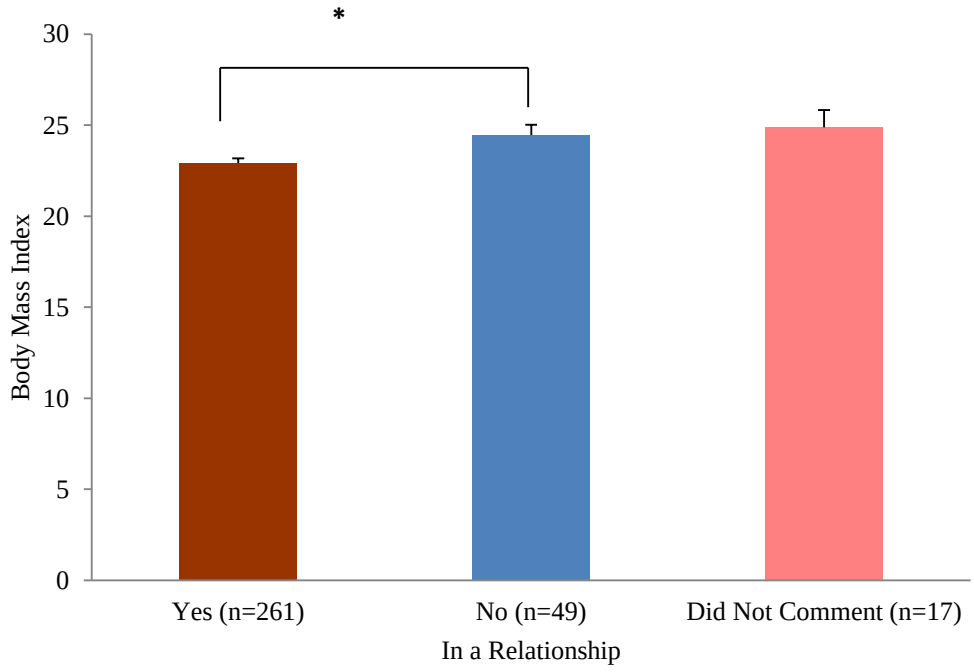

Figure 4.13 Participants relationship status and their body mass index values. Data shown are means ± SEM for BMI. *Significantly different from 'Yes' responders, p<0.05, Bonferroni/Dunn test.

4.2.6. GENDER, SELF RATED BODY & BODY MASS INDEX (BMI)

Figure 4.14 shows the relationship between *gender*, *self rating of body* and *BMI* values. ANOVA performed on these data revealed that *males* and *females*, *body mass index* and *self rate body* show a significant effect.

There was a main effect of *self body rating* on *BMI* values, with ($F(3,319)= 88.897$, $p<0.0001$. *BMI* values increased in subjects who rated themselves *lean, muscular* or *fat* in a sequential fashion. Further analysis on these data revealed a significant interaction between *gender* and *self rating of body type* with ($F(3, 319)=3.418$, $p<0.05$. As can be seen in figure 4. 14, *BMI* values were higher in subjects who rated themselves *muscular* or *fat*, compared to subjects who rated themselves *lean*, an effect that was exaggerated in *female* subjects.

Females who reported themselves as *lean* had lower *BMI* values than *lean male* subjects, but this effect reversed in *females* who reported themselves as *fat* compared to *males* reporting themselves as *fat*. Here *females* had higher *BMI* values than those of *male* subjects.

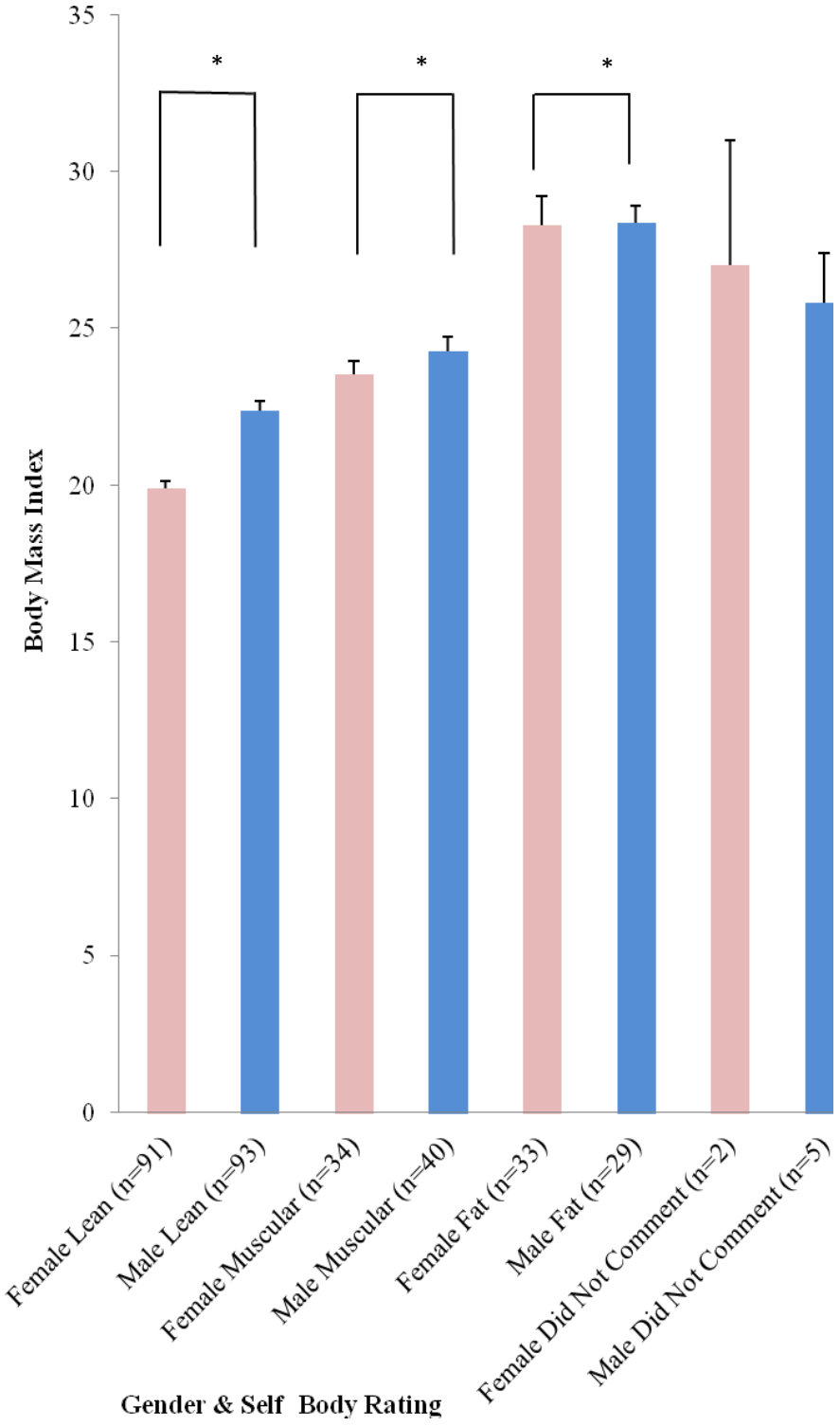

Figure 4.14 Self reported body type in female and male subjects and corresponding BMI values. Means ± SEM are shown. See text for a full description of the results. *Significantly different, p<0.05, Bonferroni/Dunn test.

4.2.7. SELF RATE OF APPEARANCE & SELF RATED BODY

Figure 4.15 shows the relationship between self rating of body type and appearance. ANOVA on these data revealed a significant interaction between *self rating body* and *self rating of appearance* ($F(3,355)=10.890$, $p<0.0001$. As shown in figure 4. 15 subjects with *muscular* physiques rated their appearance higher than those who rated themselves *fat* ($p<0.05$). The self rated *fat* group were seen to have the lowest levels of *self rating of appearance*. Such a difference did not exist when *muscular* subjects were compared to the *lean* subjects.

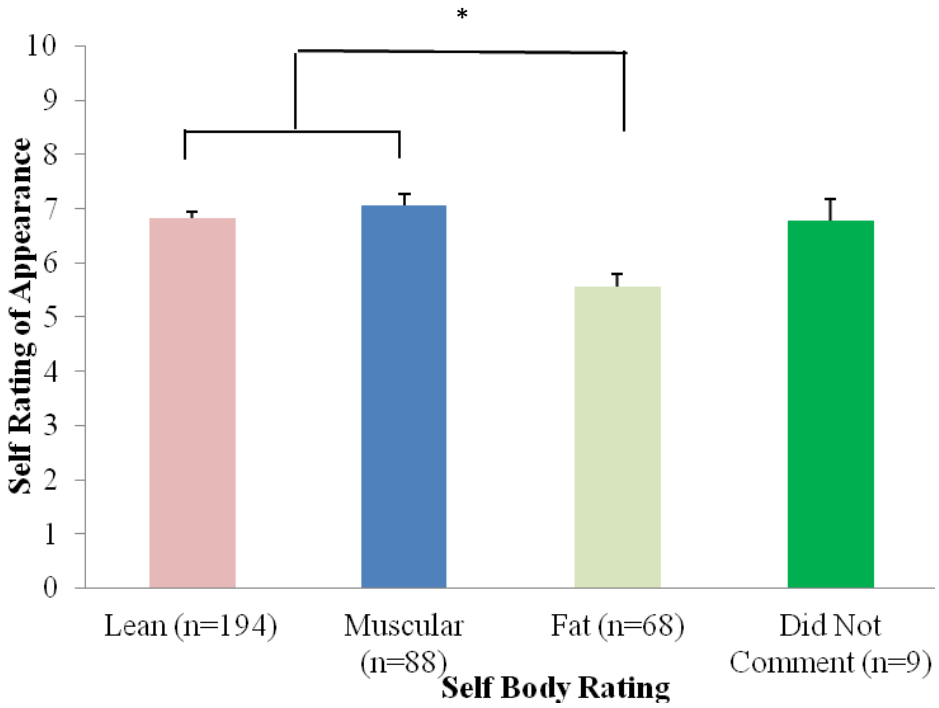

Figure 4.15 Participants self ratings of their appearance and their body type. Subject were given the option of Lean, Muscle, Fat or Did Not Comment to categorise themselves. Data displayed shows the mean ± SEM. * Significantly different, $p<0.05$, Bonferroni/Dunn test.

4.2.8. SELF RATING OF APPEARANCE & TIME SPENT CONCERNED

Figure 4. 16 illustrates the relationship between *self rating of appearance* and *time spent concerned about appearance*. ANOVA on these data showed that *self rating of appearance* and *time spent concerned* revealed a significant relationship between the two variables ($F(3,355)=5.333$, $p<0.05$. As is shown in figure 4. 16 the higher amount of *time spent concerned,* the lower the subjects rated their appearance. Low levels of *time spent concerned* showed higher ratings of appearance and this was also seen in the *did not comment* group.

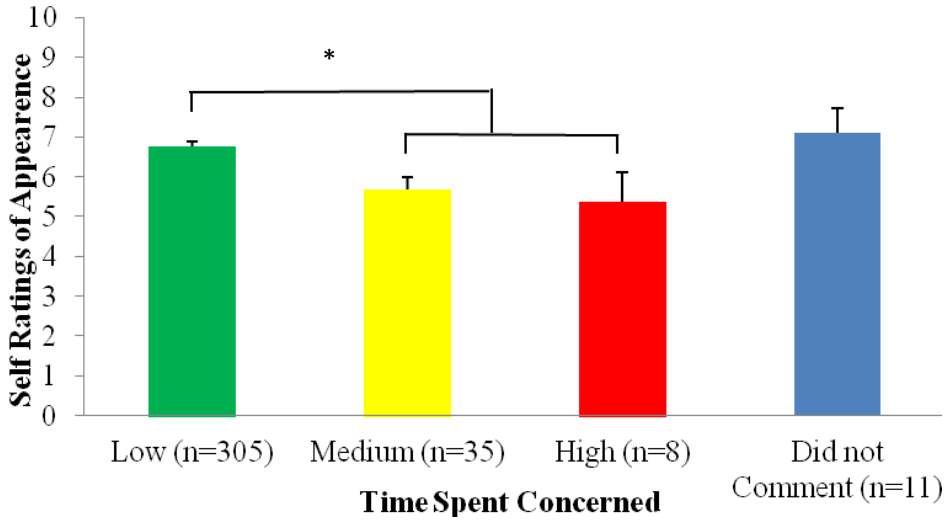

Figure 4.16 Self ratings of Appearance and Time Spent Concerned with appearance. Data shown are mean ± SEM. * Significantly different, p<0.05, Bonferroni/Dunn test.

4.2.9. GENDER, SELF RATING OF APPEARANCE & COMPARISON TO FRIENDS

Figure 4. 17 shows data examining subjects *self rating of appearance* in relation to how often they *compared themselves to their friends*. The left panel shows the data for *female* subjects, while the right panel shows the data for *male* subjects. There was no effect of *gender* on *self rating of appearance* with ($F(1,272)=2.795$, p: NS. There was however a significant interaction between *gender* and the frequency with which subjects *compared themselves to their friends* on *self rating of appearance* scores with ($F(3,272)=3.713$, $p<0.05$. Overall, *females* who *compared themselves to their friends* (*always* and *often* categories), also gave themselves higher *self rated appearance* scores. *Female* subjects who only *occasionally* or *rarely compared themselves to their friends*, tended to give themselves lower appearance scores. In contrast to the *female* subjects, the *male* subjects demonstrated an almost opposite response to that of the *females*. *Males* who *always compared themselves to their friends* gave themselves higher appearance ratings compared to the other categories. This observation is in agreement with *female* subjects results. However, whereas *female* subjects showed diminished self rating of appearance scores, which corresponded with decreasing levels of *time they compared themselves to their friends*, *male* subjects showed increasing *self rating of appearance* scores, with decreasing amounts of time they compared themselves to their friends.

As can be seen in figure 4. 17, the largest contrast occurs in subjects who only *occasionally* or *rarely compared themselves to their friends*. In *female* subjects, these categories of respondents gave quite low *self rating of appearance* scores, while in the *male* subjects for these categories, the *self rating of appearance* scores were considerably higher with respect to the other categories, and between *genders*.

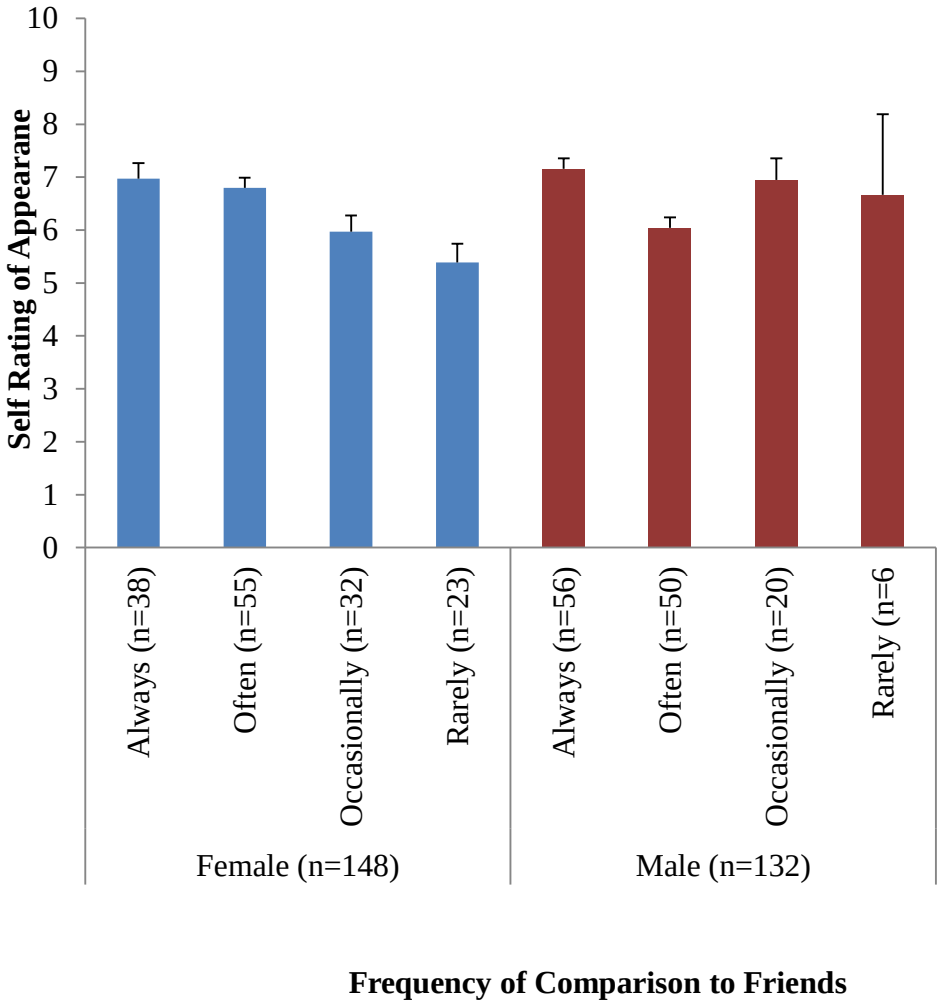

Figure 4.17 The differences between females and males with respect to their self rating of appearance, and how the frequency of with which they compared themselves to friends influence their self rating scores. Data shown are mean± SEM.

4.3. MEDIA

Figure 4. 18 shows the findings for subjects whose stated '*Yes*' or '*No*' to being influenced by media types (*film, magazines* and *high street* advertising) and the degree to which they were influenced by *peer pressure*. As can be seen, those subjects who reported that *film* influenced them showed higher *peer pressure* ratings ($F(1,353)=4.470$, $p<0.05$. Those who reported *magazines* influenced them showed higher *peer pressure* ratings ($F(1,351)=9.191$, $p<0.05$; and those who reported *high street* advertising influenced them also reported higher *peer pressure* ratings ($F(1,353)=51.20$, $p<0.05$. In general, subjects who were influenced by media sources, gave higher *peer pressure* scores compared to subjects who were not influenced by media sources.

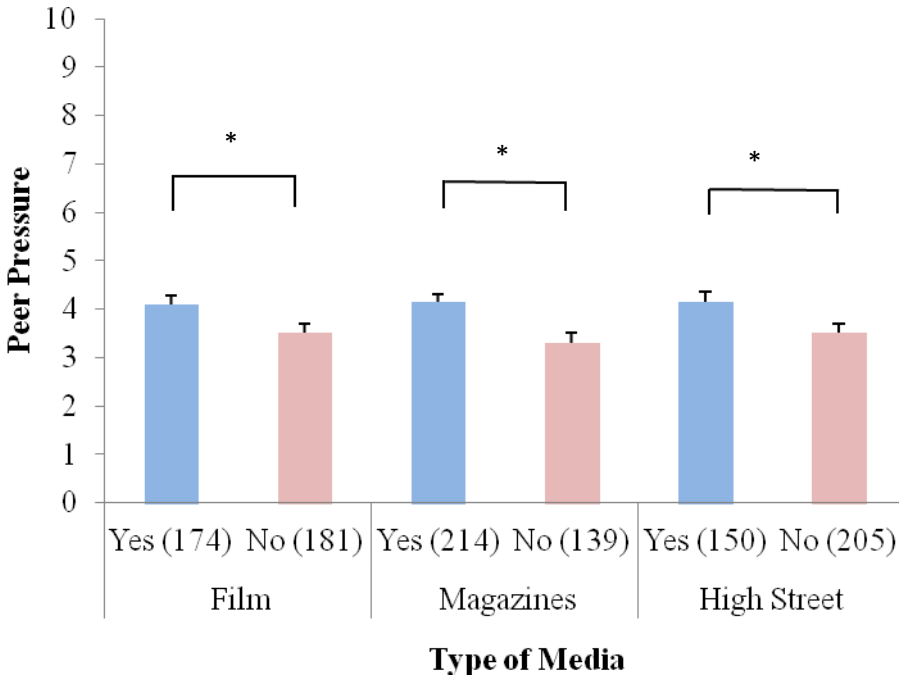

Figure 4.18 Findings associated with the effects of peer pressure and media i.e. film, magazines and high Street. The data shown are the means± SEM. * Significantly different from the corresponding 'Yes' respondents, p<0.05.

4.3.1. SELF VERSUS OTHERS & MEDIA (FILM)

Figure 4.19 shows the effects of the media subtype, *film*, and how subjects rated their own appearance in comparison to others. In other words, the data shown describes the responses of subjects who stated that *film* was *'Yes'* a source of influence on them, and their self rating in comparison to others, compared to subjects who stated that film was not *'No'* a source of influence on them. As is evident subjects who stated '*No'* to the effects of media (*film*) gave themselves higher values self rating themselves compared to others. Subjects who stated '*Yes'* to the effects of media (*film*) showed lower rating for themselves in comparison to others. ANOVA on these data revealed a significant outcome with ($F(1,353)=4.306$, $p<0.05$. This indicates that the '*No'* responders appeared to compare themselves to others moreso than the '*Yes'* group who showed lower values when rating themselves to others.

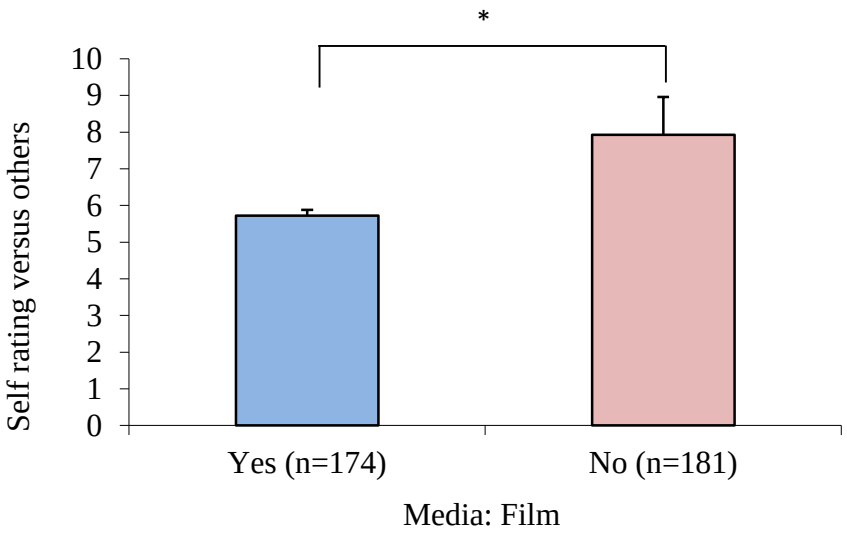

Figure 4.19 Self rating versus others, and the effects of media (films) influence on subjects who responded Yes or No. Data shown are means±SEM. * Significantly different from the corresponding 'Yes' respondents, p<0.05.

4.3.2. PRESSURE OF MEDIA INFLUENCE & MEDIA IN THE HIGH STREET

Figure 4.20 shows the data for subjects reporting that *media pressure* influence them and the relationship between *media pressure* and *high street* influences. As is evident from the below data respondents who said '*Yes', media pressure in general* reported influenced them the highest was pressure from *high street*. Subjects who commented *'No'* showed a much lower response to pressure from *high street* influences. This suggests that general feeling with regard to *media pressure* most effectively influence subjects exposured to *high street* sources.ANOVA on these data revealed that people who responded *'Yes'* to being influenced by media in general showed greater influences from the *high street* sources compared to those responding *'No'* and unaffected by media in general ($F(1,353)=4.924$, $p<0.05$. Note, *high street* influences refers to the clothing displays, models, poster boards internal/external advertising campaigns and so forth.

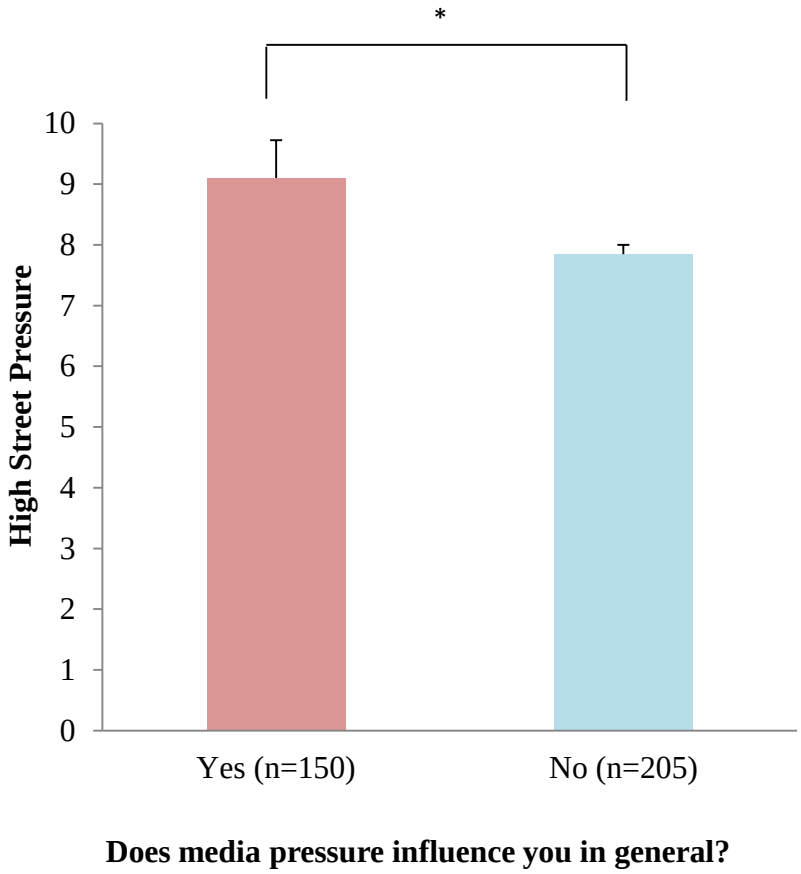

Figure 4.20 Participants responses to high street influences in terms of whether or not they were influenced by media sources in general. Data shown are Mean± SEM. * Significantly different from the corresponding 'Yes' respondents, p<0.05.

4.4. PEER PRESSURE & GENDER

Figure 4.21 illustrates the degree to which *male* and *female* subjects were affected by *peer pressure*. Overall *females* reported a great influence from *peer pressure* than did *male* subjects ($F(1,357)=14.177$, $p<0.05$.

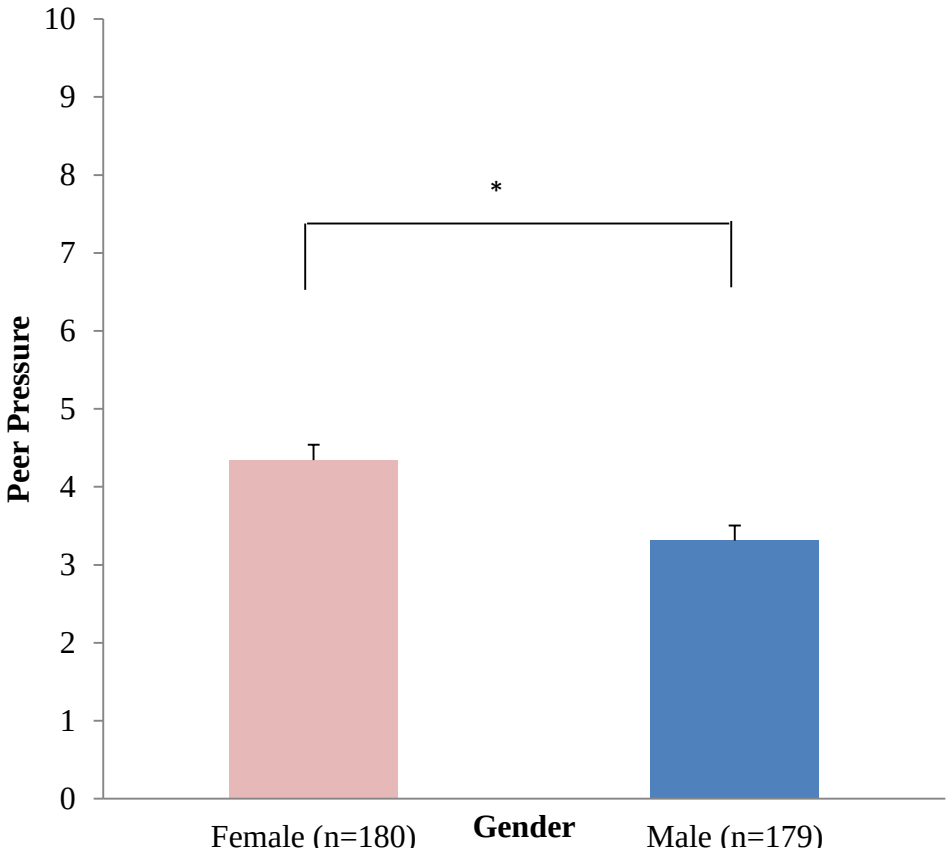

Figure 4.21 Effects of peer pressure ratings in male and female subjects. Data shown are mean± SEM. * Significantly different from females, p<0.05.

4.4.1. PEER PRESSURE & HISTORY OF MENTAL ILLNESS

Figure 4.22 shows *Peer Pressure* ratings and its relationship to the participants prior *History of Mental Illness*. There was a significant effect ($F(2,357)=3.451$, $p<0.05$ overall.

Participants whose stated that they had a *History of Mental Illness* showed the highest *Peer Pressure* ratings overall. Post hoc tests showed that there was a significant group interaction with the *Yes* and *No History of Mental Illness* group.

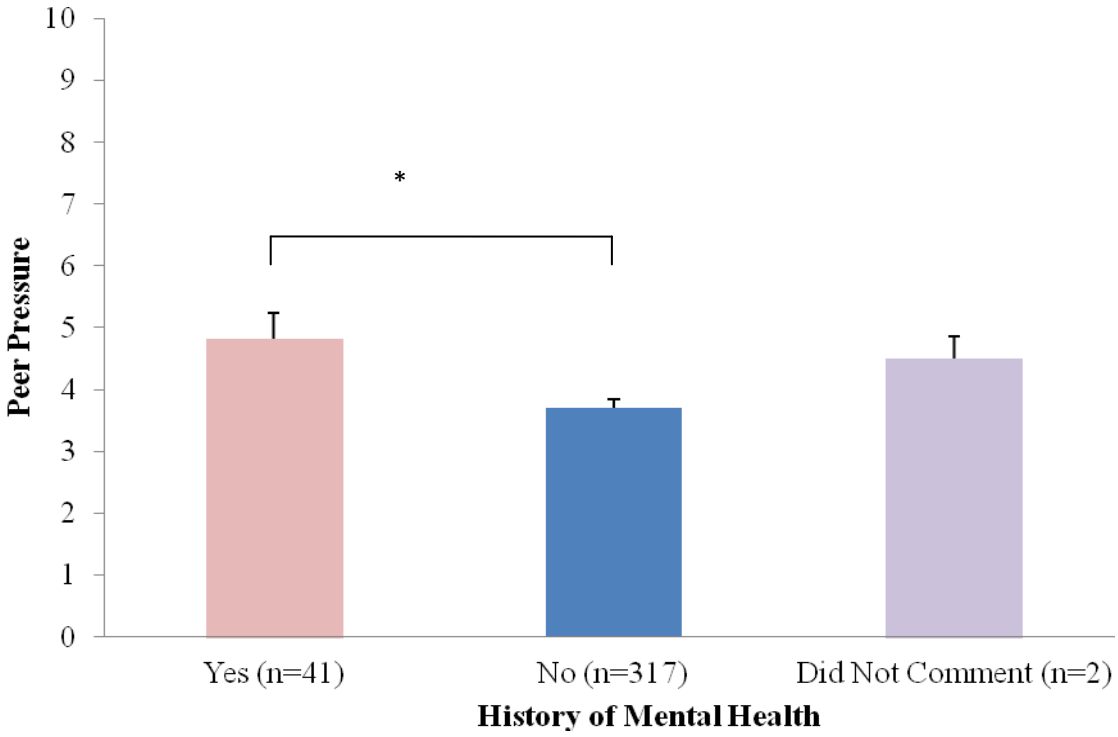

Figure 4.22 This figure shows how peer pressure ratings change with prior history of mental illness. As can be seen, subjects with Yes to prior history of mental illness showed high ratings of peer pressure compared to subjects with no history of mental illness. Data shown are the means± SEM.

4.4.2. PEER PRESSURE & COMPARISON TO FRIENDS

Figure 4.23 illustrates how participants rated *peer pressure* in relation to how often they *compared themselves to friends*. As can be seen there was a significant overall effect ($F(3,277)=18.693$, $p<0.01$. The *Always* group showed the lowest overall *Peer Pressure* scores.This was then followed by the *Often* group with the second lowest *peer pressure* scores, then the *Occasionally* group and finally the *Rarely* group, who were most affected by peer pressure when comparing themselves to friends.

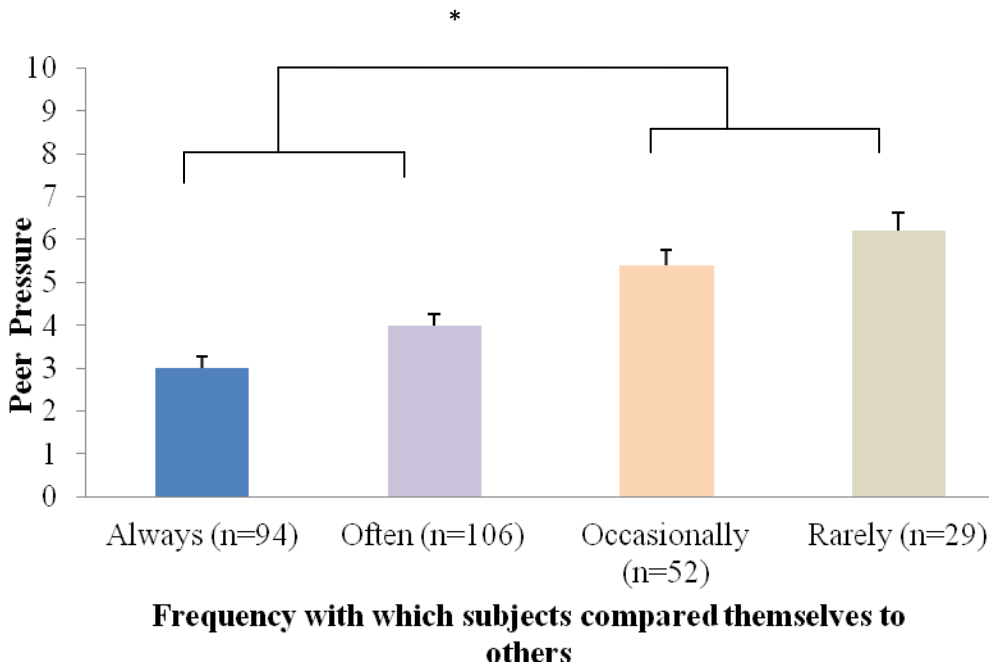

Figure 4.23 The effect of peer pressure and degree to which subjects compare themselves to their friends. Data shown are the means± SEM. *Significantly different from corresponding groups, p<0.05 Bonferroni/Dunn's test.

4.4.3. PEER PRESSURE & RECREATIONAL DRUG USE

Figure 4.24 shows participants' recreational drug use and their *peer pressure* ratings. As can be seen there was significant effect ($F(3,88)=3.329$, $p<0.05$. Participants who used recreational drugs on a *Regular* and *Sometimes* basis showed similar *peer pressure* responses. Participants who stated they had taken recreational drugs *Rarely* showed the highest *peer pressure* scores. Participants who stated that they had used recreational drugs *Only Once* showed the lowest of *peer pressure* scores.

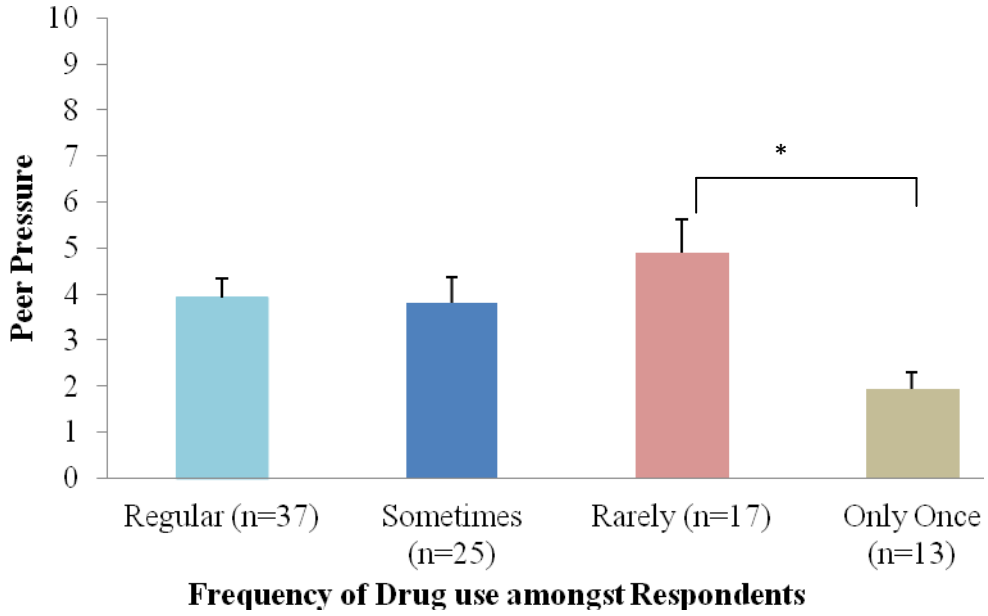

Figure 4.24 The relationship between subjects' recreational drug use, and the effects of peer pressure on them. Data shown are means± SEM. *significantly different *Rarely* group, p<0.05 Bonferroni/Dunn's test.

4.4.4. PEER PRESSURE & EXERCISE

Figure 4.25 shows the relationship between *Exercise* and *Peer Pressure*. As is evident respondents who replied '*Yes'*or '*No',* to *Exercise* showed similar responses to *Peer Pressure* scores. However, respondents who *Did Not Comment* showed much higher responses to *Peer Pressure* scores. ANOVA on the data for *Peer Pressure* and *Exercise* revealed that there was an overall significant outcome with ($F(2,356)=5.318$, $p<0.05$.

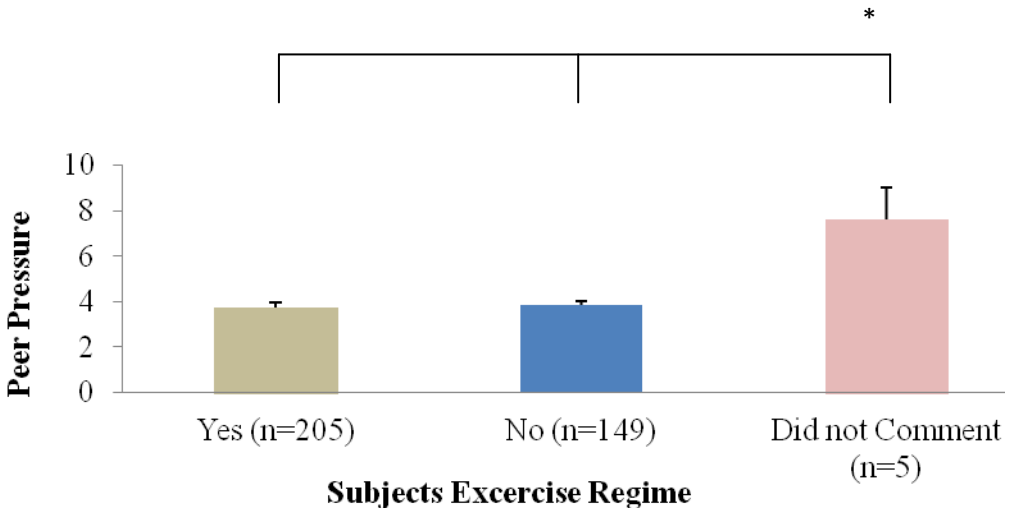

Figure 4.25 Peer pressure scores in relation to subjects exercise regime. Data shown are mean±SEM. *Significantly different from 'Yes' and 'No' responders, <p0.05, Bonferroni/Dinn's test.

4.4.5. PEER PRESSURE & SELF RATED BODY

Figure 4.26 shows *peer pressure* scores and subjects with different body types. Subjects described their own body types as *Lean, Muscular, Fat* or *Refused to Comment* and their responses to *peer pressure* were noted. As is evident the respondents who rated their body as *Lean* and *Muscular* indicated that they felt the least amount of *Peer Pressure*. The respondents who rated themselves as *Fat* indicated higher amounts of *Peer Pressure*. The *Did Not Comment* group however showed the highest amounts of *Peer Pressure* in comparsion to all the other groups. ANOVA for the data for *Self Rating of Body type* and values for *peer pressure* revealed an overall significant outcome with ($F(3,356)=2.887$, $p<0.05$.

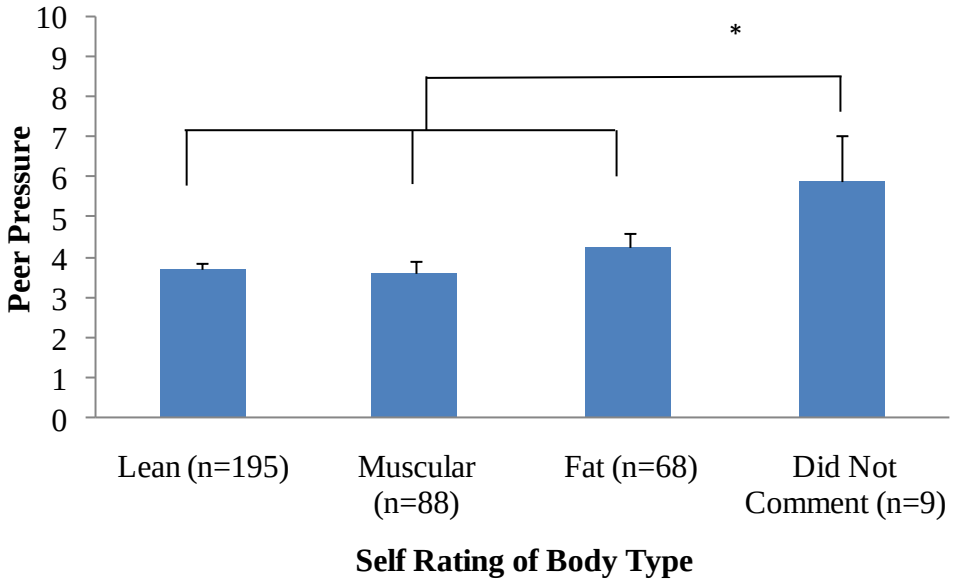

Figure 4.26 Body ratings of Lean, Muscular, Fat or Did Not Comment and respondents feelings of peer pressure. Data shown are mean±SEM. *Significantly different form all other groups, $p<0.05$, Bonferroni/Dunn's test.

4.4.6. PEER PRESSURE & BODY PART CONCERN: LEGS

Figure 4.27 shows *peer pressure* scores and *Body Part of Concern: Legs.* Participants who stated that their *Legs* gave them the greatest concern showed an increased response to *peer pressure* scores compared to subjects who were not bothered by their *Legs*. The overall significant outcome was ($F(1,355)=7.568$, $p<0.05$.

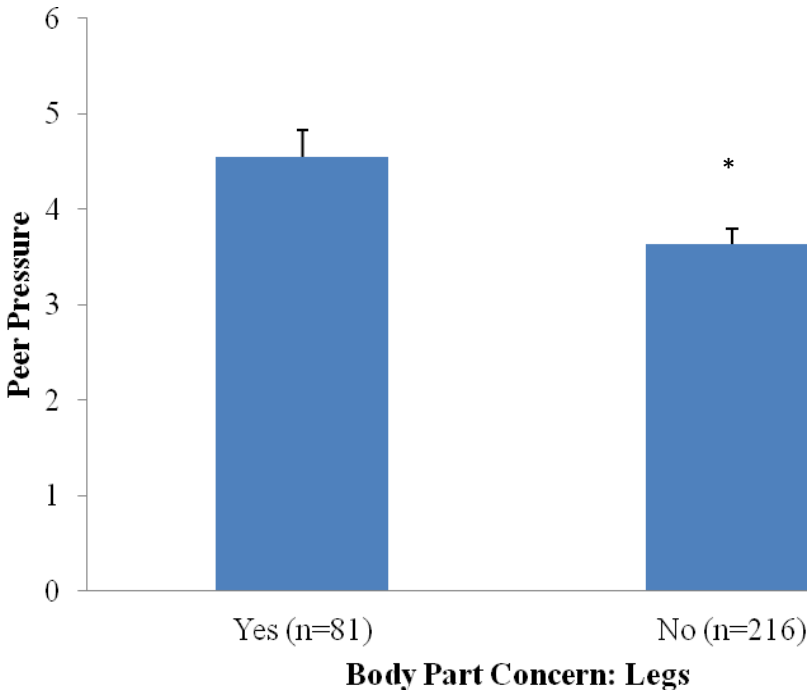

Figure 4.27 The effect of peer pressure in relation to body part of concern: Legs. Data shown are the means± SEM. *significantly different from the 'Yes' group, p<0.05, t-test.

4.5. BODY IMAGE QUESTIONS

The next section examines specifically designed body image questions and for the ease of interpretation, the graphs have abbreviated wording which corresponds to each specific question as can be seen in table 4.1.

Abbreviation	Corresponding Specific Question
Preoccupation & Concern	If you are at least concerned, do these concerns preoccupy you?
Concerns & Distress	Has your physical difference often caused you a lot of distress, torment or pain?
Concerns which Impair	Has your physical difference often caused you impairment in social, occupational or other important areas of functioning?
Concerns over Functioning	Has your physical difference significantly interfered with your work / your job, or your ability to function in your role?
Social Setting Concerns	Has your physical difference significantly interfered with your social life?
Avoidance Concerns	Do you ever avoid things because of your physical difference?

Table 4.1 Shows the abbreviation used to label the graphs throughout the results section and the specific question which respondents completed during the questionnaire.

4.5.1. BODY IMAGE QUESTIONS & GENDER

Figure 4.28 shows data for male and female groups separately and combined for the body image questions. Participants selected the most appropiate response to each body image question. The majority of participants selected *Not Concerned*, for each of the individual body image questions, and there was a step-wise decrease in respondents selecting severely affected categories for these questions.

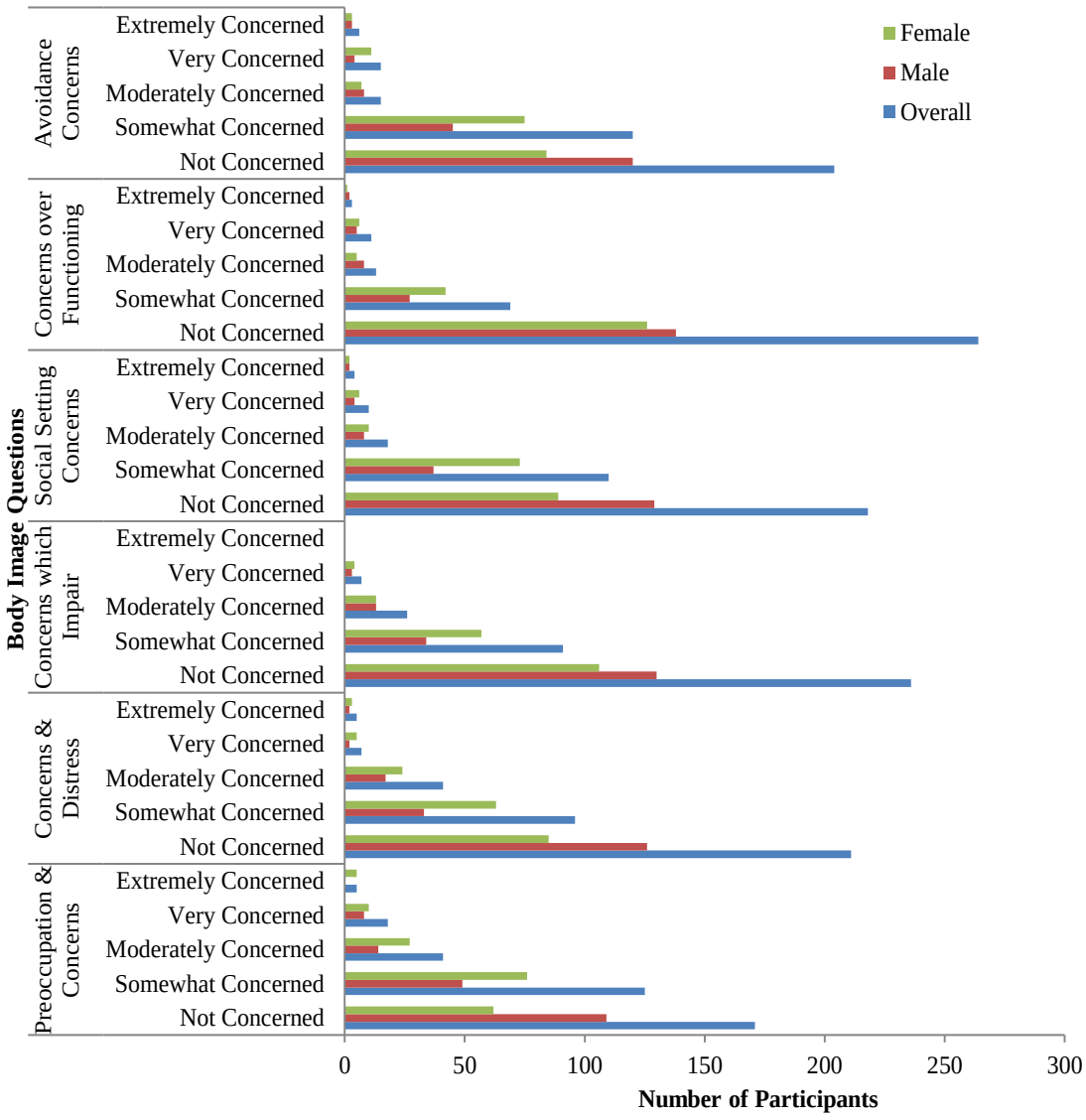

Figure 4.28 Participants responses to the body image questions on Preoccupation & Concern, Concerns and distress, Concerns which Impair, Social Setting Concerns, Concerns over Functioning and Avoidance Concerns. Data shown are actual number of participants. Females (green), Males (red) and combined (blue) groups.

4.5.2. BODY IMAGE QUESTIONS

Figure 4. 29 as can be seen from the frequency distribution the majority of particpants (n=311) would not be considered as having concerns over body image, with the cut off set at 8 and below. Participants who are highlighted in amber scored between 9-16 for the body image questions. These would be considered as having concerns about their body image (n=32). Finally, participants who scored 17> are highlighted in red and would be considered as pathologically affected by concerns with body image (n=6).

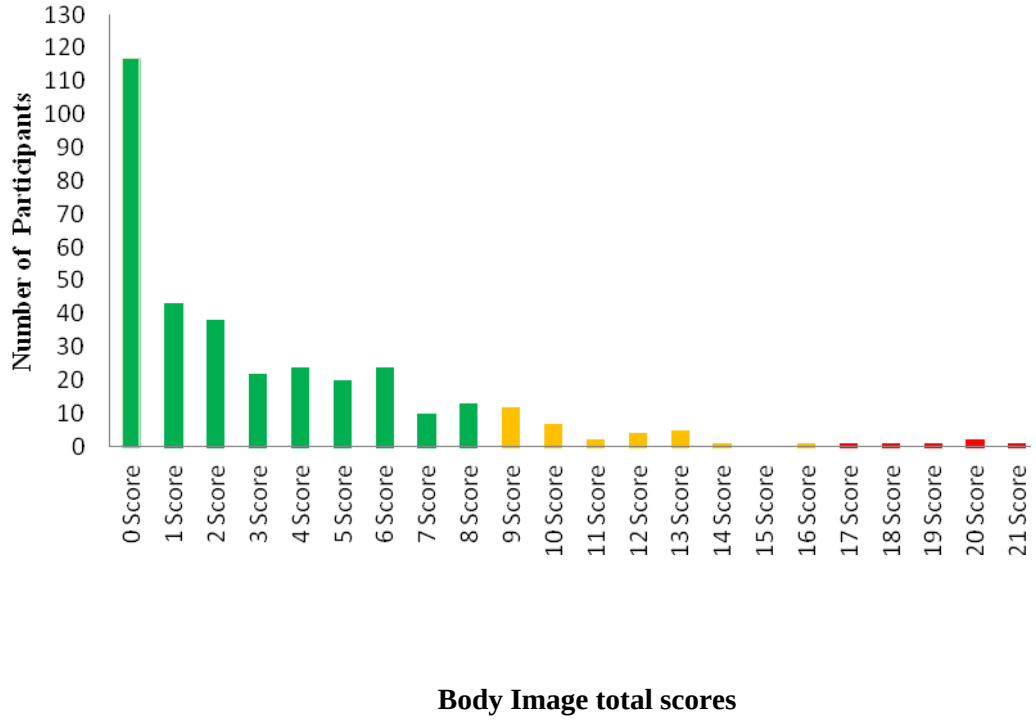

Figure 4. 29 Frequency distribution of scores for participants who completed the body image questions. The green columns represent participants who were not concerned, the amber column represents concerned, and the red column show particpants who would be considered as pathologically affected.

Figure 4.30 below shows that 89% of participants were not concerned with their body image. 9% were considered to be in the concerned category while 2% of the participants scored in the category for pathologically affected by their body image concerns and issues.

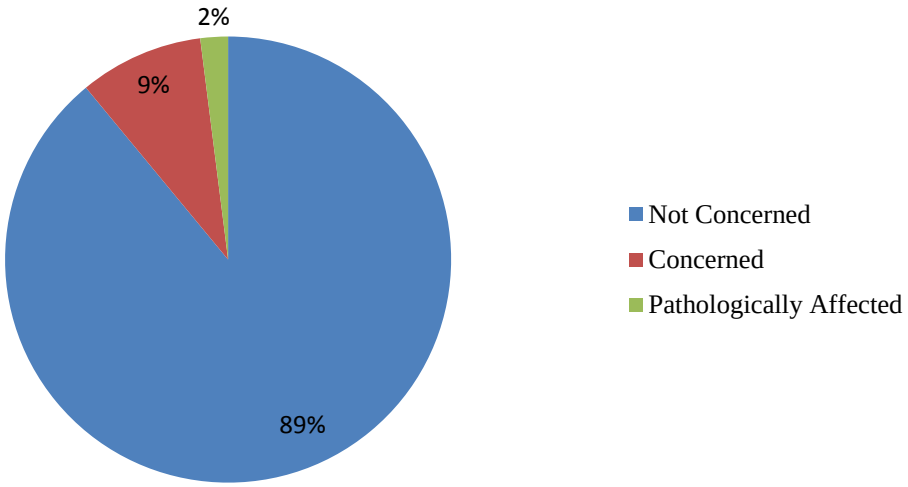

Figure 4.30 The percentage of subjects scoring not concerned, concerned or pathologically affected by body image issues.

4.5.3. PATHOLOGICALLY AFFECTED GROUP

As can be seen in table 4.2 and table 4.3 the pathologically affected group consisted of participants who scored greater than 17 for the body image questions. Out of a total of n= 360 participants, only six participants scored in this category.

Of these six participants, four of the participants were *female,* two in the *younger* age category, and two in the *middle* age category category. The remaining two participants were *male* in the *younger* age category.

In general, TV, film and fashion magazines were the principal sources that participants referred to for appearance related information. Subjects were asked to estimate the

degree to which they felt media pressure to conform to appearance ideals. Of the six pathological scoring participants, 100% i.e. all six of them gave high scores above seven and 50% of them gave media pressure the highest score possible. From this result we can presumably state that pathologically affected people with regards to appearance concerns, refer to the media for ideas regarding appearance. Ultimately, their failure to attain the desired appearance invokes an ambivalent relationship with media sources, which rather than serves as a guide for their appearance, becomes a source of distress.

Half of the subjects reacted and responded to peer pressure, remarking that it was a source of discomfort for them. But clearly media pressure sources serve as a more persuasive and larger influence on these subjects given that they all reported TV and film as key sources they referred to, but only 50% said the same of peers.

Collectively, these six subjects reflected the entire participant pool. They were a mix of ethnicities 2/6 had prior mental health problems, and they consumed alcohol at levels of social drinkers.

Table 4. 2 Stem and leaf plot shows the answers for the pathologically affected group for females.

Table 4. 3 Stem and Leaf plot showing the pathologically affected males who scored above 17 on the body image scores.

4.5.4. BODY IMAGE QUESTIONS AND SELF RATE OF APPEARANCE

Figure 4.31 shows participants *self-rated appearance* values for body image questions on *Preoccupation & Concern, Concerns and Distress, Concerns, which Impair, Social Setting Concerns, Concerns over Functioning* and *Avoidance Concerrns.*

The ANOVA for the appearance data for the *Preoccupation & Concerns* on appearance revealed a significant effect with ($F(4,354)=7.025$, $p<0.0001$. As shown in figure 4. 31 *self rating of appearance* scores dropped considerably in both *very concerned* about appearance and the *extremely concerned* about appearance groups.

The ANOVA for the appearance data for *Concerns & Distress* and *appearance ratings* show a significant outcome with ($F(4,354)=4.124$, $p<0.05$. Once again we observe that those subjects with the highest degree of *Concerns & Distress* have the lowest self rating of appearance values.

The ANOVA for the appearance data for *Concerns which Impair* and *appearance ratings* showed a significant result with ($F(3,55)=7.942$, $p<0.0001$. In general as the severity of these concerns increased from no concern to *some concern* to *moderately concerned* and so on the subjects with increased concerns gave lower *self ratings of appearance*.

The ANOVA for the appearance data for the *Social Setting Concerns* and *appearance ratings* show a significant outcome with ($F(4,354)=6.046$, $p<0.0001$. Significant group interaction were found for the *Social Setting Concerns* and *appearance ratings* which show that *Very Concerned* and *Not Concerned* were significant.

The ANOVA for appearance data for *Concerns over Functioning* and *appearance* subgroup showed a significant effect with ($F(4,354)=4.550$, $p<0.05$. Those participants

who expressed *very* or *extremely concerned* for the subgroup, gave significantly lower appearance scores to themselves compared to other subgroup categories.

The ANOVA for appearance data for *Avoidance Concerns* and *appearance* subgroup show a significant effect with ($F(4,354)=5.828$, $p<0.0001$. Those participants who expressed *very* or *extremely concerned* for the subgroup, gave significantly lower appearance scores to themselves compared to other subgroup categories.

Overall these data reveal that subjects with little concern with the body image features that are captured in their response to the subgrouping categories, i.e. those with minimal issue with concerns about their appearance, nor feel distressed by social settings, rate their own appearance within expected norms. However, participants who provided answers to the body image concerns with a negative outlook, i.e. are very or extremely concerned about appearance issues, assign themselves unfavourable rating of their own appearance.

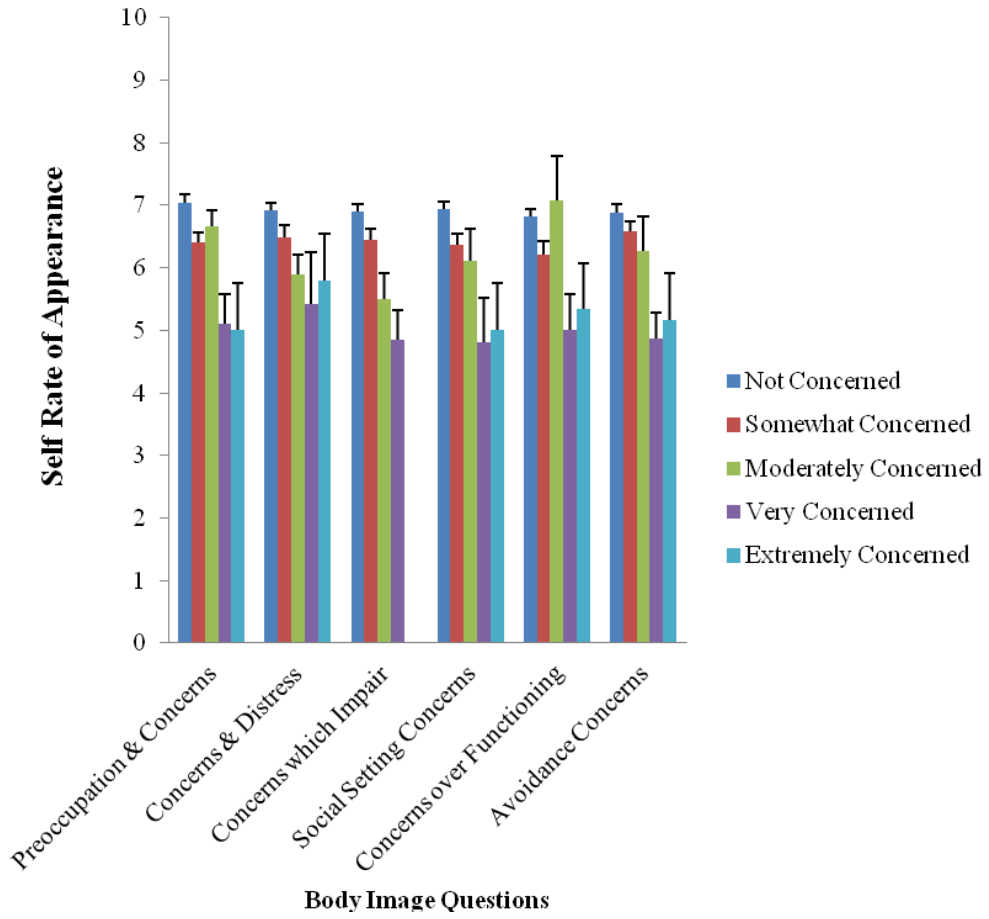

Figure 4.31 Body image questions that were used to derive the 6 unique categories that describe and define unique aspects of people's body image and appearance concerns. For all of these groups only those subjects who expressed high levels of concerns about their appearance, also assigned themselves low self-rated appearance scores. Data shown are means ±SEM. See text for a description of the statistical results.

Subjects Answers	Preoccupation & Concern	Concerns & Distress	Concerns Which Impair	Social Setting Concerns	Concerns over Functioning	Avoidance Concerns
Not Concerned (n=)	170	210	235	217	263	203
Somewhat Concerned (n=)	125	96	91	110	69	120
Moderately Concerned (n=)	41	41	26	18	13	15
Very Concerned (n=)	18	7	7	10	11	15
Extremely Concerned (n=)	5	5	0	4	3	6

Table 4. 4 The pattern of responses for the 358 subjects for each of the body image questions and their corresponding self rating of their appearance.

4.5.5. BODY IMAGE QUESTION AND PEER PRESSURE

Figure 4.32 shows body image questions on *Preoccupation & Concern, Concerns and Distress, Concerns, which Impair, Social Setting Concerns, Avoidance Concerrns* and respondents peer pressure ratings.

An ANOVA examining *Preoccupation & Concern* levels and its effect on how subjects rated the extent of *Peer Pressure* on them showed a significant effect with ($F(4,355)=4.918$, $p<0.05$.

An ANOVA examining *Concerns & Distress* levels and its effect on how subjects rated the extent of *Peer Pressure* on them showed a significant effect with ($F(4,355)=5.218$, $p<0.05$.

An ANOVA examining *Concerns which Impair* levels and its effect on how subjects rated the extent of *Peer Pressure* on them showed a significant effect with ($F(3,356)=3.858$, $p<0.05$.

An ANOVA examining *Social Setting Concerns* levels and its effect on how subjects rated the extent of *Peer Pressure* on them showed a significant effect with ($F(4,355)=3.659$, $p<0.05$.

An ANOVA examining *Avoidance Concerns* levels and its effect on how subjects rated the extent of *Peer Pressure* on them showed a significant effect with ($F(4,355)=3.740$, $p<0.05$.

As observed for self rating of appearance scores, a similar pattern emerges for how participants rated peer pressure influences, in conjunction with responses to the body image questions. Those subjects with higher levels of concern for their body image on each of the body image questions felt more peer pressure than did subjects with little concern with body image.

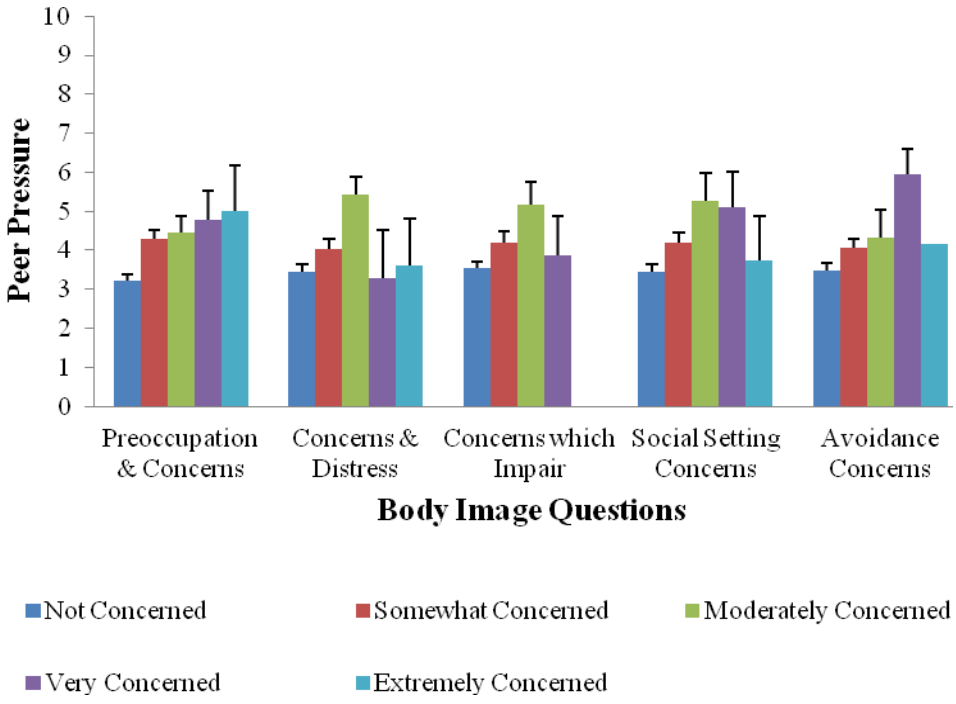

Figure 4.32 Peer pressure scores given by participants for each body image question. As body image concerns or disturbances rise i.e. become a source of distress (very concerned, extremely concerned), subjects report greater concerns and influence from peer pressure. Data shown are means ±SEM. See text for a statistical description of the data.

Subjects Answers	Preoccupation& Concern	Concerns & Distress	Concer Which Impair	Social Setting Concerns	Avoidance Concerns
Not Concerned (n=)	171	211	236	218	204
Somewhat Concerned (n=)	125	96	91	110	120
Moderately Concerned (n=)	41	41	26	18	15
Very Concerned (n=)	18	7	7	10	15
Extremely Concerned (n=)	5	5	0	4	6

Table 4. 5 The pattern of responses for the 358 subjects for each of the body image questions, with regards to how they were influenced by peer pressure.

4.5.6. CROSS CORRELATIONS MATRIX – BODY IMAGE TOTAL SCORES FOR MALES AND FEMALES

	PC	CD	CI	CS	CF	CA
PC	1.000	0.705 *	0.603 *	0.621 *	0.496 *	0.523 *
CD	0.705*	1.000	0.671 *	0.665 *	0.506 *	0.502 *
CI	0.603*	0.671*	1.000	0.671 *	0.491*	0.549*
CS	0.621*	0.665 *	0.671*	1.000	0.663*	0.640*
CF	0.496*	0.506 *	0.491*	0.663*	1.000	0.567*
CA	0.523*	0.502 *	0.549*	0.640*	0.567*	1.000

Key: PC = *Preoccupation & Concerns*, CD = *Concerns and Distress*, CI = *Concerns which impair*, CS= *Concerns in social settings*, CF = *Concerns over functioning*, CA = *Avoidance concerns.* * Significant p<0.05.

Table 4. 6 Cross correlation matrix for the total scores obtained for each of the body image categories.

Table 4.6 shows a cross correlation matrix for body image total scores and body image categories. A linear regression between *Preoccupation & Concern (PC)* values, with *Concerns & Distress (CD)* values revealed a significant positive relationship. The test of the correlation was ($F(1,353)=349.365$, $p<0.0001$.

A linear regression between *Preoccupation & Concern (PC)* values, with *Concerns which Impair (CI)* revealed a significant positive relationship. The test of the correlation was ($F(1,353)=203.083$, $p<0.0001$.

A linear regression between *Preoccupation & Concern (PC)* values, with *Social Setting concern (CS)* revealed a significant positive relationship. The test of the correlation was ($F(1,354)=205.393$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Concern over functioning (CF)* revealed a significant positive relationship. The test of the correlation was ($F(1,353)=103.875$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Avoidance Concern (CA)* revealed a significant positive relationship. The test of the correlation was ($F(1,353)=124.727$, $p<0.0001$.

A linear regression on *Concern & Distress (CD)* values, with *Concerns which impair (CI)* was a significant positive relationship. The test of the correlation was ($F(1,353)=290.257$, $p<0.0001$.

A linear regression on *Concerns & Distress (CD)* values, with *Social Setting concern (CS)* revealed a significant positive relationship. The test of the correlation was ($F(1.355)=279.389$, $p<0.0001$.

A linear regression *on Concerns & Distress (CD)* values, with *Concerns over functioning (CF)* revealed a significant positive relationship. The test of the correlation was ($F(1,354)=121.159$, $p<0.0001$.

A linear regression on *Concerns & Distress (CD)* values, with *Avoidance Concerns (CA)* revealed a significant positive relationship. The test of the correlation was ($F(1,354)=119.436$, $p<0.0001$.

A linear regression on *Concerns which Impair (CI)* values, with *Social Setting concerns (CS)* revealed a significant positive relationship. The test of the correlation was ($F(1,354)=277.758$, $p<0.0001$.

A linear regression on *Concerns which Impair* (CI) values, with *Concerns over functioning (CF)* revealed a significant positive relationship. The test of the correlation was ($F(1,353)=108.031$, $p<0.0001$.

A linear regression on *Concerns which Impair (CI)* values, with *Avoidance Concerns (CA)* revealed a significant positive relationship. The test of the correlation was ($F(1,353)=150.080$, $p<0.0001$.

A linear regression on *Social Setting concerns (CS)* values, with *Concerns over functioning (CF)* revealed a significant positive relationship. The test of correlation was ($F(1,356)=301.219$, $p<0.0001$.

A linear regression on *Social Setting concerns (CS)* values, with *Avoidance Concerns (CA)* revealed a significant positive relationship. The test of the correlation was ($F(1,356)=273.316$, $p<0.0001$.

A linear regression *on Concerns over functioning (CF)* values, with *Avoidance Concerns (CA)* revealed a significant positive relationship. The test of the correlation was ($F(1,355)=189.003$, $p<0.0001$.

4.5.7. CROSS CORRELATION MATIX – TOTAL BODY IMAGE SCORES FOR FEMALES

	PC	CD	CI	CS	CF	CA
PC	1.000	0.636*	0.612*	0.577*	0.524*	0.465*
CD	0.636*	1.000	0.704*	0.697*	0.608*	0.443*
CI	0.612*	0.704*	1.000	0.692*	0.558*	0.510*
CS	0.557*	0.697*	0.692*	1.000	0.678*	0.603*
CF	0.524*	0.608*	0.558*	0.678*	1.000	0.515*
CA	0.465*	0.443*	0.510*	0.603*	0.515*	1.000

Key: PC = *Preoccupation & Concerns*, CD = *Concerns and Distress*, CI = *Concerns which impair*, CS= *Concerns in social settings*, CF = *Concerns over functioning*, CA = *Avoidance concerns.* * Significant p<0.05.

Table 4. 7 Cross correlation matrix of the total scores obtained for each of the body image categories - females only.

Table 4.7 shows a cross correlation matrix females only for the total body image scores and the body image categories. A linear regression on *Preoccupation & Concern (PC)* values, with *Concerns & Distress (CD)* for *females* revealed a significant positive relationship outcome. The test of the correlation was ($F(1,176)=119.598$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Concerns which Impair (CI)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=105.380$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Social Setting concern (CS)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=87.729$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Concern over functioning (CF)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=66.690$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Avoidance Concern (CA)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=48.600$, $p<0.0001$.

A linear regression on *Concern & Distress (CD)* values, with *Concerns which impair (CI)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=173.147$, $p<0.0001$.

A linear regression on *Concerns & Distress (CD)* values, with *Social Setting concern (CS)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=168.411$, $p<0.0001$.

A linear regression *on Concerns & Distress (CD)* values, with *Concerns over functioning (CF)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=104.109$, $p<0.0001$.

A linear regression on *Concerns & Distress (CD)* values, with *Avoidance Concerns (CA)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=43.698$, $p<0.0001$.

A linear regression on *Concerns which Impair (CI)* values, with *Social Setting concerns (CS)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=162.128$, $p<0.0001$.

A linear regression on *Concerns which Impair* (CI) values, with *Concerns over functioning (CF)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=79.519$, $p<0.0001$.

A linear regression on *Concerns which Impair (CI)* values, with *Avoidance Concerns (CA)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=61.886$, $p<0.0001$.

A linear regression on *Social Setting concerns (CS)* values, with *Concerns over functioning (CF)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=150.938$, $p<0.0001$.

A linear regression on *Social Setting concerns (CS)* values, with *Avoidance Concerns (CA)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=101.673$, $p<0.0001$.

A linear regression *on Concerns over functioning (CF)* values, with *Avoidance Concerns (CA)* for *females* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=64.310$, $p<0.0001$.

4.5.8. CROSS CORRELATION MATIX – TOTAL BODY IMAGE SCORES FOR MALES

	PC	CD	CI	CS	CF	CA
PC	1.000	0.771*	0.586*	0.645*	0.479*	0.561*
CD	0.771*	1.000	0.623*	0.592*	0.392*	0.544*
CI	0.586*	0.623*	1.000	0.638*	0.417*	0.584*
CS	0.645*	0.592*	0.638*	1.000	0.657*	0.665*
CF	0.479*	0.392*	0.417*	0.657*	1.000	0.636*
CA	0.561*	0.544*	0.584*	0.665*	0.636*	1.000

Key: PC = *Preoccupation & Concerns*, CD = *Concerns and Distress*, CI = *Concerns which impair*, CS= *Concerns in social settings*, CF = *Concerns over functioning*, CA = *Avoidance concerns. Significant p<0.05**

Table 4. 8 Cross correlation matrix of the total scores obtained for each of the body images categories - males only.

Table 4.8 shows a cross correlation matrix males only for the total body image scores and the body image categories. A linear regression on *Preoccupation & Concern (PC)* values, with *Concerns & Distress (CD)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=255.992$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Concerns which Impair (CI)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=93.594$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Social Setting concern (CS)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=106.865$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Concern over functioning (CF)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=43.266$, $p<0.0001$.

A linear regression on *Preoccupation & Concern (PC)* values, with *Avoidance Concern (CA)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=69.706$, $p<0.0001$.

A linear regression on *Concern & Distress (CD)* values, with *Concerns which impair (CI)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=112.599$, $p<0.0001$.

A linear regression on *Concerns & Distress (CD)* values, with *Social Setting concern (CS)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=93.809$, $p<0.0001$.

A linear regression *on Concerns & Distress (CD)* values, with *Concerns over functioning (CF)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=30.828$, $p<0.0001$.

A linear regression on *Concerns & Distress (CD)* values, with *Avoidance Concerns (CA)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=72.911$, $p<0.0001$.

A linear regression on *Concerns which Impair (CI)* values, with *Social Setting concerns (CS)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=110.639$, $p<0.0001$.

A linear regression on *Concerns which Impair* (CI) values, with *Concerns over functioning (CF)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=35.614$, $p<0.0001$.

A linear regression on *Concerns which Impair (CI)* values, with *Avoidance Concerns (CA)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,175)=86.130$, $p<0.0001$.

A linear regression on *Social Setting concerns (CS)* values, with *Concerns over functioning (CF)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=157.486$, $p<0.0001$.

A linear regression on *Social Setting concerns (CS)* values, with *Avoidance Concerns (CA)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,177)=174.909$, $p<0.0001$.

A linear regression *on Concerns over functioning (CF)* values, with *Avoidance Concerns (CA)* for *males* revealed a significant positive relationship. The test of the correlation was ($F(1,176)=149.128$, $p<0.0001$.

Fundamentally, scores on the various questions examining body image views of the subjects show a high level of inter-correlation and all the correlations were significantly positive. Subjects who scored high on any given question also strongly tended to score high presumably because there is an underlying theme identified within these questions that perhaps render one or more as superfluous. Moreover, those subjects whose

particular scores on a given question were low when considering a body image issue tended to score low on the other body image questions when considering impact or disaffection. Collectively, these correlations reflect the types of people encountered for the study: those subjects who tended to not be bothered by body image concerns scored low on the majority questions versus those subjects who tended to have exaggerated body image concerns and exhibited inflated scores on the majority of questions.

4.5.9. CROSS CORRELATION MATRIX – FOR ALL SUBJECTS EXAMINING BODY IMAGE RATINGS OF APPEARANCE AND SOURCES OF INFLUENCE

	TBIS	SRA	SVO	PP	MPG	BMI	MPS
TBIS	**1.000**	**-0.243***	**-0.087 NS**	**0.219***	**-0.027 NS**	**0.092 NS**	**-0.021 NS**
SRA	**-0.243***	**1.000**	**0.242***	**-0.130***	**0.069 NS**	**-0.154 ***	**0.050 NS**
SVO	**-0.087 NS**	**0.242***	**1.000**	**0.005 NS**	**0.223***	**3.610E-4 NS**	**0.197 ***
PP	**0.219***	**-0.130***	**0.005 NS**	**1.000**	**0.235***	**0.085 NS**	**0.218***
MPG	**-0.027 NS**	**0.069 NS**	**0.223***	**0.235***	**1.000**	**0.042 NS**	**0.795***
BMI	**0.092 NS**	**-0.154***	**3.610E-4 NS**	**0.085NS**	**0.042 NS**	**1.000**	**0.042 NS**
MPS	**-0.021 NS**	**0.050 NS**	**0.197***	**0.218***	**0.795 ***	**0.042 NS**	**1.000**

Key: TBIS= total body image score, SRA= self-rate appearance, SVO= self-versus others, PP peer pressure, MPG= media pressure general, BMI= body-mass index and MPS= media pressure self. * Significant p<0.05.

Table 4.9 Shows the correlations between total body image scores, self-rating of appearance, self-versus others, peer pressure, media pressure general, body mass index (BMI) and media pressure.

Table 4.9 shows cross correlations for the total body image scores, appearance and sources of influence for all subjects. A linear regression on *total body image scores*, with *self-rate of appearance* values revealed a significant negative relationship ($F(1, 356)= 24.477$, $p<0.0001$.

A linear regression between *total body image scores*, with *self-versus others* values failed to show significance with ($F(1,357)=2.461$, p: NS.

A linear regression on *total body image scores,* with *peer pressure* values revealed a significant positive effect with ($F(1,357)=15.204$, $p<0.0001$.

A linear regression on *total body image scores,* with *media pressure in general* values failed to show significance with ($F(1,357)=0.125$, p: NS.

A linear regression on *total body image scores,* with *body mass index* values failed to show significance with ($F(1,357)=2.769$, p: NS.

A linear regression on *total body image scores,* with *media pressure self values* failed to show significance with ($F(1,357)=0.130$, p: NS.

A linear regression on *self-rate of appearance* values, with *self-versus others* values showed a significant positive effect with ($F(1,357)=20.781$, $p<0.0001$.

A linear regression on *self-rate of appearance* values, with *peer pressure* values showed a significant negative effect with ($F(1,357)=6.157$, $p= 0.0135$.

A linear regression on *self-rate of appearance* values, with *media pressure in general* values failed to show significance with ($F(1,357)=1.550$, p: NS.

A linear regression on *self-rate of appearance* values, with *body mass index* values showed a significant negative effect with ($F(1,326)=7.357$, $p= 0.0064$.

A linear regression on *self-rate of appearance* values, with *media pressure self values* failed to show significance with ($F(1,357)=0.840$, p: NS.

A linear regression on *self-versus others* values, with *peer pressure* values failed to show significance with ($F(1,357)=0.011$, p: NS.

A linear regression on *self-versus others* values, with *media pressure general* values showed a significant positive effect with ($F(1,358)=18.807$, $p<0.0001$.

A linear regression on *self-versus others* values, with *body mass index* values failed to show significance (F(1,357)=3.763E-4, p: NS.

A linear regression on *self-versus others* values, with *media pressure self values* showed a significant positive effect with (F(1,358)=11.976, p=0.0006.

A linear regression on *peer pressure* values, with *media pressure in general* values showed a significant positive effect with (F(1,358)=18.879, p<0.0001.

A linear regression on *peer pressure* values, with *body mass index* values failed to show significance (F(1,326)= 0.651, p: NS.

A linear regression on *peer pressure* values, with *media pressure self values* showed a significant positive effect with (F(1,358)=11.478, p=0.0008.

A linear regression on *media pressure general* values, with *body mass index* values failed to show significance with (F(1,326)=2.324, p: NS.

A linear regression on *media pressure general* values, with *media pressure self values* showed a significant positive effect with (F(1,358)=407.136, p<0.0001.

A linear regression on *body mass index* values, with *media pressure self values* failed to show significance with (F(1,326)=0.581, p: NS.

4.5.10. CROSS CORRELATION MATRIX FOR MALES, EXAMINING BODY IMAGE RATING OF APPEARANCE AND SOURCES OF INFLUENCE

	TBIS	SRA	SVO	PP	MPG	BMI	MPS
TBIS	1.000	-0.233*	-0.107 NS	0.181*	-0.064 NS	0.130*	-0.071 NS
SRA	-0.233*	1.000	0.302*	-0.098 NS	0.096 NS	-0.069 NS	0.080 NS
SVO	-0.107 NS	0.302*	1.000	0.099 NS	0.378*	0.101 NS	0.315*
PP	0.181*	-0.098 NS	0.099 NS	1.000	0.310*	-0.027 NS	0.244*
MPG	-0.064 NS	0.096 NS	0.378*	0.310*	1.000	0.069 NS	0.761*
BMI	0.130 *	-0.069	0.101 NS	-0.027 NS	0.069 NS	1.000	0.021 NS
MPS	-0.071 NS	0.080 NS	0.315*	0.244*	0.761*	0.021 NS	1.000

Key: TBIS= total body image score, SRA= self-rate appearance, SVO= self-versus others, PP peer pressure, MPG= media pressure general, BMI= body-mass index and MPS= media pressure self. * Significant p<0.05.

Table 4. 10 Table shows correlations between total body image scores, self-rating of appearance, self-versus others, peer pressure, media pressure general, body mass index (BMI) and media pressures self - males only.

Table 4.10 shows cross correlations for total body image scores, appearance and sources of influence for males only. A linear regression on *total body image scores*, with *self-rate of appearance* values for *males* showed a significant negative effect with ($F(1,178)= 13.718$, $p<0.0003$.

A linear regression on *total body image scores*, with *self-versus others* values for *males* failed to show significance with ($F(1,178)=2.100$, p: NS.

A linear regression on *total body image scores*, with *peer pressure* values for *males* showed a significant positive effect with ($F(1,178)=6.020$, $p=0.0151$.

A linear regression on *total body image scores*, with *media pressure in general* values for *males* failed to show significance with ($F(1,178)=0.626$, p: NS.

A linear regression on *total body image scores,* with *body mass index* values for *males* showed an significant positive effect with (F(1,166)=4.700, p=0.0316.

A linear regression on *total body image scores* and *media pressure self* for *males* failed to show significance with (F(1,178)=1.031, p: NS.

A linear regression on *self-rate of appearance,* with *self-versus others* values for *males* showed a significant positive effect with (F(1,178)=15.188, p<0.0001.

A linear regression on *self-rate of appearance*, with *peer pressure* values for *males* failed to show significance with (F(1,178)=1.140, p: NS.

A linear regression on *self-rate of appearance*, with *media pressure in general* values for *males* failed to show a significance with (F(1,178)=1.498, p: NS.

A linear regression on *self-rate of appearance,* with *body mass index* values for *males* failed to show significance with (F(1,166)=0.795, p: NS.

A linear regression on *self-rate of appearance,* with *media pressure self values* for *males* failed to show significance (F(1,178)=1.082, p: NS.

A linear regression on *self-versus others,* with *peer pressure* values for *males* failed to show a significance with (F(1,178)=1.742, p: NS.

A linear regression on *self-versus others,* with *media pressure general* values for *males showed* a significant positive effect with (F(1,178)=29.821, p<0.0001.

A linear regression on *self-versus others,* with *body mass index* values for *males* failed to show a significance with (F(1,166)=1.718, p: NS.

A linear regression on *self-versus others,* with *media pressure self values* for *males* showed a significant positive effect with (F(1,178)=19.832, p<0.0001.

A linear regression on *peer pressure,* with *media pressure in general* values for *males* showed a significant positive effect ($F(1,178)=16.425$, $p<0.0001$.

A linear regression on *peer pressure,* with *body mass index* values for *males* failed to show significance with ($F(1,166)= 0.121$, p: NS.

A linear regression on *peer pressure,* with *media pressure self values* for *males* showed a significant positive effect with ($F(1,178)=10.490$, $p=0.0014$.

A linear regression on *media pressure general,* with *body mass index* values for *males* failed to show significance with ($F(1,166)=0.803$, p: NS.

A linear regression on *media pressure general,* with *media pressure self* for *males* showed a significant positive effect with ($F(1,178)=243.229$, $p<0.0001$.

A linear regression on *body mass index* values, with *media pressure self* values for *males* failed to show significance with ($F(1,166)=0.071$, p: NS.

4.5.11. CROSS CORRELATION MATRIX FOR FEMALES EXAMINING BODY IMAGE RATINGS OF APPEARANCE AND SOURCES OF INFLUENCE

	TBIS	SRA	SVO	PP	MPG	BMI	MPS
TBIS	**1.000**	**-0.248***	**-0.057 NS**	**0.156 ***	**0.026 NS**	**0.093 NS**	**0.101 NS**
SRA	**-0.248***	**1.000**	**0.175***	**-0.135***	**0.030 NS**	**-0.251 ***	**-0.016 NS**
SVO	**-0.057 NS**	**0.175***	**1.000**	**-0.068 NS**	**-0.022 NS**	**-0.092 NS**	**-0.019 NS**
PP	**0.156 ***	**-0.135***	**-0.068 NS**	**1.000**	**0.140 NS**	**0.250***	**0.248 NS**
MPG	**0.024 NS**	**0.030 NS**	**-0.022 NS**	**0.140 NS**	**1.000**	**0.020 NS**	**0.938***
BMI	**0.093 NS**	**-0.251 ***	**-0.092 NS**	**0.250***	**0.020 NS**	**1.000**	**0.080 NS**
MPS	**0.101 NS**	**-0.016 NS**	**-0.019 NS**	**0.248 NS**	**0.938***	**0.080 NS**	**1.000**

Key: TBIS= total body image score, SRA= self-rate appearance, SVO= self-versus others, PP peer pressure, MPG= media pressure general, BMI= body-mass index and MPS= media pressure self. * Significant p<0.05.

Table 4.11 Shows correlations between total body image scores, self-rating of appearance, self-versus others, peer pressure, media pressure general, body mass index (BMI) and media pressures females only.

Table 4.11 shows a cross correlation for the total body image scores, appearance and sources of influence for females only. A linear regression on *total body image scores*, with *self-rate of appearance* values for fe*males* showed a significant negative effect with (F(1,177)= 10.714, p=0.0013.

A linear regression on *total body image scores*, with *self-versus others* values for fe*males* failed to show significance with (F(1,177)=0.447, p: NS.

A linear regression on *total body image scores*, with *peer pressure* values for *females* showed a significant positive effect with (F(1,177)=4.219, p=0.0414.

A linear regression on *total body image scores*, with *media pressure in general* vales for *females* failed to show significance with (F(1,177)=0.167, p: NS.

A linear regression on *total body image scores,* with *body mass index* values for *females* failed to show a significance with (F(1,157)=1.603, p: NS.

A linear regression on *total body image scores,* with *media pressure self* values for *females* failed to show significance with (F(1,177)=0.579, p: NS.

A linear regression on *self-rate of appearance,* with *self-versus other* values for *females* showed a significant positive effect with (F(1,177)=6.215, p<0.0136.

A linear regression on *self-rate of appearance,* with *peer pressure* values for *females* showed a significant negative effect with (F(1,177)=4.636, p=0.0327.

A linear regression on *self-rate of appearance,* with *media pressure in general* values for *females* failed to show significance with (F(1,177)=0.164, p: NS.

A linear regression on *self-rate of appearance,* with *body mass index* values for *females* showed a significant negative effect with (F(1,158)=10.656, p=0.0013.

A linear regression on *self-rate of appearance,* with *media pressure self* values for *females* failed to show significance with (F(1,177)=0.020, p: NS.

A linear regression on *self-versus others*, with *peer pressure* values for *females* failed to show significance with (F(1,178)=0.845, p: NS.

A linear regression on *self-versus others*, with *media pressure general* values for *females* failed to show significance with (F(1,178)=0.082, p: NS.

A linear regression on *self-versus others,* with *body mass index* values for *females* failed to show significance with (F(1,158)=1.335, p: NS.

A linear regression on *self-versus others,* with *media pressure self* values for *females* failed to show significance with (F(1,178)=0.079, p: NS.

A linear regression on *peer pressure,* with *media pressure in general* values for *females* failed to show significance with (F(1,178)=3.401, p: NS.

A linear regression on *peer pressure,* with *body mass index* values for *females* showed a significant positive effect with (F(1,158)=10.606, p=00015.

A linear regression on *peer pressure,* with *media pressure self* values for *females* failed to show significance with (F(1,178)=2.085, p: NS.

A linear regression on *media pressure general,* with *body mass index* values for *females* failed to show significance with (F(1,158)=0.062, p: NS.

A linear regression on *media pressure general,* with *media pressure self* values for *females* showed a significant positive effect with (F(1,178)=130.641, p<0.0001.

A linear regression on *body mass index,* with *media pressure self* values for *females* failed to show significance with (F(1,158)=1.014, p: NS.

Please refer to Appendix II for all non-significant data for Study One.

CHAPTER FIVE

5.1. DISCUSSION – STUDY ONE

5.1.1. DEMOGRAPHICS & FREQUENCY DISTRIBUTIONS

Study One contained approximately equal numbers of *females* (50.1%) and *males* (49.9%). Overall, the majority of participants were from the *younger* age category (80%), followed by the *middle* age category (15%), and finally the *older* age category (5%). It has been shown that females are more likely to have body image concerns than men (Feingold & Mazzella, 1998). However body image concerns are on the increase in men. The media now emphasises a muscular/athletic build for men (Pope *et al*, 2000; Lerner *et al*, 1972). Muscular/athletic physiques are viewed more positively than body types such as slim and obese (Harrison et al, 2000).

The majority of participants were from the *Asian/British Asian* ethnic group (41.9%), followed by the *Caucasian* group (41.1%) the *Black/British black* group (5.9%), the *Chinese* (4.5%) group, and finally the *other* group with (6.4%). Studies have shown that there are some differences between ethnicities and body image concerns, body mass index and what is deemed attractive within various cultures and societies (Yates, 2004; Mayville, 1999).

The majority of participants stated that they were *in a relationship* (80%). There were 15% who stated that they were *not in a relationship* and 5% *refused to comment*. The majority of subjects were *heterosexual* (90.8%), with only 5.8% stating *other* which included bisexual and homosexual. The remaining subjects gave *no comment* (3.3%). It has been shown that people who are in a relationship may not be as concerned with

weight issues as people who are single (Averett *et al*, 2008). Furthermore research indicates that homosexual men may have more concerns with regards to body image concerns and dissatisfaction (Levesque & Vichesky, 2006).

Participants were asked if they had ever had cosmetic surgery. The majority of participants stated *no* (97.2%), while the remaining subjects had some cosmetic procedure at one point in their lives (2.3%). Subjects were asked if they would ever consider possibly having cosmetic surgery in the future. The overall majority of participants replied *no* (78%). Some 10.8% participants who stated that they Would Consider having a cosmetic surgery procedure at some point in their lives. Further 11.1% participants stated that they would *maybe consider* having a cosmetic surgery procedure. Interestingly, there has been a rise in surgical and nonsurgical cosmetic procedures for both males and females (ASAPS, 2008) over the past decade. Cosmetic procedures such as Botox, glycolic acid peels, and other beauty treatment enhancements are all designed to slow down the appearance of aging, and this is becoming increasingly popular within the general populace (ASAPS, 2008; The British Association of aesthetic plastic surgeons, 2010).

The majority of subjects had *no* history of mental illness (88%), however 11.3% stated that they had a history of mental illness 0.6% *refused to comment*. Research has shown that mood disorders, such as depression, are preceded by stressful life events and people who have had a history of mental illness are more likely to have comorbidities with other disturbances such as body image issues and body dysmorphic disorder (Phillips *et al*, 1997; Grant *et al*, 2006; Coles *et al*, 2006).

The majority of subjects stated that they engaged a *regular* exercise routine (57%), while 41.5% stated that they *did not* have a regular exercise regime. A few, (1.3%) of

subjects *refused to comment* on their exercise regime. Exercise is recommend as a part of a normal daily routine, however factors such as obligatory exercise where one feels pressure to exercise in order to maintain a particular body image can be an important indicator of body image dissatisfaction (Pasman & Thompson, 1988; Adkins & Keel, 2005). Subjects were asked to rate their physiques from *lean, muscular* or *fat*. The majority of participants stated that they had a *lean* physique (54.1%), followed by *muscular* physique (24.4%), a *fat* physique (18.8%), while a small group *refuse to comment* (2.5%). Thin ideals seem to be of importance within the westernised world for women and that muscular ideals are important for men. Heavy focus from the media on thin/muscular images can have significant effect on the development of body image disturbance and problems with eating behaviour. Exposure to these 'ideal physiques' has been one of the primary causes for girls and boys striving for unrealistic body image ideals (Ricciardelli & McCabe, 2001; Low *et al,* 2003; Flament *et al,* 2012).

The majority of participants stated that they spent little *time concerned about their appearance* (85%) followed by *medium amount of time spent concerned on appearance* (9.7%), a smaller proportion spent a *high amount of time concerned about their appearance* (2.2%). Studies have indicated that subjects who are concerned about their appearance or their body image ideals will spend more time pre-occupied about their appearance. These concerns can be so severe that significant disruptions in social functioning may occur (Phillips, 2005).

The majority of participants stated that they *often* compared themselves to friends (37.7%). This was then followed by subjects who *always* compared themselves to friends (33.4%). The remaining third of subjects *occasionally* or *rarely* compared themselves to friends. An important part in adolescent development is to invest and model your fellow peer groups. Adolescents will actively engaging risk-taking

behaviours and conform to various beliefs, attitudes and ideals of their fellow peers (Coleman, 1980; Levine *et al*, 1994; Thompson *et al*, 2007).

5.1.2. BODY IMAGE – AREAS OF CONCERN

The data for which body areas raised the most concerns revealed interesting gender differences: Females were generally more concerned with two main areas the *stomachs* (78%), followed by the *buttocks*. Females who had concerns also named their *face* (22%), *arms* (19%) and *legs* (16.5%).

Illustration of the main areas of concern expressed by females

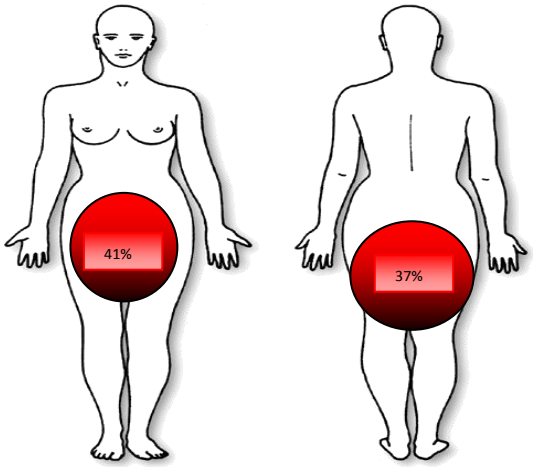

Figure 5.1 A female illustration of the front and back highlighted in red are the two most fundamental body image concerns.

Males indicated that their main areas of concern were their *stomachs* (28.6% of respondents), *face* (15%) and *buttocks* (14.6%).

Illustration of the main areas of concern expressed by males

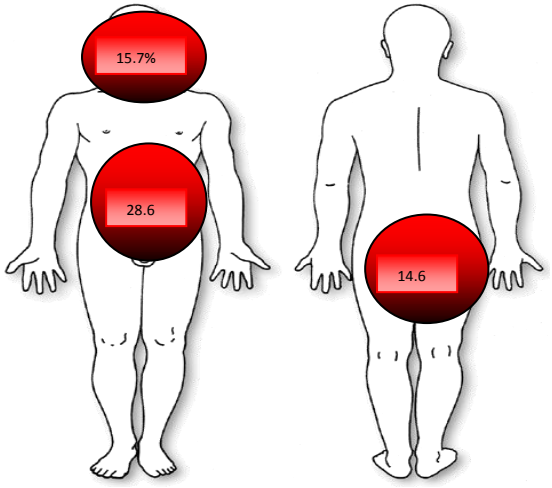

Figure 5.2 A male illustration of the front and back highlighted in red are the two most fundamental body image concerns.

Female subjects showed great concern over their stomachs, which is consistent with striving for lower waist-to-hip ratios (Singh 1993; Singh 1995). Males view lower waist-to-hip ratios favourably for females as this indicates reproductive potential and youth. Higher waist-to-hip ratios have been shown to predict disease states such as diabetes and cardiovascular illness (Singh, 1993; Singh, 1995). This may subconsciously affect men's preferences when choosing a prospective mate.

Interestingly females did not list their *faces* as an area of concern, yet facial symmetry, full lips, clear skin and clear eyes are some of the most important criteria when the opposite sex selects a mate (Symonds, 1970). This suggests that females regard being thin as more important than facial beauty. However non-cosmetic facial procedures to enhance appearance (e.g. Botox) have increased significantly from 1997

to 2008 by some 3638.1%. Other procedures such as chemical peels, laser hair removal and hyaluronic acid treatments are also on the rise (American Society for Aesthetic Plastic Surgery, 2008). However corrective procedures targeting the stomach and buttocks have been popular in cosmetic surgeries, with lipoplasty particularly on the increase.

Our study also found that males expressed concerns about their *stomachs*. We suspect that with the increase in masculine representation in the media, male celebrities and sporting figures have increased men's desires for a defined muscular abdominal appearance with the characteristic V-shaped torso (Adams *et al*, 2005; McCreary *et al*, 2000). Interestingly, men's second most concerned area was their *face*; again this could be due to multiple factors. More attractive faces invoke more positive judgments due to the halo effect, and maintaining a youthful appearance in current society is advantageous (Adams *et al*, 2005; Thorndike, 1920; Asch, 1946). This is reflected in cosmetic surgery procedures for men which show substantial rises over the past decade (American Society for Aesthetic Plastic Surgery, 2008).

5.1.3. BODY MASS INDEX

Subjects who rated their *stomach* and *arm* areas as points of concern had higher overall *body mass index* values than subjects who expressed *no* concern over these particular body areas. Those subjects with higher *body mass index* scores showed higher concern over these particular body image areas. This could be due to the thin/muscular ideals that people strive for i.e. lower waist hip ratio, the V-shaped torso which emphasises youthfulness, reproductive worth and falls within the current media

influenced ideal shape (Adams *et al*, 2005; Thorndike, 1920; Asch, 1946, Singh 1993; Singh 1995, Stice *et al*, 1994).The *younger* age categories for males and females had the lowest *body mass index* values in comparison to the *middle* and *older* age categories. This could be due to many factors younger people tend to have higher metabolic rates and lead more active lifestyle (Nube *et al*, 1998; Pattersen *et al*, 1994; Najjar & Rowland, 1987).

Body mass index values were significantly higher in the *Caucasian* groups compared to the *Asian/British Asian* ethnic groups. This could be due to a number of factors including eating habits and food choices versus traditional eastern food. However, genetic and metabolic components in association with lifestyle could all play a role in these differences (Yates, 2004). Furthermore, different ethnic groups have been shown to have different associations between body fat percentage and fat distribution and this is particularly true of Asian and Pacific populations (James et al, 2002).

Subjects with a *history of mental illness* showed higher overall *body mass index* values than subjects with *no* mental illness history. It is known that people with mental illness are less physically active than the general population (McCreadie, 2003). This could be due to a number of factors such as the sedative effects of some medications and mental illness itself, i.e. someone who has depression may find it difficult to become motivated into a regular exercise routine. Furthermore, diet may be an issue for people who have serious mental illness as they may not be taking full care of their dietary habits and consuming the daily recommended intake of fruit and vegetables instead favouring higher salt/fat/sugary foods (DH, 2004; McCreadie, 2003; WHO, 2003).

Participants who were *in a relationship* had lower *body mass index* values in comparison to subjects were *not in a relationship*. Research suggests that men prefer lower waist-to-hip ratios in women as this demonstrates youthful characteristics and reproductive fertility (Singh, 1993; Singh, 1995). For women a more athletic v-shaped male torso is preferred, however looks and weight although important are not the primary factors for women when choosing a mate. Factors such as social status, the ability to provide for them and their offspring, security, protection and financial support are also important factors when women choose a mate (Schaller, 1963; Buss, 1989; Sarwar *et al*, 2003).

When subjects were asked to *self-rate* their bodies the *lean* group had the lowest *body mass index* values, followed by *muscular* body types. Both males and females who self-rated their body as *'fat'* had the highest *body mass index* values. This indicates that subjects accurately rated their body types against their *body mass index* values. This could be due to a number of factors; there is a growing fixation within the media to have thin ideals for women and muscular ideals for men and this pressure causes males and females to become more aware of their body type and shape (Harrison et al, 2000; Feinglold & Mazzella, 1998; Adams et al, 2005). Indeed, subjects as a rule had a reasonable guess of their own *body mass index* values and may have based their self-ratings on their known *body mass index* values. Friends and peers may also be a contributing factor.

When subjects *self-rated* their overall appearances those with, *muscular* builds rated themselves highest in terms of appearance, followed by *lean* subjects. Subjects who rated themselves as *fat* rated their appearance as the lowest. Given that thin ideals are emphasized in the media, those believing themselves to be fat may automatically feel less attractive (Thompson *et al*, 1999; Garner *et al*, 1980; Stice *et al*, 1994). For

males, the emphasis on muscular physiques is increasingly idealized and appears popular within media (Boni, 2002; Kimmel et al, 1999; Harrison et al, 2000; Adams et al, 2005). Therefore, subjects who fit into the idealised body image shape seemingly rated their appearance higher than subjects who did not fit into the idealised body image shape (Hoek et al, 2003).

Subjects were asked to *self-rate their appearance* against how much *time they spent concerned about their appearance*. Subjects who stated they spent a *low* amount of time concerned about their appearance gave themselves the highest appearance ratings. Subjects who spent a *medium* amount of time concerned about their appearance gave themselves lower appearance ratings. Not unexpectedly, the subjects who spent the *highest* amount of time concerned about their appearance gave themselves the *lowest* ratings of appearance. Individuals who have body image dissatisfaction and serious forms of body image disturbances such as body dysmorphic disorder, will spend large amounts of their time concerned and pre-occupied about their appearance or on particular aspects of their appearance (Phillips, 1991; Cororve & Geeves, 2001). Generally, these subjects become consumed and fixated and feel negativity towards themselves and manifest significant body image dissatisfaction (Phillips, 2005; Cororve & Geeves, 2001).

Males and females were asked to *self-rate* their appearance and *compare themselves to friends*. Female data showed that the more people compared themselves to their friends, the higher they rated their appearance. For males, those subjects who *always* compared themselves to friends gave themselves the highest appearances ratings. For males the emphasis to compare themselves may not be as important to them as what it is for females. This suggests that females who actively compare themselves to their friends feel they are more attractive than people who rarely compare themselves to

friends. As we have previously mentioned, forming social groups with your fellow peers is a part of everyday life and an important developmental process. Thoughts, beliefs, trends and traits are adopted during friendships and social interaction. Therefore, comparing oneself to others could re-affirm one's body image ideals and appearance. Furthermore, within one's social group dynamics, it is important to show that one is the best candidates for sexual selection (Paxton *et al*, 1999; Coleman, 1980).

5.1.4. MEDIA

Male and female participants who were affected by *peer pressure* were also affected by certain types of media. Subjects who said *yes* to experiencing *peer pressure* also felt pressure from *films, magazines* and the *high-street* media sources compared to subjects who were unaffected by *peer pressure*. It is accepted that peer pressure within social groups is common and an important part of our self-development (Coleman, 1980; Paxton *et al*, 1999). Moreover, media influence on current ideal body image has become unrealistic for women (too thin) and for men (muscular/athletics). Researchers have suggested that the media has somewhat influenced body image disturbances within people, primarily women, and has led to eating disorders (Thompson *et al*, 1999; Garner *et al*, 1980).

Interestingly, those subjects who expressly stated that they were not pressured by images from *films* gave themselves *higher* appearance ratings compared to others. This suggests that the more you actively compare their body types to others the less likely the effects of *film* will have on the individual. This could be due to the fact that comparing internally to other people who are realistic sizes rather than underweight, very thin

actresses or actors with muscular/athletic physiques (Thompson *et al*, 1999; Garner *et al*, 1980).

Subjects who felt *media pressure in general* influenced them were most profoundly affected by media advertised on the *high street*. The high-street consumer shopping for the latest fashions, clothing and cosmetic products must confront various difficulties. First, when selecting various items of clothing people become increasingly aware of your body shape and size. Mannequin dummies and models show the latest fashion on a size 0 (UK size 4) frames. These fashion items therefore may not suit the majority of regular sized women. Second, in the majority of shop window displays will be photographs of celebrities, models, sports athletes, actors and actresses promoting particular products. These contrived and fictitious displays make the individual question their current body image ideals (Thompson *et al*, 1999; Garner *et al*, 1980; Maltby *et al*, 2005; Houran *et al*, 2005; Stice *et al*, 1994).

5.1.5. PEER PRESSURE

Females have higher *peer pressure* values than males. This corroborates current research suggesting that females are more likely to compete, conform and seek similar goals for weight (Matsumoto *et al*, 1999; Epstein, 1989).

Interestingly, subjects with a prior *history of mental illness* scored higher *peer pressure* values, than subjects with *no* mental illness history. These subjects are likely more susceptible in having a re-occurrence of mental health issues and even developing comorbid conditions such as obsessive-compulsive disorder, social phobias,

pathological skin picking, and body image related disturbances (Phillips *et al*, 1997; Coles *et al*, 2006).

Unexpectedly, subjects who *always* compared themselves to friends felt the least amount of *peer pressure*. Intuitively, one might reason that such people might well express more influence of peers, given they feel the need to compare themselves to others. It is vital that we compare and contrast ourselves within our social groups as this emphasises we are the same as the other group members. This is an essential part of forming friendships. If people do not compare themselves to their friends and are using other external comparisons/sources such as the media or show no interest in friendship groups then these subjects are not conforming to the ideals, attitudes, and belief systems of their friendship groups. Rather they identify ideals from media sources which in turn create in more internal pressure and external pressure (Thompson *et al*, 1999; Garner *et al*, 1980; Maltby *et al*, 2005; Houran *et al*, 2005; Stice *et al*, 1994).

Subjects who *rarely* used recreational drugs felt the *highest* amount of *peer pressure*. Subjects who *regularly* participated in the use of recreational drugs provided moderate values for the effect of *peer pressure*. Again friendship groups are known to practice risk-taking behaviours such as smoking and drinking. Interestingly, the one-time drug use group showed the *lowest* amount of *peer pressure*. These individuals may be more rigid in their own belief systems and will not feel the full effects of peer pressure (Thompson *et al*, 1999; Garner *et al*, 1980; Maltby *et al*, 2005; Houran *et al*, 2005; Stice *et al*, 1994).

Participants who exercised *regularly* and those who *did not* exercise regularly felt very little effects of *peer pressure*. However subjects who *did not comment* if they exercised had very high scores for *peer pressure*. These subjects may be very shy or

embarrassed to state in the questionnaire if they exercised or not. When subjects were asked to rate their body types against the effects of *peer pressure* the *lean* and *muscular* groups gave relatively low *peer pressure* scores. The *fat* body type group expressed slightly higher amounts of *peer pressure*. However, the subjects who *did not comment* gave the highest *peer pressure* scores. These subjects again maybe embarrassed or have had negative experiences because of their weight which is the reason why they might not have commented on their body type. These subjects may have a distorted perception of body shape and cannot therefore comment on their actual body type perhaps due to a body image disturbance (Amorose, 2001; Grogan, 2007; Cash, 2002).

5.1.6. BODY IMAGE QUESTIONS

The findings for the frequency distribution show that the majority of subjects were not considered to have body image concerns with 89% of the subjects falling within a scoring in a range of 0-9. Nine per cent of subjects who were considered to have concerns regarding their body image scored with a range of 9-16. The remaining 2% of subjects were deemed to have body image disturbance and scored 17 and higher. The prevalence of body dysmorphic disorder from the only epidemiology study revealed an incidence rate of 2.4% (Koran *et al*, 2008). Another study which included 83 females and 25 males from an undergraduate psychology program which specifically used a body dysmorphic disorder metric reported an incidence of between 0.7% -13% (Bilby, 1998). Findings for adolescents whose age ranged between 14 years to 19 years reported a rate of 2.2% for body dysmorphic disorder (Mayville *et al*, 1999).

Subjects were asked to rate their appearance and this was compared against their response to the body image questions. The overall trend suggested that the subjects who

scored as either *very concerned* or *extremely concerned* over their appearance gave themselves *lower* overall appearance ratings. Appearance ratings were *highest* in subjects from the *not concerned* category. This finding suggests that subjects who were not particularly concerned about any specific aspect of their appearance rated their appearance higher. Those subjects who felt more concerned in response to the body image questions rated their appearance lower. People who have body image disturbances will generally dislike a particular aspect of their appearance. Many subjects who live with body image disturbance find daily life challenging. Day-to-day living with a particular disturbance such as this can cause people to become preoccupied and concerned with appearance, become distressed by their perceived anomaly, and also show impaired judgement, in particular social scenarios. They may not be able to successfully function throughout the day, and may actively avoid certain social situations. Generally, subjects who feel that a particular aspect of their appearance is abnormal will not perceive themselves as attractive in comparison to subjects who have no particular issues with their body image (Didie *et al*, 2010).

When the effects of *peer pressure* was compared against the body image question on *preoccupation and concerns*, the results revealed a stepwise increase with those in the *unconcerned* group assigning the *lowest peer pressure* scores. The *extremely concerned* about body image group gave the *highest peer pressure* scores. This suggests that subjects who do have a particular issue regarding their appearance feel more pressure from their peer groups. This would coincide with a body image disturbance. A body image disturbance consumes the individual with concerns and worries due to internal evaluation over their dissatisfaction, and this would be exaggerated when comparing themselves to their fellow peers (Phillips, 1991; Didie et al, 2010). Overall it appears that peer pressure affects individuals when focusing on particular social,

distressing, preoccupation, impairment and avoidance scenarios. The majority of subjects were largely within the younger category: peer pressure and peer influence may have a dominant effect on these particular individuals when focusing on particular body image questions and how individuals view their body image and incorporate these into everyday situations (Roy, 2012; Diedrichs *et al*, 2011; McCabe *et al*, 2001).

5.1.7. PATHOLOGICALLY AFFECTED GROUP

The subjects deemed to have body image disturbances scored 17 and over for the body image questions. 2% of the whole study was within this category this equates to 6 subjects. Out of the six subjects, 4 of the subjects were female. Body image dissatisfaction is higher in women than men (Feingold & Mazzella, 1998). Studies show that exposure to thin ideals from media images increases negative feelings about one's body especially amongst females (Dittmar et al, 2009; Blond, 2008). The body image questions were specifically designed to assess the day-to-day functioning of subjects and to identify if subjects had any particular form of body image dissatisfaction or body dysmorphic disorder. Therefore the process alone of answering the questions makes the subject aware of their particular concerns they have regarding body ideals. This rumination which can be defined as a 'preservative self-focus that is recursive and persistent in nature' (Spasojevic *et al*. 2004) could contribute to the development and maintenance of these body image issues and other related disorders such as depression (Etu *et al*, 2010). The majority of subjects from the pathologically affected group were in the *younger* category with 2 subjects in the *middle* age category. Studies show that body image disturbance and dissatisfaction can affect all age ranges. However, body

image disturbance and dissatisfaction appears to be more prevalent within the *younger* age spectrum (Bilby, 1998). Interestingly, the *younger* age category males and females were all *in a relationship* while the 2 *middle* age category females were not. Studies have indicated that youth is one of the desirable qualities when seeking a mate (Barber, 1995) this could be one of the reasons why the *middle* age category did not have partners.

5.1.8. CORRELATION MATRIX ON BODY IMAGE SCORES AND SELF-RATING OF APPEARANCE, SELF-VERSUS OTHERS, PEER PRESSURE, MEDIA PRESSURE IN GENERAL, BODY MASS INDEX AND MEDIA PRESSURE.

The correlation matrix for the *body image scores* generally showed positive correlations between the questions. This suggests that if the subject answered high on one particular question they answered high on all the particular questions. The same trend was seen for both *males* and *females*.

When total *body image scores* were compared against *self-appearance ratings, self-versus others, peer pressure, media pressure general, body mass index and media pressure* scores findings were varied. Total body image group scores and appearance ratings for *males* and *females* all showed negative correlations. This indicates that the higher the *body image score* appearance ratings dropped. This corroborates current research on body image disturbance and dissatisfaction. People who have body image issues may feel that their particular body image is unattractive and will therefore rate

themselves lower in terms of appearance (Amorose, 2001; Rudiger et al, 2007; Cash, 2002a).

Total *body image scores* and *peer pressure*, revealed a significant positive correlation for *male* subjects but not for *females*. For *males*, the higher the total *body image score peer pressure* effects were increased. Previous research has suggested that females are more concerned with regards to body image pressures and ideals. However a number of studies have revealed that males are similarly affected with some males having desires to be thin and others a desire to be muscular (McCabe & Ricciardelli, 2001). Pressures from environments that focus on appearance appear to have a significant effect on the individual. It has been shown that these individuals who grow up in an environment such as these become more concerned about particular aspects of their appearance and appearance in general (Kluck, 2010). Furthermore, pressure from friends seems to be highly important: many studies have detailed the impact of comments from peers and parents and the consequences of these. For instance self-esteem issues, eating disorders and varying levels of body image dissatisfaction have been reported and impact our thoughts and belief systems (Thompson et al, 2007; Menzel, 2010; Helfert, 2011).

Correlations between *self-rating* of the appearance and *peer pressure* effects revealed a negative correlation for females but not for males. This suggests that subjects who rated themselves higher in terms of appearance did not feel *peer pressure* as much as subjects who gave themselves low appearance scores. We know that women have higher rates of body image dissatisfaction than males which could indicate why females were negatively correlated. If a person does not feel confident within their peer group due to your appearance then this can affect many interactions, such as thoughts and feelings within a peer group situation. Studies have shown that hetero-social

involvement can be associated with body image dissatisfaction and weight management problems in girls (Levine *et al*, 1994; Gondoli *et al*, 2011). For *self-rate* of appearance and *media pressure in general* the total scores and the individual male and female scores were all not significant.

For *self-rate* of appearance and *body mass index* total scores and female scores were significant and negatively correlated and males were not significant. This indicates that the more attractive the subject considers themselves the lower the body mass index. Ample studies have shown that females have a desire to be thin, even females who are already slim have the desire to be even thinner. Studies have shown that women are highly susceptible to body dissatisfaction; even looking at slim models can cause body dissatisfaction. We also know that there are high levels of stigma associated with being overweight, obese and morbidly obese. Therefore subjects who had a lower body mass index would rate themselves higher in appearance as our sociocultural views and trends along with media influence suggest that thin ideals are good and anything else that does not fit into that category is bad (Flegal *et al*, 2010; Thompson *et al*, 1999; Leit *et al*, 2001; Petroff *et al*, 2011). *Self-rate* of appearance and *media pressure* influence on themselves for the total scores and the individual male and female scores were all not significant. Total scores and individual scores for both males and females for self-versus others and peer pressure also had no significant effect.

Self-versus others and *media pressure in general* for the total scores and males showed positive correlation however for females this was not significant. This suggests that the more subjects feel pressure from the media the more they will compare themselves to others. As we know many studies have suggested that the media plays an important role in influencing ourselves with regards to body image ideals. Physiques which are heavily favoured within the media include a muscular v-shaped torso for

males and very slender physiques for women. This constant pressure may cause subjects to compare themselves to others more frequently to identify and reaffirm their body image ideals in comparison to the media ideals and to others (Ricciardelli *et al,* 2000; Gondoli *et al,* 2011). *Self-versus others* and *body mass index* for the total scores and the individual male and female scores showed no significant effect. *Self-versus others* and *media pressure self* for the total scores and the individual male scores showed a positive correlation the female scores were not significant. Again this reaffirms that media is particularly important when making comparisons to others and this affects themselves in particular rather than just a generalised media felt pressure (Ricciardelli *et al,* 2000; Gondoli *et al,* 2011).

There was a positive correlation for the total scores and the individual male scores for *peer pressure* and *media pressure in general,* there was no significant effect for females, this was the same for *peer pressure* and *media pressure self* for the total scores and the individual male scores with females not been significant. This suggests that subjects who felt peer pressure also felt pressure from the media in general and media pressure on themselves. Subjects who feel this pressure may be more susceptible to other societal pressures. We know that particular physiques are favoured within the media for females thin ideals are preferred and for males a v-shaped muscular torso (Ricciardelli *et al,* 2000; Gondoli *et al,* 2011). If subjects do not fit into these particular ideals, and peer groups identify these concerns or subjects find that there peer group puts pressure on them with regarding these issues, then this can re-emphasise body image concerns and dissatisfaction regarding particular aspects of their appearance Flegal *et al,* 2010; Thompson *et al,* 1999; Leit *et al,* 2001; Petroff *et al,* 2011; Garner *et al,* 1980; Maltby *et al,* 2005; Coleman, 1980).

The correlation for *peer pressure* and *body mass index* total scores showed that there was no significant effect and there was no significant effect for male only scores. However there was a significant positive correlation for females. We know that the majority of females have desires to be thin. Within peer groups females will actively compare themselves to each other. Studies have indicated that peer group relationships are vital for the natural development phase into adulthood. Young adults and adolescents will share thoughts, beliefs and ideas, partake in risk behaviours, and conform to their peer group's socially accepted weight and beauty ideals. We know that being overweight or obese is viewed as negative in terms of health, mate selection and current media trends. Therefore, pressure to be thin and pressure to be thin within your peer environment could be deemed as a form of acceptance within your group (Ricciardelli *et al*, 2000; Gondoli *et al*, 2011; Petroff *et al*, 2011; Thompson *et al*, 1999; Leit *et al*, 2001).

Media pressure in general and body mass index for the total scores and the individual male and female scores showed that there was no significant effect. Media pressure in general and media pressure self for the total scores and the individual male and female scores were all positively correlated. This suggests that males and females are affected by media pressure in their day-to-day lives. There is ample evidence to suggest that media is one of the most dominant forces within our society today. Our daily lives are filled with various media sources whether these are books, magazines, film, television, advertising, billboards, catalogues and so on. Our current media trend when focusing on body image and body image ideals portrays slim, tall, attractive females and for males muscular, athletic and handsome. With these constant ideals been focused on us as a society the effects of these pressures from the media influence us

directly (Pope *et al*, 2000; Feingold & Mazzella, 1998; Thompson *et al*, 1999; Garner *et al*, 1980; Stice *et al*, 1994).

Study One assessed a large cohort of staff and student participants on; demographics, body mass index, history of mental illness, exercise, appearance ratings, comparison to peers, media influence and body image questions. These questions designed to assess if any body image concerns caused problems within daily functioning.

The next study was designed to take a further in depth look at stress and how stress may be interlinked within body image concerns. A stress test has been designed to try and identify, if subjects show any physiological changes to a physical and psychological stressor. Physiological changes were assessed using a various techniques such as blood glucose, blood pressure monitoring along with salivary cortisol and sIga collection and analysis. Furthermore, validated instruments such as the Derriford Appearance Scale 59 (DAS 59), Becks Depression inventory (BDI) and a body image interview created from the Study One using the body image questions were used within Study Two. The DAS 59 instrument was used to try and identify if subjects view body image concerns as a disfigurement. The BDI instrument was used to try and identify if there any links between depression in subjects and body image concerns. The body image interview was used to assess if subjects fall within to displaying features of those with a somatoform disorder i.e. body dysmorphic disorder.

CHAPTER SIX

6.1. STUDY TWO

6.1.1. OVERVIEW OF STUDY

Stress is one of the most attributed factors associated with body image concerns and disorders, including Body Dysmorphic Disorder, Anorexia Nervosa and Bulimia Nervosa in adolescents and adults (Murray *et al*, 2011; Ata *et al*, 2007). Stress and immune function associated with body image will be investigated in Study Two.

Stress is one of the most accountable contributors to disorders such as depression. Therefore, we measured various physiological markers which are known to be indicators of stress i.e. cortisol and sIgA and carried out a series of measurements focusing on depression, body image perceptions and body disfigurement. This was to investigate if stress has influences on body image perceptions from a sample of the population.

The research was carried out in two studies. Study Two entails an in-depth examination of stress, body image perceptions and disturbance, comparing these with validated instruments: one which is designed to assess participants' mental health status, the other which assesses if a person perceives themselves as disfigured rather than having a body image disturbance. These psychological measurements along with physiological measurements are further assessed to try and determine if stress was an underlying characteristic of body image disturbance.

6.2. GENERAL INTRODUCTION

The word ‘stress’ has developed into an everyday term, but yet remains without explicit definition. The common use of the word has been applied to a multitude of scenarios in many subject areas including: politics, geology, biology and everyday laymen’s terms. Many people today comment on how ‘stressful’ their daily routine lives are. Stressful situations could include, the 16 year old pupil entering the examination hall to take GCSE’s, single mothers/fathers struggling to survive daily routines of balancing finances, children, and work; the high pressured investment banker striving to maintain margins and financial goals. Emotional circumstances contribute to stress, as do other factors, including: environmental changes, such as temperature variations i.e. excess heat or extreme cold, and actual physical changes i.e. blood loss, illness and trauma.

A stressor creates a fight or flight response in which the individual prepares to either defend or avoid a particular situation. Confronted by a predator the body prepares one to deal with that situation (Selye, 1978). Walter Canon was one of the first scientists who proposed the emergency theory of the adrenal glands; we now call this ‘fight or flight’. He found that exposure to a stressor caused the adrenal medulla to increase the blood levels of adrenaline as a means of adapting to the stress (Cannon, 1919). Scientists around that time (1911) already had a basic knowledge that adrenal secretion was controlled via the thoraco-lumbar autonomic system and understood that during an organism’s response to a threatening situation physiological changes would occur (Randall, 2004). The physiological changes include pupil dilation and increased heart rate which are all linked to sympathetic pathways (Cannon, 1919). Cannon injected adrenaline into cats and noticed profound body changes that mirrored those of stress

(Cannon, 1911). From here the notions of 'fight or flight' and homeostasis were founded. The conclusion of Canon's work emphasized that an optimum environment was required for our bodily systems to work both efficiently and effectively. External situations which disrupt this optimum environment cause profound physiological changes (Randall, 2004).

In 1936, Hans Selye began testing a possible new hormone from extracts of ovarian tissue on rats. Selye compared rats that were injected with saline as control to rats that were given a newly isolated hormone. Selye found that repeated injections over time resulted in peptic ulcers, adrenal hypertrophy and changes in the thymus and spleen. These changes developed in both the control group and the experimental group. Selye concluded that the effects of the daily stress of injections and handling caused these changes and pathologies (Selye, 1978).

Selye continued to study the effects of stress on rats, examining hypothermia. Rats were housed in low temperatures for periods of 2 days, 2 weeks or 2 months. The rats housed in cold conditions for 2 days showed evidence of hypertrophy of the adrenal cortex, and reduced eosinophil count. The thymus, spleen and lymph nodes displayed atrophy. At 2 weeks, the rats no longer exhibited any of the above symptoms; therefore Selye concluded that the rats had now acclimatised to the cold temperatures. The rats could also withstand even colder temperatures without exhibiting any adverse symptoms. Finally, the rats which were exposed for 2 months of cold temperatures lost any required resistance to the temperature and died. Selye coined the idea of the "General Adaptation Syndrome" based on his observations (Selye, 1978). The General Adaptation Syndrome is comprised of three distinct phases. These are the alarm reaction; the diminish phase; and finally, the exhaustion phase.

The alarm reaction - changes are mediated through cortisol and adrenaline and affect a wide variety of tissues. As mentioned previously, the alarm reaction phase would coincide with Selye's experimental procedure on the effects of hypothermia. The rats which were housed in cold temperatures for 2 days would exhibit the typical symptomatology of the first initial stage.

The diminish phase - tissues become accustomed to the high levels of cortisol and adrenaline; the response to the effect of the hormones is diminished.

The exhaustion phase - the tissues lose the ability to respond to the stressor. The exhaustion phase was demonstrated in the rats exposed to cold temperatures for 2 months. The rats displayed no stress responses to the cold temperature. Their tissues had become exhausted and had no further capacity to respond, ultimately resulting in death.

Stress alters our homeostatic environment, and the hypothalamo-pituitary-adrenal (HPA) axis is the main physiological system via which an organism elicits a response to stress. This causes defensive protocols to be activated. Medullary catecholamines and the adrenal glucocorticoids act as the primary protective system.

6.2.1. HYPOTHALAMIC-PITUITARY-ADRENAL (HPA) AXIS

In addition to the catecholamine actively demonstrated by Canon, another physiological system which responds to stress is the hypothalamic-pituitary-adrenal (HPA) axis. Hormones from the hypothalamus act on the anterior pituitary, stimulating hormone secretion. The pituitary secretagogues in turn act on the adrenal gland cortex to

release cortisol. The HPA axis has a diurnal circadian rhythmicity of cortisol fluctuation (Meaney *et al*, 1993).

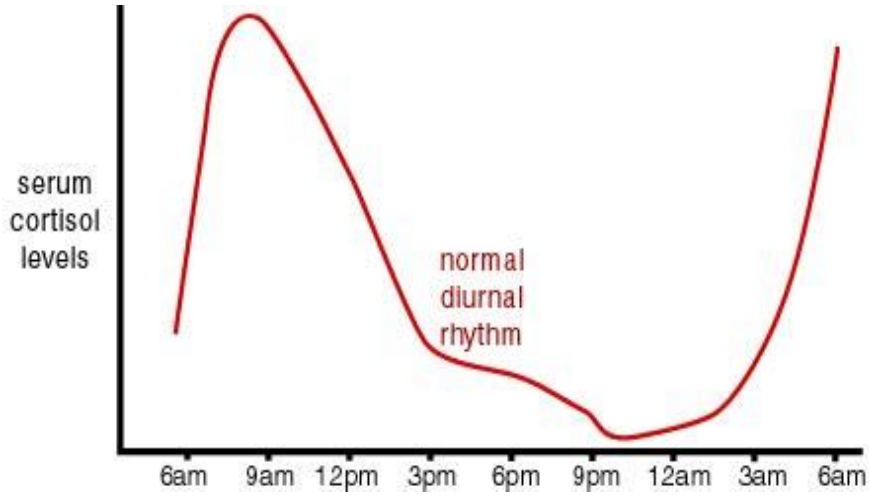

Figure 6.1 This graph represents the circadian rhythm for cortisol over a 24 hour cycle in humans (http://www.endocrinesurgeon.co.uk/adrenals/adrenals1-4-1.html).

As can be seen in figure 6. 1, humans have the highest release of plasma cortisol just after waking in the morning accompanied by feeding and motor movement (Krieger, 1974). A study by Prussner *et al* (1997) showed that the method of awakening from sleep is a stimulus and activates the HPA. The study showed that salivary cortisol is low just at the point of waking and then increases significantly over a period of 30 to 45 minutes. This response is independent of the amount of sleep and the particular time of waking up, and regardless of post awakening activity. Throughout the day there is an inexorable decline of cortisol albeit with a slight surge in the late afternoon. The lowest point is at the point of starting to fall asleep and levels remain low throughout the night (Sapolsky, 1992). In nocturnal animals such as rodents, the highest release of corticosterone is in late afternoon which coincides with nocturnal foraging. Krieger, (1974) showed that feeding and water restrictions also shifted the release pattern of

corticosterone in the rat. Therefore not only does light and dark exposure influence the circadian rhythm, but food and water intake alter the rhythm.

When mammalian homeostasis is threatened by a stressor the adrenal glucocorticoids and medullary catecholamines provide the frontline defence processes (Selye, 1978). These hormones are endocrine regulators of lipid and carbohydrate metabolism. Glucocorticoids inhibit sex hormone secretion and parasympathetic nervous system activity (Sapolsky, 1992). They have effects on a variety of tissues, raising cardiovascular tone, increasing energy for muscle function, suppressing the immune system, and altering behaviour. These examples are the more dominant effects that take place during a stress response; inhibition of amino acid uptake, liberation of fatty acids and reduced glucose storage within the liver occur as well (Sapolsky, 1992). The increases in blood fats and plasma amino acids promote gluconeogenesis and glycogenolysis, thereby enhancing energy substrates for coping with the metabolic demands of the stress.

The HPA axis is the chief regulatory pathway for the release of hormones during a stress response. The paraventricular nucleus (PVN) within the hypothalamus contains parvocellular cells; these cells release corticotropin-releasing hormone (CRH). The CRH neurons project down to the portal capillary zone of the median eminence. The neurons form a potent excitatory pathway for the synthesis and release of adrenocorticotropic hormone (ATCH) from the anterior pituitary (Meaney, 1983; Dallman *et al*, 2000; Watson *et al*, 2006). This hormone along with other hormones such as arginine vasopressin (AVP) and oxytocin (OT) are the chemical signals that code the neural inputs into endocrine signals via the pituitary corticotrophs. ACTH release changes with alterations in the level of secretion of these secretagogues from the hypothalamic neurons (Plotsky *et al*., 1984).

The diagram below figure 6.2 shows a simplified version of the HPA axis system of CORT during the hormonal cascade.

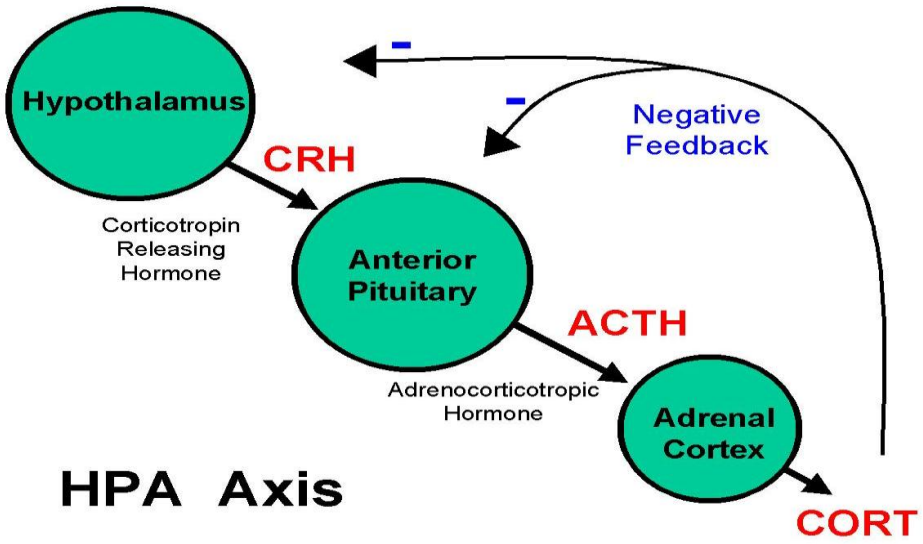

Figure 6.2 HPA axis (http://www.biology.ucr.edu/people/faculty/Garland/HPA_axis.jpg).

The HPA axis itself is very sensitive to stressors; elevated secretion of CRH, along with secretagogues AVP and OT, initiates the synthesis and cleavage of pro-opiomelanocortin. Pro-opiomelanocortins a polypeptide from which many different neurohormones, which include ACTH, Lipotropin hormone (LPH), melanocyte - stimulating hormone (MSH), α endorphins and met-enkephalin are cleaved. ACTH and LPH are cleaved in the pars distalis within the anterior pituitary (Antoni, 1986).

The diagram below figure 6.3 shows the cleavage sequences of MSH, ACTH, -LPH, -END and MET-ENK hormones that can be derived from Pro-opiomelanocortin.

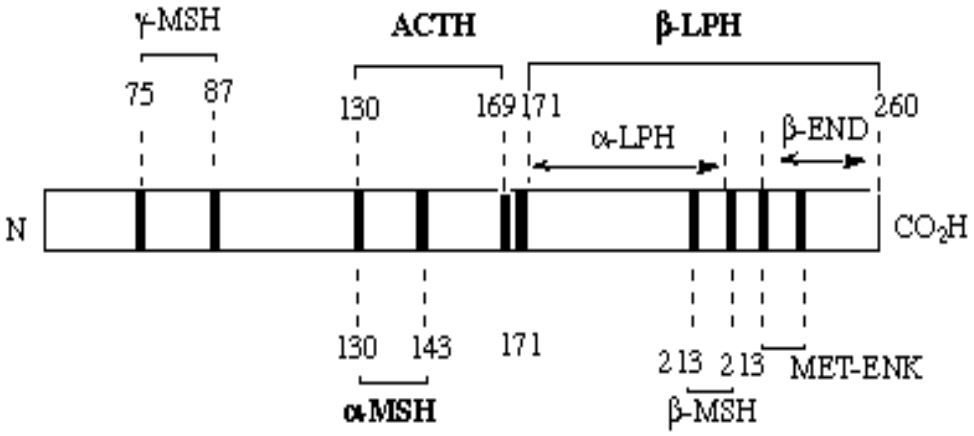

Figure 6.3 Pro-opiomelanocortin and cleavage patterns (http://www.neurosci.pharm.utoledo.edu/MBC3320/ACTH.htm).

When ACTH is released into the circulatory system, it up-regulates the synthesis and secretion of cortisol from the adrenal gland. In humans following a major stressor, circulating cortisol levels may rise 300%, whereas in rodents a 10 fold increase of circulating hormones has been recorded (Meaney, 1993). Cortisol, a catabolic glucocorticoid induces lipolysis, increases free fatty acids and triglyceride levels, promotes gluconeogenesis and further increases blood glucose levels; additionally cortisol suppresses immune system responses, such as inflammation, which need to be suppressed if motility is required (Munck, 1984). These elevated levels of glucocorticoids within the body during a stress response had previously been depicted as enhancing the animal's resistance to stress.

However, Munck (1984) proposed that many systems become active during stress including cellular signal and transduction mechanisms such as prostaglandins, arachidonic acid metabolites, neural proteases, lymphokines and bioactive peptides. These chemical messengers probably organise, recruit and co-ordinate cellular

responses to stress. However, some enzyme activation is not so helpful when stress occurs; for example glutamine synthase, which is rapidly induced by glucocorticoids, can result in cellular damage. Furthermore, global damage also occurs if glucocorticoids remain elevated, because elevated triglycerides, hypercholesterolemia, growth problems, muscle atrophy, reduced insulin sensitivity and other consequences may result. Thus stress is linked to heart disease, diabetes, immune problems and reproductive failure. Therefore, it is essential that once the stressor has ceased the HPA axis should be inhibited (Munck, 1984).

The inhibition of the HPA axis is controlled principally by circulating glucocorticoids binding to high affinity steroid receptors to control CRH/ACTH release via negative feedback loops. The feedback works by the circulating glucocorticoids entering certain brain areas, including pituitary and limbic areas, and suppressing the synthesis and release of CRH and ACTH (Plotsky et al., 1984; Dallman *et al*., 1992). Other structures involved in the regulation of the HPA feedback mechanism include: the medial-basal hypothalamus, and the hippocampus. The hippocampus is a very important structure and has significant involvement with the HPA axis. The hippocampus is located in the temporal lobe and its name originates from the Greek language: the translation in English is ‘seahorse’. The name represents the anatomical appearance of the hippocampus. Studies on the hippocampus have shown damage or removal of the hippocampus impairs cortisol mediated negative feedback of ACTH suppression (Plotsky *et al*., 1984). The hippocampus is exquisitely sensitive to glucocorticoids and has the highest receptor concentration sites for glucocorticoids and mineralocorticoids (Sapolsky et al., 1984).

In response to high levels of glucocorticoids, the hippocampus acts principally as an inhibitory authority which feeds back to the HPA axis and regulates both basal and

stress induced release of corticosterone. There are two steroid receptor types that are sensitive to cortisol: these are: Type I (mineralocorticoids) and Type II (glucocorticoids) receptors (Reul *et al*., 1985). Glucocorticoid receptors are involved in the stress response; however mineralocorticoid receptors have multiple functions which are not necessarily related to stress. Cortisol has a greater affinity for the MR, but its principal site of action is the GR; this is due to the presence of 11-beta hydroxysteroid dehydrogenase type II enzyme which catabolises cortisol into its relative inactive form cortisone, at the MR site. The MR is targeted largely by aldosterone and other mineralocorticoids, while GR are left exposed to the circulating cortisol. The mineralocorticoids are primarily involved with the regulation of electrolyte and water balance (Keller, 2006). When cortisol is released, it circulates within the bloodstream and targets specific tissues throughout the body. They bind to GR and form a ligand-receptor conjugate which translocate into the nucleus and regulates genomic events. GC's can therefore increase or inhibit transcription of particular gene expression and this is their primary mechanism of action (Sapolsky, 1992).

As discussed previously, the mechanism of HPA axis inhibition is mediated by a negative feedback system sensitive to circulating cortisol which targets, amongst others, hippocampal GRs. The involvement of the hippocampus in HPA axis regulation is of importance for the reasons germane to this thesis. The hippocampus is a key brain region long known to be required for memory and learning functions, and thought to regulate mood and affect. The integration of hormones, stress and mood disorders, along with learning by the hippocampus may well provide the neural basis or indeed proof of the complex interplay, hypothesised between body image, stress and depression.

As previously mentioned there appears to be many contributing factors associated with the developmental, psychological, physiological, and environmental factors linked to depressive. Evidence suggests that the nurturance of the offspring is of paramount importance. Previous research has shown that neonatal handling in rat pups is associated with increased serotonin turnover the hippocampus. This in turn results in changes in sensitivity and density of the glucocorticoid receptors involved in the negative feedback system. Other studies have shown that 5-HT metabolism disruptions may be linked to depression. (Van Praag, 2004). It has been shown that electroconvulsive therapy and antidepressant treatment increase the efficiency of 5-HT transmission in particular at the 5-HT_{1A} receptor. This is increased by the sensitization of the post synaptic or desensitization of the presynaptic receptor for 5-HT systems (Blier & DeMontigny, 1994). Furthermore, depletion of tryptophan, which is a precursor for 5-HT, has been shown to reduce 5-HIAA levels in CSF (Delgado *et al*, 1989). When tryptophan depletion was induced into human subjects it was shown to alter mood. This was especially found within subjects who had a history of depression (Young *et al*, 1985; Benkelfat *et al*, 1994). 5-HT receptor disturbances have been found to be related with depression. Serotonin receptors range from 5-HT_1 to 5-HT_7 and 5-HT_1 subtypes. The family consists of four subgroups 5-HT_{1A} to 5-HT_{1D}. In particular 5-HT_{1A} has been associated with anxiety and aggression both of which are readily displayed within mental illness. 5-HT_{1D} hyposensitivity has been shown to be associated with aggression and anxiety. Finally, 5-HT_{2C} has been associated with anxiety (Van Praag, 2004). As depression is one of the main co-morbid factors associated with stress and body image disturbances, and its related psychopathologies, it is important to understand how depression co-exists with body image disturbance disorders (Phillips *et al*, 1997).

6.2.2. PHYSIOLOGICAL MARKERS WHICH INDICATE A STRESSOR RESPONSE

The physiological markers that indicate a possible stress response can be easily assessed in subjects. When a stressor occurs, cardiovascular tone and blood pressure increase (Canon, 1911). Alongside increased cardiovascular tone, heart rate also increases. Recent studies on animal models have found that there may be different brain regions activated by different stressors as indicated by the expression of intermediate early genes (Senba & Ueyama, 1997).

A study by Oshima *et al* (2001) measured both systemic and processive stressors. The systemic stressor was a cold presser test which was cold exposure at 4 centigrade for 10 minutes, and a mental arithmetic test. They found that the cold exposure caused more distress than the mental arithmetic test and elevated systolic and diastolic blood pressure. The mental arithmetic test seemed to increase pulse rate, but did not elevate blood pressure. They also showed no significant changes in ACTH and cortisol under each stressor during the DEX/CRH test.

One way to assess an individual's stress levels is to measure changes in blood pressure in response to a stressor. Blood pressure is a force that can be measured by a maximum (systolic) and minimum (diastolic) exertion on the walls of the blood vessels just prior to and after a heartbeat. Blood pressure is usually measured on the upper arm and is recorded at the brachial artery and radial artery.

6.2.3. RELATIONSHIP BETWEEN IMMUNE SYSTEM AND DEPRESSION

The relationships between the immune system, stress, and depression have been reported on since the 1980's. However, New Scientist magazine (2001) brought to the public's attention a detailed report of the possible link between the immune system, stress and depression. The article's opening paragraph discussed how a fifty year old women residing in Japan had become infected by the hepatitis C virus. The patient was given an effective immune boosting drug in order to help combat the virus; however the patient encountered severe side effects. The patient became unpredictable in her behaviour and subsequently declined into a melancholic state. The onset of these symptoms was so severe that the patient attempted to commit suicide (New Scientist, 2001).

Similar reports to this have been brought to light detailing examples whereby people became severely depressed after taking immune boosting drugs such as alpha interferon and interleukin-2. As mentioned previously, stressful life events and the role of stressors may invoke depression; this likelihood is again exacerbated in genetically pre-disposed individuals. This, coupled with a poor ability to cope with psychosocial factors and situations, predicts the outcome and likelihood of depression in people (Caspi *et al*, 2003). The complexities of the underlying mechanisms are somewhat intricate, and depression is a biochemically heterogeneous disorder. But exactly where does the immune system become involved? Evidence suggests that the peripheral immune response is interlinked with acute stressors. Some studies have shown natural killer cells and cell activity increases along with helper T-cells. B cells remain constant or start to decline during these particular tasks (Delahanty *et al*, 1996; Willemsen *et al*, 2002).

Acute stress influences mucosal immune responses (Willemsen, 1998). Secretory Immunoglobulin A (sIgA) activation is one way in which to measure the first line of defence in mucosal surfaces. The mucosal surfaces are persistently exposed to various airborne, sexually transmitted and ingested agents (Johansen &Per Bradtzaeg, 2004). This antibody safeguards against foreign microbes and protects mucosal surfaces in a various ways: 1) foreign microbes and their adhesion is interrupted at mucosal surfaces; 2) blocking foreign microbes from traversing across epithelial surface; 3) at the basolateral surface the mucosal epithelial complexes with the antigen at the lamina propria and facilitates its removal via exocytosis in the lumen of the mucosa; and 4) it reclaims routes at interstitial and intracellular levels (Mazanec *et al*, 1993).

In homo sapiens, IgA is found to have two subclasses, IgA 1 and IgA 2. These subclasses are characteristically different in their amino acid sequence and glycosylation of their alpha chains. The subclasses also differ at different mucosal sites. IgA 1 is usually found in serum as the predominant component (approximately 90%). IgA 2 is found as the predominant component in mucosal secretions (Delacroix *et al*, 1982). This is due to the varying dispersion of immunocytes that produce the immunoglobulins (Johansen &Per Bradtzaeg, 2004). Salivary IgA (sIgA) is created in the salivary gland within the plasma cells. The acinar/duct cells in the basolateral site of the salivary gland are transferred by secretory component (SC) dependent transport to the luminal site (Mostov, 1994). Plasma cells in the salivary gland that produce the sIgA are initially created by a precursor cell. For example in the mucosal associated lymphoid tissue (MALT), the B lymphocytes travel to here via the lymphatic system, pass into the blood, and then travel to the salivary gland (MacLennan & Gray, 1986).

Stress is thought to be involved in infections in mucosa such as occur in upper respiratory tract infections (Marcenes & Sheiham, 1992). Salivary IgA is known to be

sensitive to levels of stress. It has been shown that salivary cortisol and sIgA increase in individuals after acute stress compared to basal levels of salivary cortisol and sIgA (Evans *et al*, 1994). This has been observed in soccer coaches, in air traffic controllers during laboratory based computer game tasks (Kugler *et al*, 1996; Zeier *et al*, 1996; Carroll *et al*, 1996), during cold presser tests, and mental arithmetic tests. It is thought that stressors reduce humoral immunity, but enhance mucosal and cell immunity, and that involvement of the sympathetic adrenomedullary (SAM) axis may be involved. Support for this is apparent given that autonomic system blockade diminishes acute stress responses (Keller *et al*; 1988; Wang *et al*, 1994). This is reactivated once the sympathetic nerve is directly stimulated (Okamoto *et al*, 1996). It has been shown that acute stress challenges increases NK cells and their activities, CD8+ ve and cytotoxic T cells, and that these changes are transient and quick (Herbert *et al*, 1994). It is known that chronic stress causes inhibition of the immune system, in particular psychological stress inhibits cytokines such as interleukin-1 (IL-1), interleukin-6 (IL-6) and tumour necrosis factor-α (TNF-α) by a number of process through gene expression, transcription, translation including (post) translation, secretion of proteins and cellular proliferation and differentiation (O'Connor *et al*, 2000). GC's can alter mRNA production of cytokines by two mechanisms. (Bamberger *et al*, 1996). GC's can directly inhibit transcription of the genes for IL-6, along with IL-1β and indirectly GC's can act via suppression of pro-inflammatory transcription factors e.g. nuclear factor-*κ*B (NF-*κ*B) and activating protein-1 (AP-1). NF-*κ*B is located in the cytoplasm and can be stimulated by many external stressors such as infections and antigens. NF-*κ*B is attached to I*κ*Bα and I*κ*Bβ when activation occurs and this then allows NF-*κ*B to move into the nucleus. It then attaches to the sequence of target genes via the promoter regions. This, in turn, elicits the expression of cytokines and adhesion molecules, as

with simultaneous activation of IL-1β and TNF-α, resulting in inflammatory reactions (Barnes, 1998; Baldwin, 1996; Barnes, 1997). The stress response activates CRH release and locus coeruleus-norepinephrine neural activity. Both of these systems function as negative feedback loops, therefore, CRH is stopped by cortisol as are Substance P, POMC, GABA-BDZ and various other opioids. CRH production can be elicited by 5-HT, ACH, AVP, LC/NE cell activity and proinflammatory cytokines. CRH production leads to AVP secretion both of which activate ACTH eventually leading to cortisol secretion. TNF-α, IL-6 and IL-1 are key components in the activation of CRH production. These cytokines instigate their own production, and IL-1β and TNF trigger the manufacture of IL-6. IL-6 inhibits IL-1β and TNF production and works alongside GC's to activate hepatic secretions, and also acute phase proteins. GC's stop the production of these cytokines, however IL-6 appears to be more resilient than TNF-α to the effects of GC's (O'Connor *et al,* 2000) The main cytokines involved as possibly contributing to psychopathologies such as depression are: IL-1, IL-2, IL-6 and TNFα. There is general agreement that stressors affect and change our hormonal homeostatic environment, and coupled with neurochemical alterations create conditions where depressive illness can flourish (Anisman et al, 2002). Proinflammatory cytokines are the initial immune responses in any threat from infections, and IL-1 is the primary cytokine detected in the brain (Vitkovic *et al,* 2000). Cytokines are in essence signalling molecules which can manifest changes within the CNS. Cytokines may gain entry to the brain from the periphery in two ways. These are: 1) prostaglandins and nitric oxide formation released by microglia into the CNS; and 2) afferent and efferent fibres of the vagus nerve establish a direct link. They can then transfer where the blood brain barrier (BBB) is less restrictive.

Early studies have shown that sIgA is sensitive to stressors (Evans *et al*, 1995). However acute stress has been shown to cause the opposite effect on the immune system and sIgA is seen to be elevated following acute stress (Evans *et al*, 1997). However the relationship between sIgA and its involvement in HPA axis function show that it could be linked with the circadian rhythm of cortisol. One particular study which looked at sIgA circadian levels revealed that morning levels were higher than afternoon levels (Miletic *et al*, 1996). Hucklebridge *et al* (1998) looked at the relationship between sIgA levels and salivary cortisol levels just after waking and across diurnal cycles. They found that when cortisol increased during awakening, sIgA decreased, and these were significantly correlated with the sIgA fall (r=0.42). Moreover, sIgA was found to have a diurnal cycle similar to cortisol with an am rise and subsequent decline over 6 hours. Chronic stress has been shown to upset cellular immunity, inhibit T-cell proliferation induced by mitogens, and reduces reaction from T-cell-dependent antibodies along with cytokine secretion inhibition (Dhabhar & McEwen, 1997; Silberman *et al*, 2002; Zhang *et al*, 1998; Fukui *et al*, 1997).

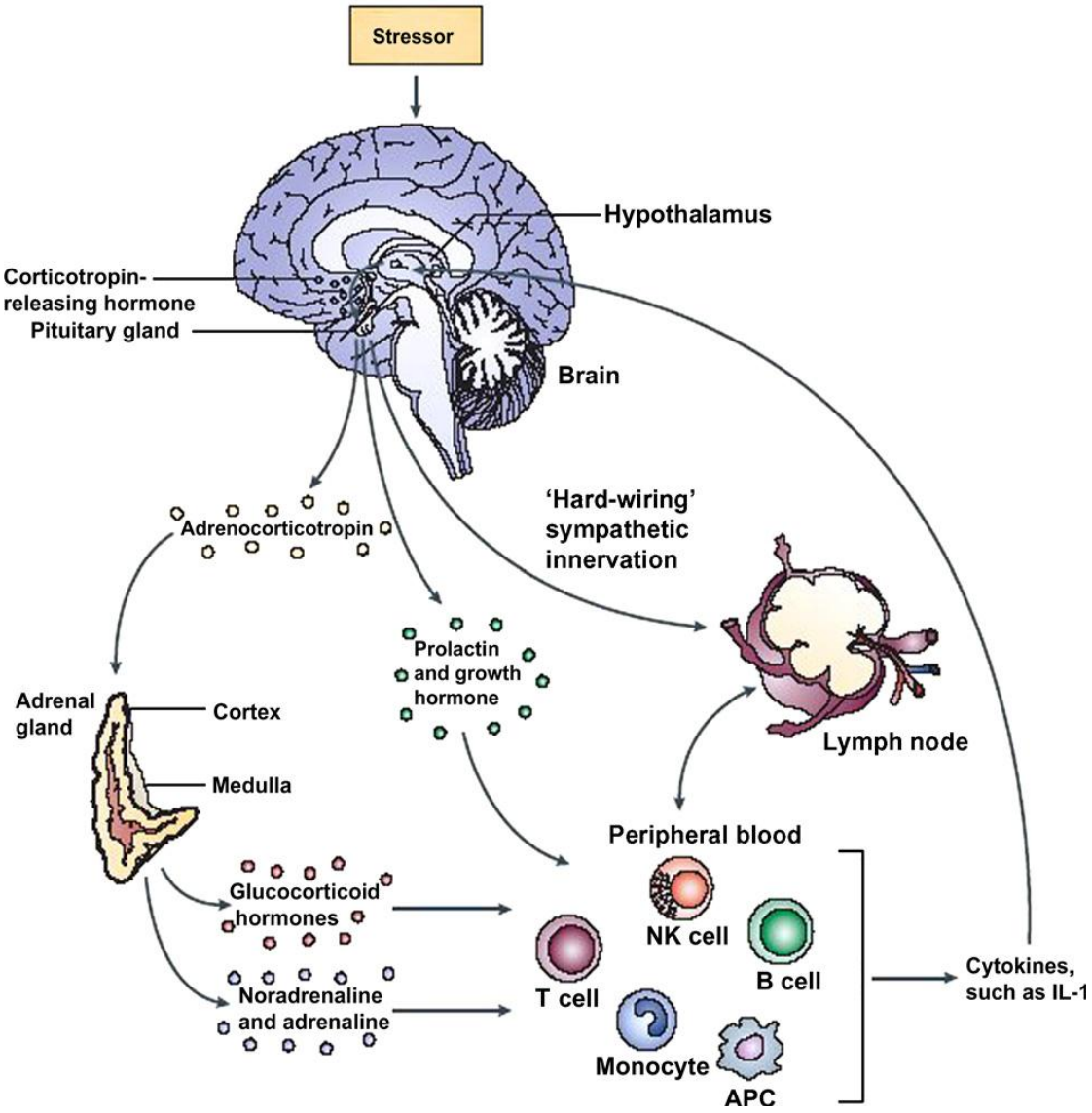

Figure 6.4 Stress activation via hormonal response by the CNS. HPA and SNS cause GC and catecholamine release. This results in modulation of the immune system. Prolactin and GH also play a role in the modulation of the immune system. Figure taken from (Marketon & Glaser, 2008)

Depressive symptoms appear concomitantly with abnormalities of three major neurotransmitters: these are dopamine (DA), norepinephrine (NE) and serotonin (5-HT). Not only have neurotransmitter activities been found to be different in depression, but also that of the receptor sites (in particular 5HT1a, 5-HT2 and a1-NE and b-NE) (Schatzberg *et al*, 1995). Serotonin has been investigated extensively. It has been shown that depletion of 5-HT exacerbates depression (Biler, 2003). Other research has shown that 5-HIAA levels in the cerebral spinal fluid (CSF) of suicide victims are diminished,

and this has also been observed in people who have attempted suicide. Autopsy of suicide brains reveal abnormalities in the prefrontal cortex, in particular the orbital and dorso medial cortex (Drevets, 2001). These changes within the brain include alterations of both glial cells and neuronal cells, revealing a reduction in cyclic AMP (cAMP) and its ability to bind with protein kinase A. Furthermore, there is a reduced amount of PKA activity in the brain of suicide victims (Dwivedi *et al*, 2002), and increased $5HT_2$ receptor levels. This evidence points to reduced 5HT activity, indicated by lower 5HIAA levels, and $5HT_2$ receptor up regulation as a compensatory response.

6.3. AIMS & OBJECTIVES

6.3.1. AIM

Following on from Study One. Study Two looks at an in depth view of body image and the role of stress. The aim of this research is to investigate whether or not physiological markers of stress vary amongst subjects professing body image concerns as possible precipitating or predictive factors in psychopathology.

6.3.2. OBJECTIVES

1. To gather physiological measurements on subjects in response to an acute physiological stress challenge (submerging subjects' hands in ice-water), or in response to a heightened emotional state (psychological stress) elicited by answering emotive questions on depression, body image and disfigurement. Basal physiological measures will be recorded from subjects at the beginning of the test session, which will be followed by either the cold-water stress or the emotive, psychological stress. Markers of stress activity will include blood pressure, blood glucose concentration, salivary cortisol levels, and the immunity marker sIgA (salivary immune-globulin A). Following the stress challenge, the same physiological markers will be recorded again.

2. Examine whether or not subjects who are categorised by the demographic information gathered in Study One, give similar responses with regards to depression, body image and disfigurement. Acute measures of mood will be assessed using the Beck Depression Inventory (BDI), while attitudes about body image will be determined

by using questions from Study One that maximally discriminate high/low responders. Attitudes and self-reflection on body image, as these relate to views on disfigurement, will be recorded using aggregate scores from the Derriford Appearance Scale.

CHAPTER SEVEN

7.1. METHODS

Please refer to page Study One methods section for detailed information on ethical approval and demographic information on staff and student population at the University of Bradford.

Demographic features of Study Two are presented in tables Table 3.3, Table 7.2 and Table 7.3. Of the total 60 subjects, 1 participants results were discarded from the study because they omitted to state their gender. Female subjects numbered n=28 of the total, while male subjects numbered n=31.

Age Category	Age Range (Years)	% of subjects
Young	18-25	47.4
Middle	26-40	37.2
Older	>41	15.2

Table 7. 1 Shows the age categories assigned within Study Two.

Demographics	% of subjects
Caucasian	54.2
Asian	33.8
Black	6.7
Chinese	1.6
Other	3.3

Table 7. 2 The demographics for the participants for Study Two.

Age	Ethnicity	Gender	% of subjects
Young	Caucasian	Male	6.7
		Female	13.5
Young	Asian or British Asian	Male	10.1
		Female	6.7
Young	Black or Black British	Male	1.6
		Female	3.3
Young	Chinese	Male	0
		Female	1.6
Young	Did not state Ethnicity	Male	0
		Female	1.6
Middle	Caucasian	Male	10.1
		Female	10.1
Middle	Asian or British Asian	Male	8.4
		Female	5
Middle	Black or Black British	Male	1.6
		Female	0
Middle	Chinese	Male	0
		Female	0
Middle	Did not state Ethnicity	Male	1.6
		Female	0
Old	Caucasian	Male	6.7
		Female	5
Old	Asian or British Asian	Male	3.3
		Female	0
Old	Black or Black British	Male	0
		Female	0
Old	Chinese	Male	0
		Female	0
Old	Did not state Ethnicity	Male	0
		Female	0

Table 7. 3 The ethnicity, age and gender demographics for Study Two.

7.1.1. PARTICIPANT DEFINITION

(a)Inclusion Criteria:

The inclusion criteria were agreed as follows.

1) Males and Females would be included in the study.

2) All ethnic backgrounds were eligible.

3) All subjects had to be legally consenting adults.

(b)Exclusion Criteria:

The Exclusion Criteria were agreed as follows.

1) Subjects with insufficient English language skills were not accommodated because we had no interpreters.

2) Individuals who refused to sign the consent form for any reason.

3) Subjects diagnosed and under current treatment for any mental disorders.

7.1.2. SUBJECTS & SAMPLE SIZE

60 subjects agreed to participate in this study. Subjects were opportunistically recruited from the students, staff and visitors at the University of Bradford. All subjects were assessed during the period of September 2007 -December 2009.

7.1.3. PROCEDURE

This study was conducted by the use of questionnaires investigating body image, disfigurement and depression. Biological materials i.e. saliva, along with demographics such as ethnicity, age and gender were collected. Blood pressures and blood glucose levels were tested before and after a psychological and a physiological stress test. All assessments were carried out at the University of Bradford. Please refer to Appendix III for explanatory statement and consent form, Appendix IV for the assessment sheet, Appendix V for the data collection sheet and Appendix VI for the body image interview used within Study Two.

A small private room was utilised for this experiment. The room was non-threatening, with a private working space for the participants to complete the questionnaires without any distraction. The layout of the room enabled the investigator to have easy access to the participants as biological measures needed to be recorded at specific time intervals.

The schematic representation of the layout of the study area which was used in Study Two.

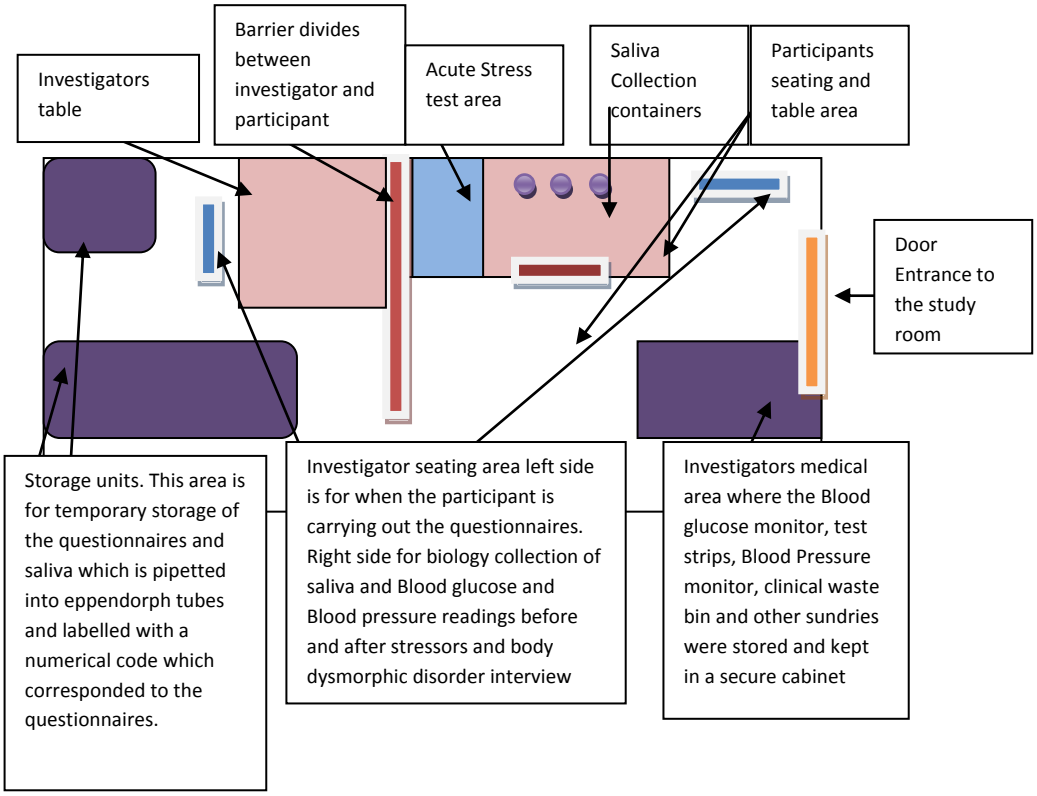

Figure 7.1 Diagrammatic representation of the room schematics for Study Two

The room was kept the same throughout the whole experiment in Study Two. Out of the 60 subjects, 15 subjects had to re-schedule due to work commitments. The participants table was cleaned and 3 saliva containers marked 1, 2 and 3 were placed on the participants' top half of their desk. Research on collection of saliva sample was conducted in a pilot study previous to this. It was found that the best method to collect the samples was using a standard, plastic disposable cup. This allowed the participants to easily produce the sample without the need for chewing, and its small circumference seemed less difficult and more hygienic to use as compared to other methods attempted. The acute stressor for this study consisted of ice water. The container used for this was rectangular (length was 40ins and the width was 15ins). Three of the containers sides

was 6ins in height and the remaining side were 3ins in height allowing the subjects to easily place their hands into the container without having to hold their arms in an awkward manner. The container was filled with 3 parts crushed ice and 1.5 parts water. The container was placed at the right hand side of the participants in every experiment. All necessary instruments were placed within easy reach of the investigator to access as and when required during the acute stress response and experiment: the instruments used were an electronic blood pressure monitor, 3 blood glucose strips, 3 glucose prick pens, 3 alcohol wipes, sterile wipes, and paper towelling. All subjects arrived between 5 and 10 minutes prior to their agreed time. On arrival the subjects were greeted and seated in the participants' seating and table area. An explanatory statement was given to the participants to read and was explained in detail to the subjects verbally. The explanatory statement (see Appendix) detailed the overview of the experiment along with the reasons why the experiment was taking place, and the inclusion and exclusion criteria. The investigator explained all aspects of the experiment, and the procedural outlines were then explained with regards to the acute stressor test. It was made clear at the beginning that all information collected in this study was completely confidential and that all information was stored in a secure locked cabinet in a secure office and that the only members who could access this information was the principle investigator and the secondary investigator. If the subjects agreed to these terms and conditions, then a separated consent form was signed and dated, and placed in a secure container. Out of all 60 participants none wished to stop. A total of 27 people while recruiting refused to carry out the experiment due to time constraints, or other matters that they did not comment on.

7.1.4. EXPERIMENTAL PROCEDURE

After all the forms were read and signed the first recording of blood pressure, and blood glucose, measures were recorded. The subjects were then asked to place a saliva sample into cup marked number 1. The second part of the experiment was the acute stress response. The participants placed their right hands, submerged completely into the iced water, for a maximum of 2 minutes. Participants were allowed to remove their hand at any time out of the iced water if the discomfort was too great. After the stressor, a second recording was collected of blood pressure, and blood glucose. At this point each participant was then asked to place a second saliva sample into the cup marked number 2. The participant was then assessed in an interview format on body image and dysmorphic questions then given the, Becks Depression Inventory and the Derriford Appearance Scale 59 instruments. This was used as the psychological stressor once the subject had completed the interview and instruments they then gave a final saliva sample in cup marked number 3 along with a blood pressure and blood glucose check.

Blood pressure readings and blood glucose readings were recorded at the same time points as the saliva collections. The readings were recorded on a data collection sheet corresponding to each subject using a unique reference number. The saliva samples were collected in plastic cups marked Phase (1) pre-stressor - (basal levels, prior to the subject placing their hand in iced water). Phase (2) post-stressor - after 2 minutes the subject removed their hand out of the iced water and recordings were again taken of blood glucose, blood pressure and saliva. Finally, phase (3) post-stressor 60 minutes – Subjects produced final samples of blood glucose, blood pressure and saliva. All saliva samples were aliquoted into two 1 ml eppendorf tubes and marked with the subjects corresponding unique reference. Each eppendorf tube contained approximately 350-500µl saliva. The samples were divided for separate Cortisol and sIgA ELISA assays.

The saliva samples were then immediately stored in a -80^{o}C freezer, until assay at a later time.

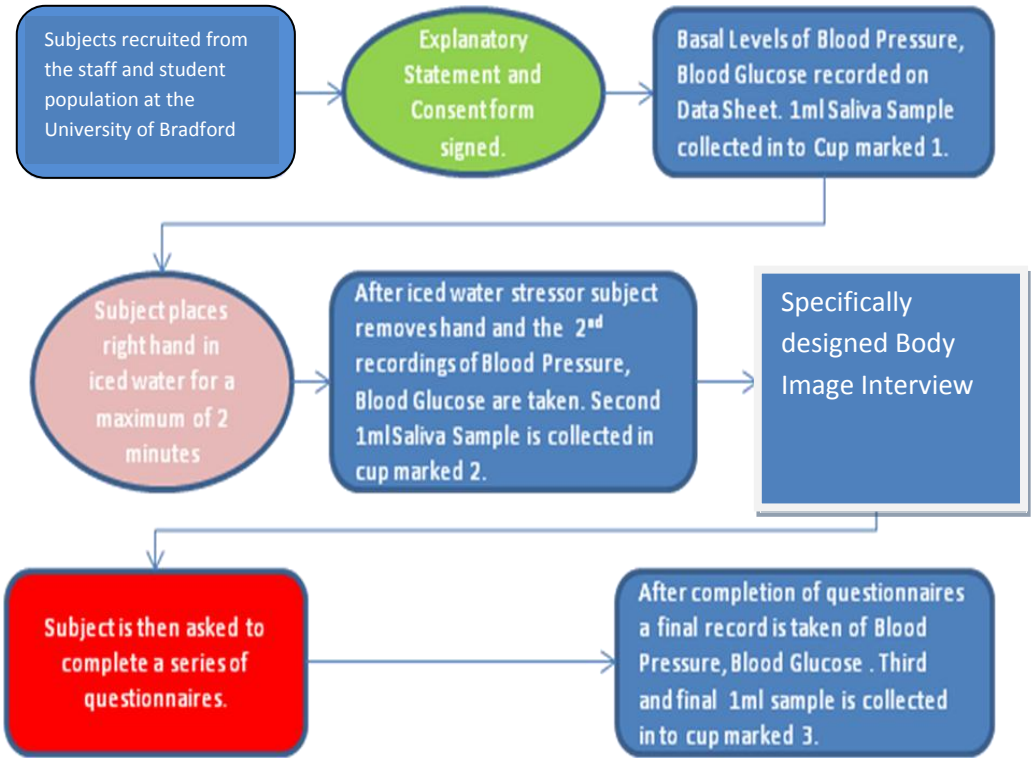

Figure 7. 2 This diagram details the step by step processes involved in the assessment of each subject in Study Two.

After phase 2, and before phase 3 of the stress test, the participant completes a series of questionnaires and an interview. The questionnaires consisted of the Becks Depression Inventory, Derriford Appearance Scale and the specifically designed questions which were answered in a semi-structured interview process.

7.2. QUESTIONNAIRES

Due to copyright laws copies the Becks Depression Inventory (BDI) and the Derriford Appearance Scale (DAS 59) have not been included within this thesis.

7.2.1. BECKS DEPRESSION INVENTORY (BDI)

The Becks Depression Inventory (BDI) was created by Aaron T. Beck and first appeared in 1961. The Inventory consists of a 21 item multiple choice, self-report. The questionnaire is one of the most widely used instruments for determining how severe a subject's level of depression is. There have been three revised BDI's over the years with the first inventory revision in 1978 termed BDI-1A, and then a revision later in 1996 termed BDI-II.

The BDI is not a long term assessment instrument; it is designed to assess how the individual feels and has felt in the last week. A statement is presented at top of the first page and says please circle the appropriate number that corresponds to how you are currently feeling. Underneath, the participant is given a choice ranging from 0, 1, 2 and 3 and this scale increases in the level of severity: so for example response criteria for the first question is as follows; 0, I do not feel sad. 1, I feel sad. 2, I am sad all the time and I can't snap out of it. 3, I am so sad and unhappy that I can't stand it. Each multiple choice question should be circled to that which most resembles the current feelings of the individual. The questionnaire is designed to assess participant's current feelings regarding multiple aspects of their life and how they respond to these questions

determines their level of depression severity. The depression score is based on the aggregate score for all 21 questions.

The scoring for the BDI is broken down into three levels of severity. If a subject scores 0-9 then they are not depressed. Subjects who score within the 10-19 range are considered to have mild to moderate depression. Subjects who score >19 are considered to have moderate to severe depression.

7.2.2. DERRIFORD APPEARANCE SCALE (DAS 59)

The DAS 59 was created by David Harris, Tony Carr and Timothy Moss as a tool to engender an all-inclusive assessment looking at appearance disturbances in people's daily lives. The questionnaire was designed to concentrate on the themes of social interactions and self-esteem. The assessment focuses on the emotional impact and turmoil one faces when dealing with one's personal anguish over perceived appearance problems.

The DAS 59 is a three page assessment: the first page of the assessment concentrates on obtaining demographic information along with ascertaining aspects of the participants' concerns regarding appearance along with other peripheral concerns they may have. The questionnaire uses the term 'feature' when regarding the physical attribute or imagined problem that the participant is concerned with. The questionnaire consists of 57 items and is a scale system, and these items identify psychological suffering and dysfunction. There are 2 items which focus on physical suffering and physical dysfunction; these are items 25 and 26 in the questionnaire. The scale system is a numbered rating system which requires that the subjects circle the most appropriate response. The rating scale starts from (1) Almost Never, (2) Sometimes, (3) Often, (4) Almost Always and finishes with Not Applicable (NA) option. This scoring system only applies to item 1 to 33. The second page assesses the severity of behaviours which relate to avoidance issues within daily life and routines, and personal feelings with regard to inadequacy. The scoring system is altered in this section and ranges from (1) Not at all distressed, (2), (3) Moderately distressed, (4), (5) Extremely distressed and finally Not applicable (NA). For scores 2 and 4 it is incumbent on the participant to decipher between the lower score explanation and the high score explanation. The third

page centres on emotional suffering in response/interactions with others and the perceptions of the participants appearance concerns or issues in regards to daily routine and living. The questionnaire in this section measures how avoidance is used as a coping strategy in daily routines and living as a result of appearance issues. The closing questions concentrate on self-notion and living with appearance concerns and issues.

The creation of the DAS principally started with a 136 itemed questionnaire that was departmentalized into three fundamental areas. The three areas were established from phraseology of participants from an autobiographical study of a large representative sample of plastic surgery patients who had physical disfigurements (Harris, 1982). The questionnaire was then tested for its validity in a sample of plastic surgery patients.

The questionnaire is designed to be carried out independently by the patient/participant. The duration of the questionnaire is dependent upon the subjects, but usually takes approximately between 10 and 15 minutes to complete.

7.2.3. DERRIFORD APPEARANCE SCALE – MEASURES & SCORING

The DAS 59 measures problems with appearance and the impact this has on a person's adjustment to appearance concerns. The DAS 59 targets and identifies negative emotions of varying factors including: fear, social anxiety, shame, withdrawal and avoidance, and how these and their frequency contribute to disruptions in routines and day-to-day living.

The DAS 59 formulates six measures: these include a full scale score and a five factorial sub scale score that looks at psychological suffering and dysfunction along with physical suffering and dysfunction (25 and 26 item).

The factors which the Derriford Appearance Scale assesses are:

- General Self-consciousness of appearance (GSC)
- Social Self-consciousness of appearance (SSC)
- Sexual and Bodily Self-consciousness of appearance (SBSC)
- Facial Self-consciousness of appearance (FSC)
- Full Score (FS)

The higher the respondent's level of distress, the higher the score, conversely lower scores indicate less distress within the respondent. Each factor applies the same scoring system. In order to calculate scores, items have to be reordered in to each factorial sub-scale and then added together for the final value excluding items 25 and 26, which are full scale scores. To look at the full scale score, all numbers are added together excluding item 25 and 26. The higher the scores, the higher the participants' levels of distress, concern and dysfunction over appearance issues. Furthermore, to determine if Study Two participants were normally distributed Z scores were calculated and compared with norms tables from the Derriford Appearance Scale 59 manual.

7.2.4. DERRIFORD APPEARANCE SCALE 59 - NORM TABLES FOR GENERAL POPULATION & CLINICAL POPULATION

The tables below are the norms tables from the Derriford Appearance Scale 59 (DAS 59) instrument gathered form previous research findings. This data supplied was incorporated within the DAS 59 manual.

Age 18-30 yrs	F-S	GSC	SSC	NSC	SBSC	FSC
Female Mean (n=153)	69.7	25.2	14.9	10.9	12.5	2.4
Male Mean(n=107)	61.2	20.9	14.9	7.0	12.0	2.4

Table 7.4 Shows the Norm values for Male and Female of the General Population – All Respondents age range 18-30 years.

Age 31-60 yrs	F-S	GSC	SSC	NSC	SBSC	FSC
Female Mean(n=313)	58.5	21.4	10.9	8.2	12.6	1.9
Male Mean(n=236)	47.4	14.0	11.4	5.6	10.9	1.9

Table 7.5 Shows the Norm values for Male and Female of the General Population – All Respondents age range 31-60 years.

Age 18-30 yr s	F-S	GSC	SSC	NSC	SBSC	FSC
Female Mean (n=98)	80.1	33.9	17.3	14.1	13.9	2.6
Male Mean (n=107)	72.6	32.6	20.6	9.9	13.6	3.2

Table 7.6 Shows the Norm values for Male and Female of the General Population – Concerned about their appearance age range 18-30 years.

Age 31-60 yrs	F-S	GSC	SSC	NSC	SBSC	FSC
Female Mean (n=189)	82.3	32.9	16.1	12.5	14.0	2.7
Male Mean(n=236)	76.9	28.6	18.4	9.6	13.0	2.8

Table 7.7 Shows the Norm values for Male and Female of the General Population – Concerned about their appearance age range 31-60 years.

Age 18-30 yrs	F-S	GSC	SSC	NSC	SBSC	FSC
Female Mean (n=440)	115.7	43.9	28.6	15.4	20.4	3.2
Male Mean(n=167)	97.4	36.3	25.9	14.9	12.3	3.3

Table 7.8 Shows the Norm values for Male and Female of the Clinical Population – All Features about their appearance for those awaiting aesthetic plastic surgery age range 18-30 years.

Age 31-60 yrs	F-S	GSC	SSC	NSC	SBSC	FSC
Female Mean (n=638)	104.7	41.1	24.1	14.8	17.8	2.9
Male Mean(n=121)	89.1	33.8	22.4	14.5	10.9	3.0

Table 7.9 Shows the Norm values for Male and Female of the Clinical Population – All Features about their appearance for those awaiting aesthetic plastic surgery age range 31-60 years.

7.2.5. INTERVIEW - BODY IMAGE

The body image questions which were used in Study One were adapted into an interview format. Respondents were asked to respond either '*yes*' or '*no*' to each question. The questions centred on aspects concerning appearance, degree of preoccupation and concerns, concerns over distress, functioning and impairment, social setting concerns and avoidance concerns. Please refer to appendix for the Interview questions.

7.2.6. SALIVA SAMPLE ASSAY PROCEDURE - SALIVARY CORTISOL ELISA

The saliva samples were thawed and brought up to room temperature immediately prior to assay. The Salivary Cortisol ELISA assay kit form DRG Diagnostics GmbH, Germany was brought up to room temperature (as stated in the manufacturer user's manual). The wash solution was made up to a final dilution of 1200 ml. The wash solution vial contained 30 ml of stock to which was added 1170 ml of deionized water.

7.2.7. SAMPLE PREPARATION & PROCEDURE

In order to separate the mucins, samples were centrifuged at 3000 rpm for 10 minutes. The samples and the cortisol standards were aliquoted into the appropriate well (100 µl) of a 96 well micro plate. Once all the wells had both the cortical standard and

human samples, 200 µl of the cortisol conjugate was added to each of the wells and the plate was vortexed for 10 seconds. The wells were then incubated for a period of 60 minutes at room temperature. After the incubation period, the contents of the wells were discarded and then rinsed with 400 µl of wash solution for 3 consecutive rinses. Following the wash sequence 200 µl of substrate was added to each well and a further incubation period of 30 minutes at room temperature followed. After the incubation time had elapsed, 100 µl of a stop reaction solution was added to each well.

7.2.8. SALIVARY CORTISOL ELISA SAMPLE ANALYSIS

The plate reader provided optical densities based on colourimetric changes in the enzyme reaction in each of the wells. Each cortisol unknown was compared to a standard control based on a liner regression of standards, 0, 2, 5, 10, 20, 40 and 80 ng/ml. Unknowns were then calculated and converted to cortisol values. Normal range in adults is 0.12-1.47µg/dl or 1.2-14.7 ng/ml.

7.2.9. SALIVARY IGA ELISA

The saliva samples were thawed and brought up to room temperature immediately prior to assay. The assay kit supplied by DRG Diagnostics GmbH was also brought up to room temperature at the same time. IgA assay buffer was diluted with 160 ml deionized water in a storage flask to make a final volume of 200 ml. 1 ml of the diluted

IgA assay buffer was then transferred into a separate glass tube and 50 µl of stock solution was added to the 1 ml IgA assay buffer. This was mixed on a rotating mixer at low speed for duration of 5 minutes (this quantity of dilute conjugate is directly proportional to the number of tests carried out). For this experiment, the full quantity was diluted: the enzyme conjugate amount used was 0.7 ml and this was diluted into 14 ml of the IgA assay buffer. Wash solution was then prepared to make a final volume of 1000 ml. Wash solution (20 ml) was added to deionized water to make a final volume of 1000 ml.

7.2.10. SAMPLE PREPARATION

Saliva was allowed to flow down a plastic straw into a centrifuge glass tube. All samples were then centrifuged at 3000rpm for 15 minutes. Once centrifuged, samples were diluted in two stages. For every saliva sample, 2 sterile glass test tubes were prepared. Each test tube was marked with permanent marker with dilution A and dilution B.

Dilution A received 50 µl of liquid supernatant and 950 µl of the diluted IgA assay buffer. All Dilution A glass test tubes were mixed on a rotating mixer for a total of 5 minutes. For Dilution B 20 µl from the Dilution A test tube was removed and placed into the Dilution B test tube then 980 µl of diluted IgA assay buffer was then added to B tubes. All Dilution B test tubes were then placed on a rotating mixer for a total of 5 minutes. This created a final dilution of 1:1000.

7.2.11. PROCEDURE

Samples were assayed in duplicate for each standard and sample, and one blank well after each duplicate sample was left empty. 25 µl was added of both the standard and the samples were pipetted into each well. 100 µl of the diluted conjugate was then added to the standards and samples. The sample, standards, and blanks were then left to incubate at room temperature (24^{o}C) for 60 minutes. After the incubation period had elapsed, each well had it contents removed and was washed with diluted wash solution. 300 µl of wash solution was used in each well and the wash was repeated 3 times each time. After washing and draining, TMB substrate solution (H_2O_2-TMB 0.25 g/L) was pipetted (100 µl) into each of the drained wells including the blanks. The plate was left to incubate at 24^{o}C for 15 minutes in the dark. After this incubation period, 100 µl of stop solution was added to every well.

7.2.12. SALIVARY IGA ELISA SAMPLE ANALYSIS

The plate reader provided optical densities based on colourimetric changes in the enzyme reaction in each of the wells. The plate was read at 450 nm against the blank. Calculation of the mean absorbance for the standard curve and each sample was determined. The absorbance was then plotted on linear graph paper versus the h-IgA concentration in µg/ml and a best line of fit was plotted. Average absorbance was the calculated for unknown samples and unknown sample absorbance values were located on the vertical axis. The corresponding concentration was taken from the horizontal axis on the graph in µg/ml for each of the unknown samples. Normal values range from 40-170 µg/ml.

CHAPTER EIGHT

8.1. RESULTS – STUDY TWO

Figure 8.1 shows that out of the 60 participants (1 omitted due to incomplete data) there were 28 *female* and 31 *male* participants who completed Study Two. The main proportion of participants were categorised within the *younger* category (n=28), followed by the *middle* category (n=22), and finally the *older* category (n=19). Out of these 59 participants the distribution of ethnic types was *Caucasian* (n=32), followed by *Asian/British Asian* (n=20), *black/black British* (n=4), *Chinese* (n=1) and *other* (n=2).

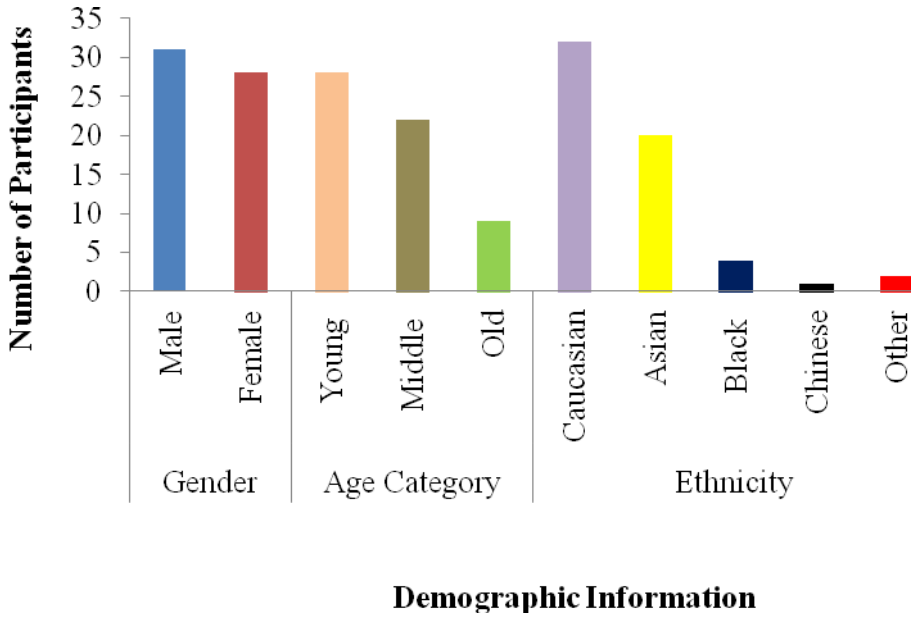

Figure 8.1 Distributions for gender, age categories and ethnicity for Study Two participants.

8.1.1. GENDER AND BECK'S DEPRESSION INVENTORY (BDI) SCORES

Figure 8.2 illustrates *female* and *male* scores for *BDI*. As is evident *females* showed higher *BDI* scores than did *males*. ANOVA on the data showed a significant effect of gender on *BDI* scores ($F(1,56)=5.094$, $p<0.05$. The average *female* scores ranged within the mild to moderately depressed, category whereas the average *male* participants were in the not depressed category.

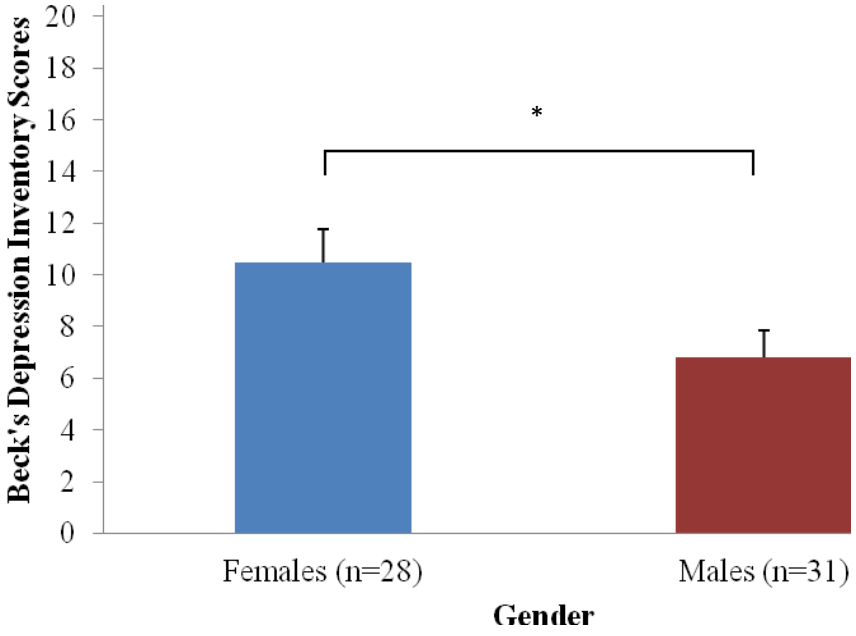

Figure 8.2 This graph depicts BDI values for females and males for the 59 participants. Data shown represents as means ± SEM.

8.1.2. HISTORY OF MENTAL ILLNESS AND BECK'S DEPRESSION INVENTORY SCORES

Figure 8. 3 shows the relationship between prior *history of mental illness* and *BDI* scores. As is evident subjects who responded *yes* (i.e. had a prior mental health history) showed much higher *BDI* responses in comparison to subjects who had *no* prior mental health illness. ANOVA on these data and *BDI* scores showed a significant effect with ($F(1,56)=4.710$, $p<0.05$. These subjects with a prior mental illness fell within the Mild to Moderately depressed range. Respondents who had *no* prior mental illness fell within the non depressed range.

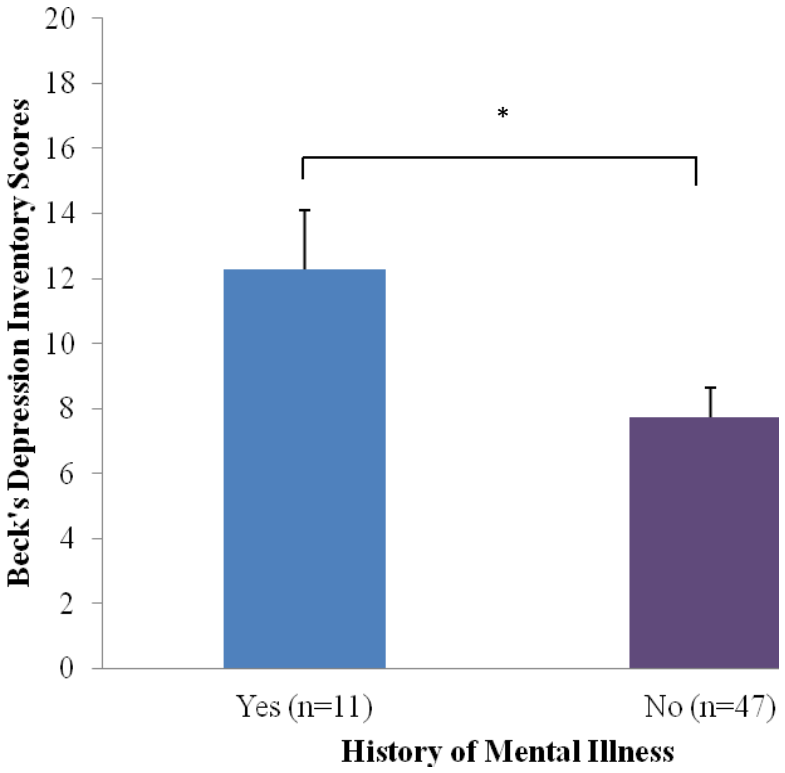

Figure 8.3This graph depicts BDI values for females and males with or without a history of mental illness. The data shown is are means±SEM.

8.1.3. STRESSED DURING THE DAY AND BECK'S DEPRESSION INVENTORY SCORES

Figure 8. 4. illustrates respondents' *BDI* scores and their experience of *stress during a typical day*. As is evident, subjects who replied that they were experiencing *stress during the day* showed much higher values for *BDI* Scores in comparsion to subjects with minimal stress or no stress. ANOVA examining the degree of stress and *BDI* scores showed a significant effect with ($F(2,55)=15.318$, $p<0.0001$. The results of post-hoc comparisons are detailed on figure 8. 4.

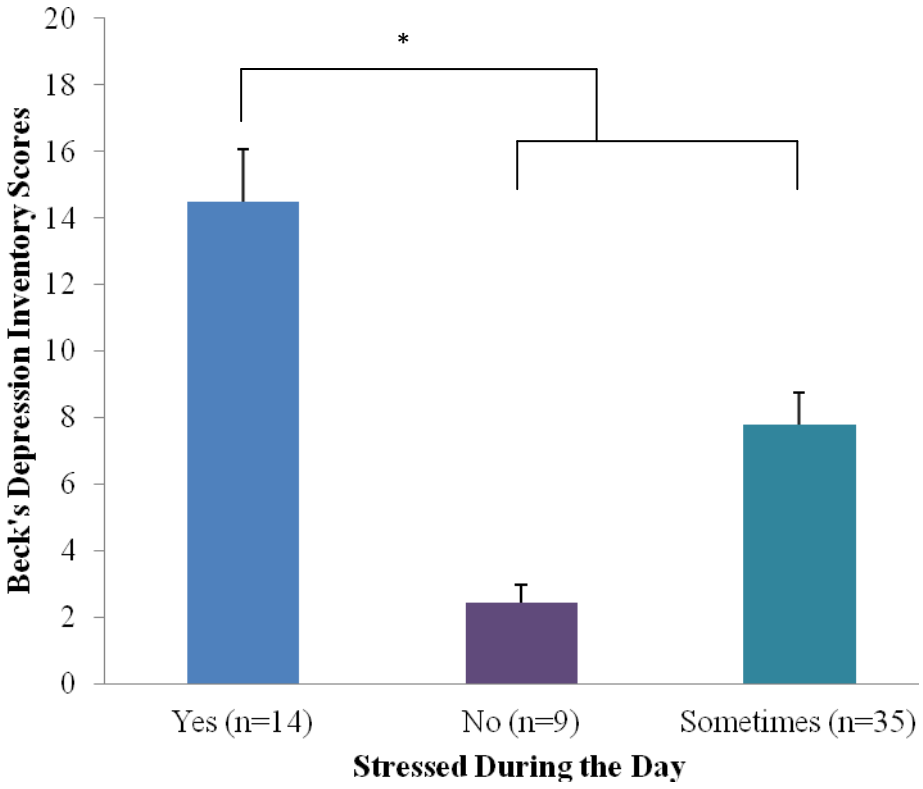

Figure 8.4 BDI values and a degree of stress during a typical day. Subjects either selected Yes, Noor Sometimes in response to the question on 'do they experience stress during the day?'. Data shown are means ±SEM.* significantly different from the No stress and Sometimes stressed categories Bonferroni/Dunn test <p0.05.

8.1.4. BECK DEPRESSION INVENTORY & CONCERNS OVER SLIMNESS

Figure 8. 5 illustrates *BDI* scores and respondents *concerns over slimness*. As is evident respondents who responded positively to having such concerns showed higher *BDI* scores in comparison to respondents who had *no concerns over slimness*. ANOVA on these data reveal a significant effect of *concerns over slimness* with corresponding BDI scores ($F(1,54)=7.220$, $p<0.05$.

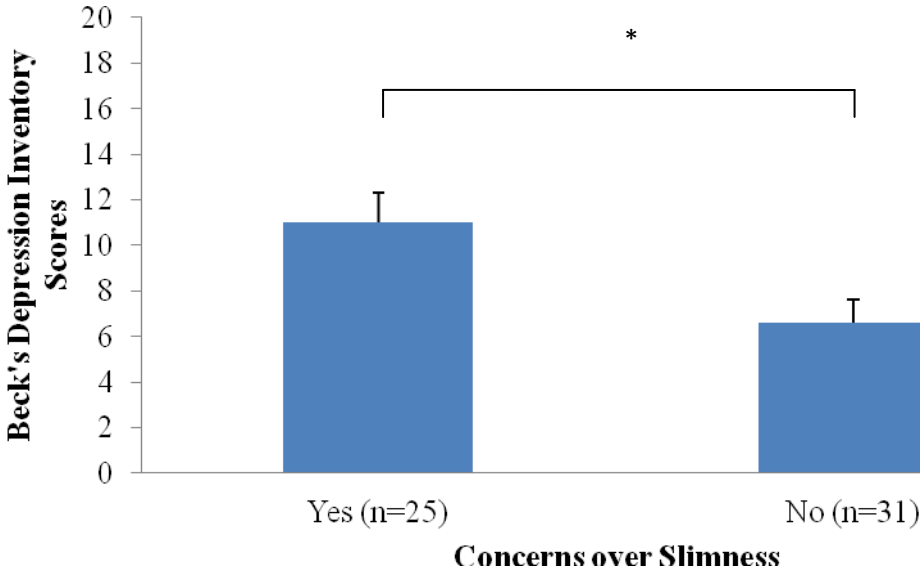

Figure 8.5 BDI values in subjects with or without concerns over slimness. Data shown are means ± SEM. See text for details of the statistical analysis * p<0.05.

8.1.5. BECK'S DEPRESSION INVENTORY AND PREOCCUPATION & CONCERN

Figure 8. 6 graphically depict subjects' *preoccupation & concerns* regarding their appearance and *BDI scores*. As is evident, respondents who said they did have concerns showed higher *BDI scores* in comparison to those respondents who said they had no such concerns. ANOVA for these data revealed a significant outcome of *preoccupation & concern* on *BDI scores* ($F(1,54)=18.588$, $p<0.0001$.

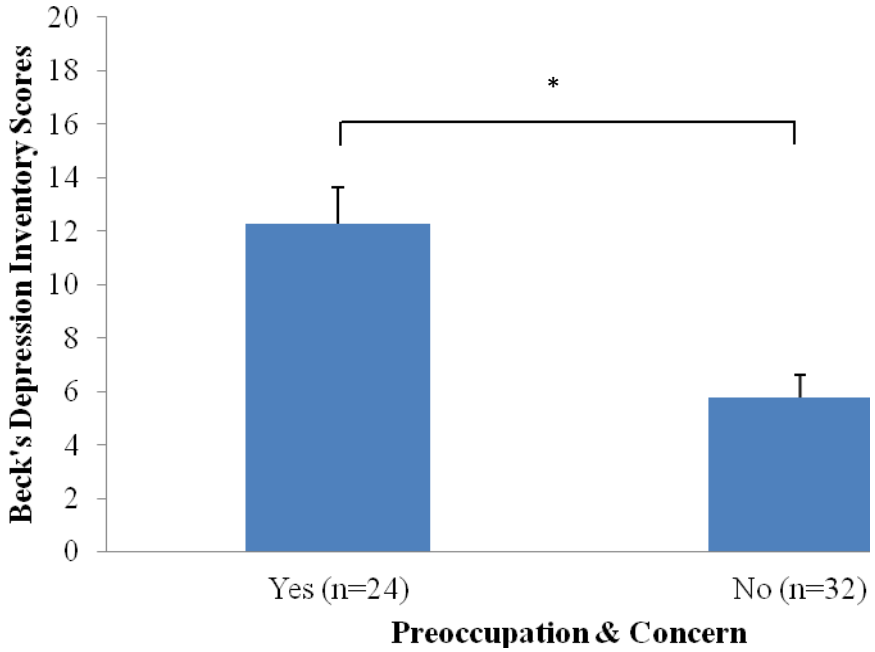

Figure 8.6 BDI values in participants with or without concerns over their appearance. Data shown are mean ± SEM. See text for details of the statistical analysis * p<0.05.

8.1.6. CORTISOL RESPONSE

Figure 8. 7 illustrates the effects of either a *physical stressor* or *psychological stressor* and *cortisol* response. The ANOVA revealed no significant effect with (F(2,56)=1.353, p: NS.

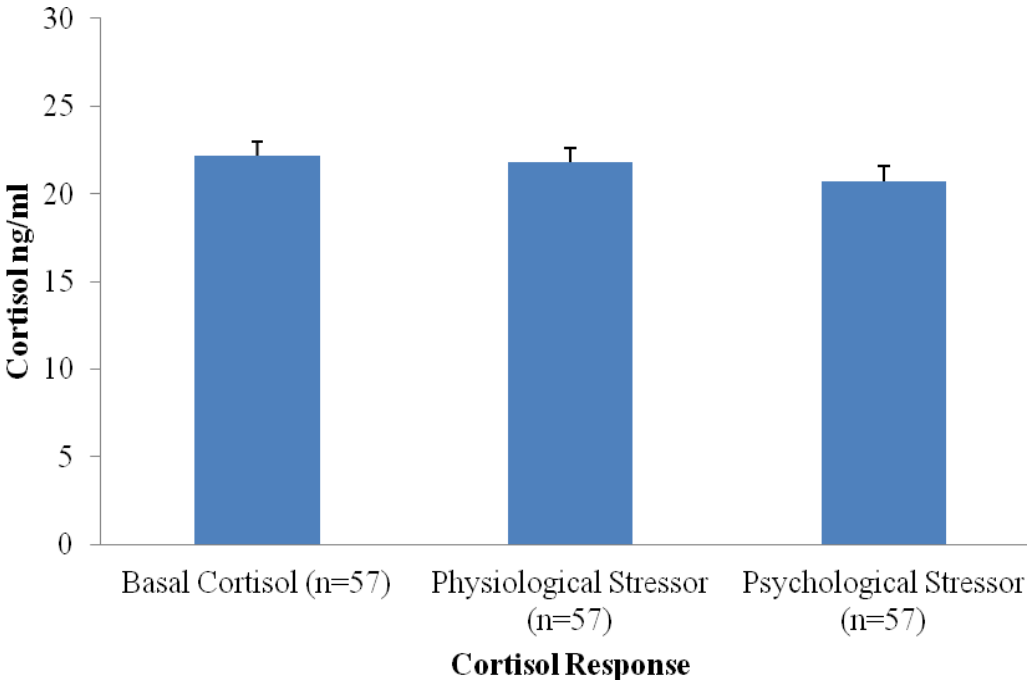

Figure 8.7 This graph depicts cortisol levels following either a physical stressor or a psychological stressor. Data shown are mean ± SEM.

8.1.7. SALIVARY IMMUNOGLOBULIN A (SIGA)

Figure 8. 8 illustrate the effects of either a *physical stressor* or *psychological stressor* and *sIgA* response. As is evident there was an overall significant effect of stress on *sIgA* levels. ANOVA revealed a significant effect of stress with ($F(2,55)=15.029$, $p<0.0001$. Significant group comparisons were found between the *basal* and *psychological* stressor condition and *physical* stressor and *psychological* stressor condition.

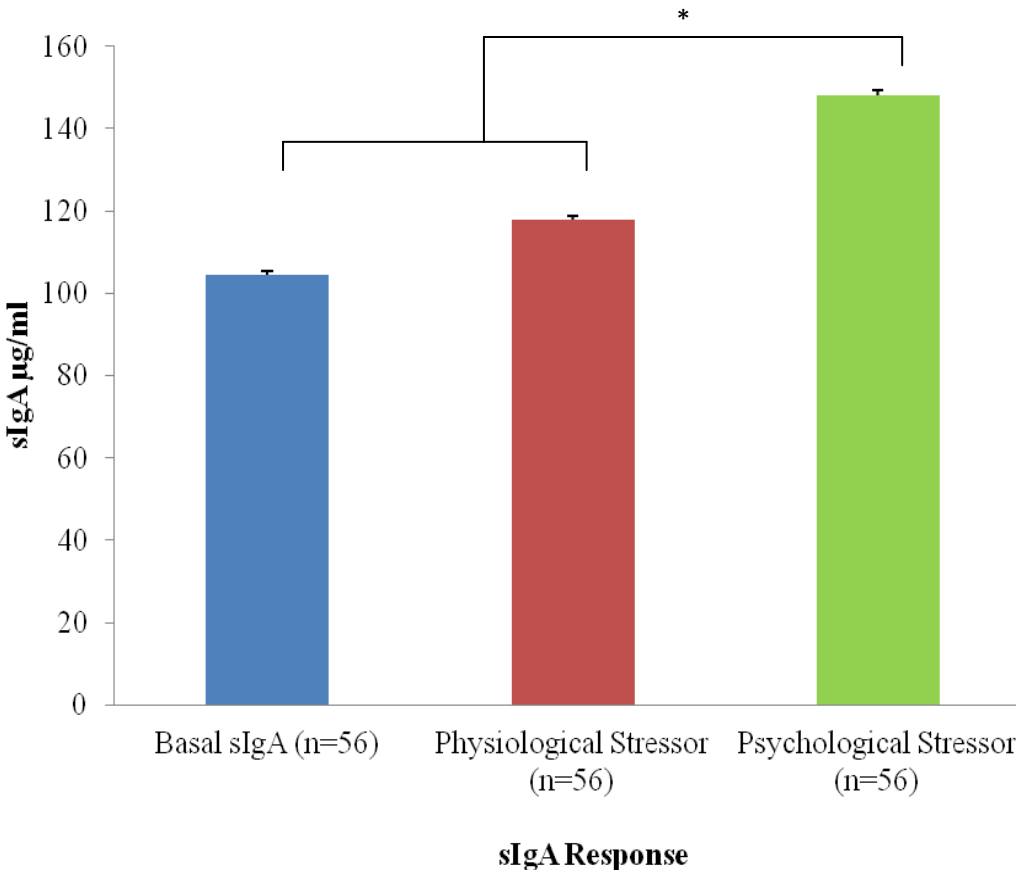

Figure 8.8 This graph depicts sIgA levels following either a Physical Stressor or a Psychological Stressor. Data shown are means ± SEM. * significantly different from the other 2 groups, Bonferroni/Dunn p<0.05.

8.1.8. sIGA RESPONSE & BECK'S DEPRESSION INVENTORY RANGES

Figure 8. 9 illustrate the *sIgA* response i.e. *basal*, after *physiological stressor*, after *psychological stressor*, *age* group and the *BDI* ranges overall. This data was not significant (F(4,55)=0.442, p: NS.

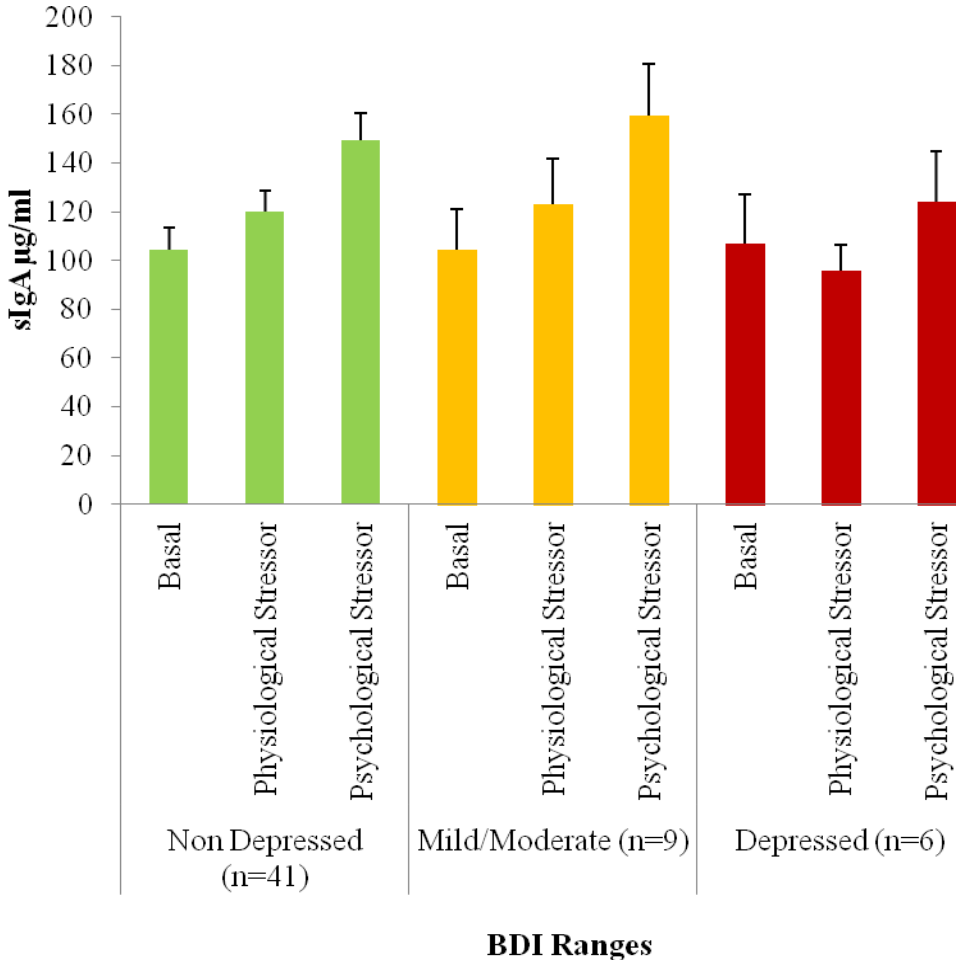

Figure 8.9 Shows BDI and age ranges and sIgA response. Data shown are mean ± SEM.

8.1.9. sIGA RESPONSE & STRESSED DURING THE DAY

Figure 8. 10 illustrate the *sIgA* response i.e. *basal*, after *physiological stressor*, after *psychological stressor* and if subject experienced *stress during the day*. This data was not significant (F(4,55)=0.878, p: NS.

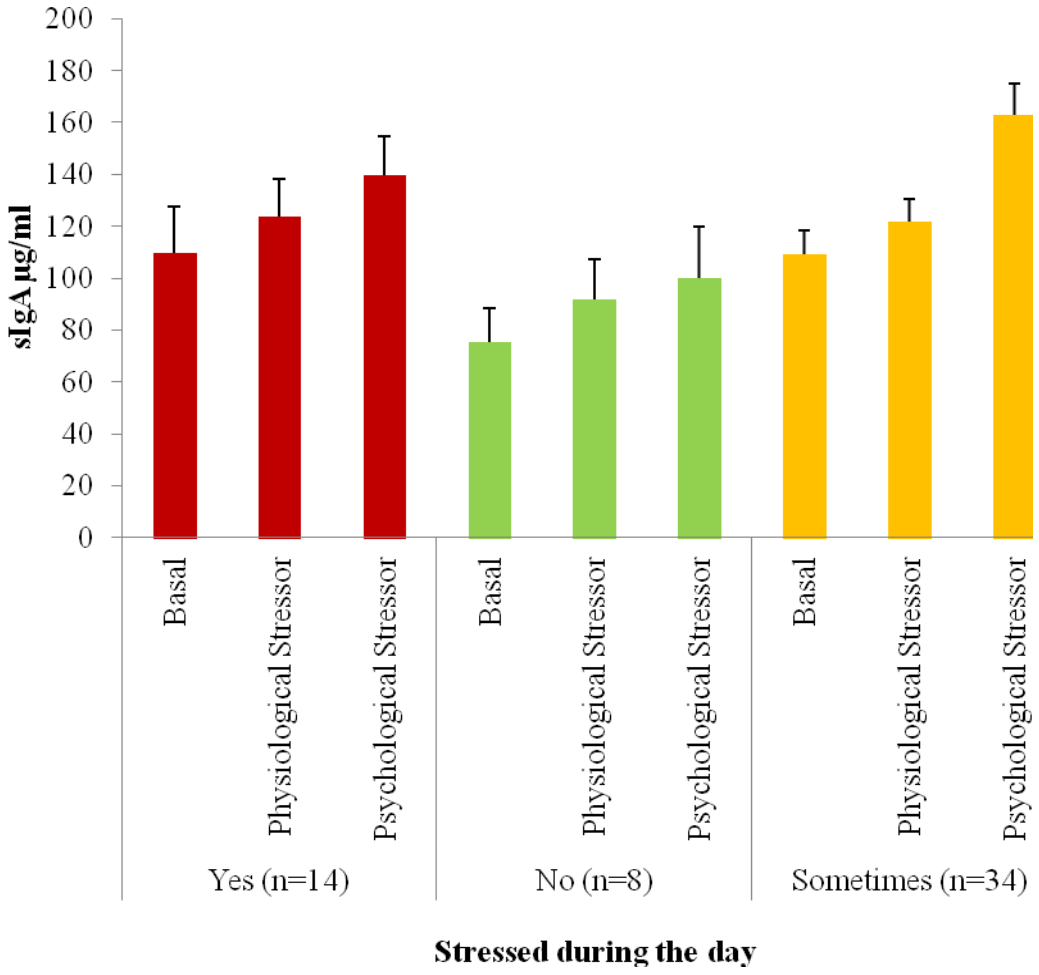

Figure 8.10 Shows sIgA response and if participants experienced stress during their daily routines. Data shown are mean ± SEM.

8.2. Z SCORE FREQUENCIES FOR DAS 59

8.2.1. GENERAL SELF CONSCIOUSNESS OF APPEARANCE (GSC)

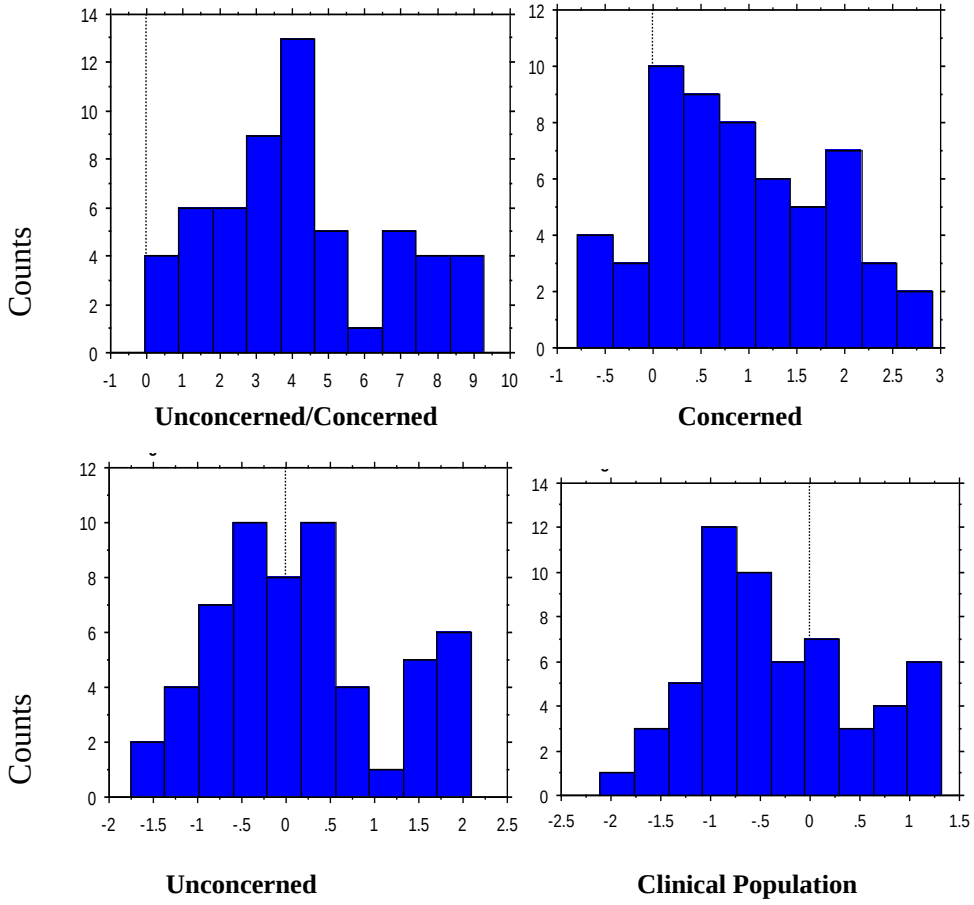

Figure 8.11 The histograms show Z scores for subgroup GSC against accumulated population scores from the DAS 59 manual.

These histograms shown in figure 8.11 show the frequency of Z scores for the Derriford Appearance Scale (DAS 59) subgroup - *General Self-consciousness of Appearance (GSC)*. Each individual participant of Study Two had their Z scores checked against the accumulated population scores by the creators of DAS 59. The population data were broken down in to four groups: *unconcerned/concerned, concerned, unconcerned* and *clinical population*. Study 2 participants' scores were compared against each of the population groups to determine if the participants' values were normally distributed. Normal Z score distributions accept variations of ±2 SD to determine normal fit. For the

GSC subgroup we can determine that Study Two participants for *unconcerned/concerned* had a total of 5 outliers, *concerned* group 0 outliers, *unconcerned* group 41 outliers and *clinical* group 0 outliers. From the results we can objectively state that these data were normally distributed within the *concerned* and *clinical population* data.

8.2.2. SOCIAL SELF CONSCIOUSNESS OF APPEARANCE (SSC)

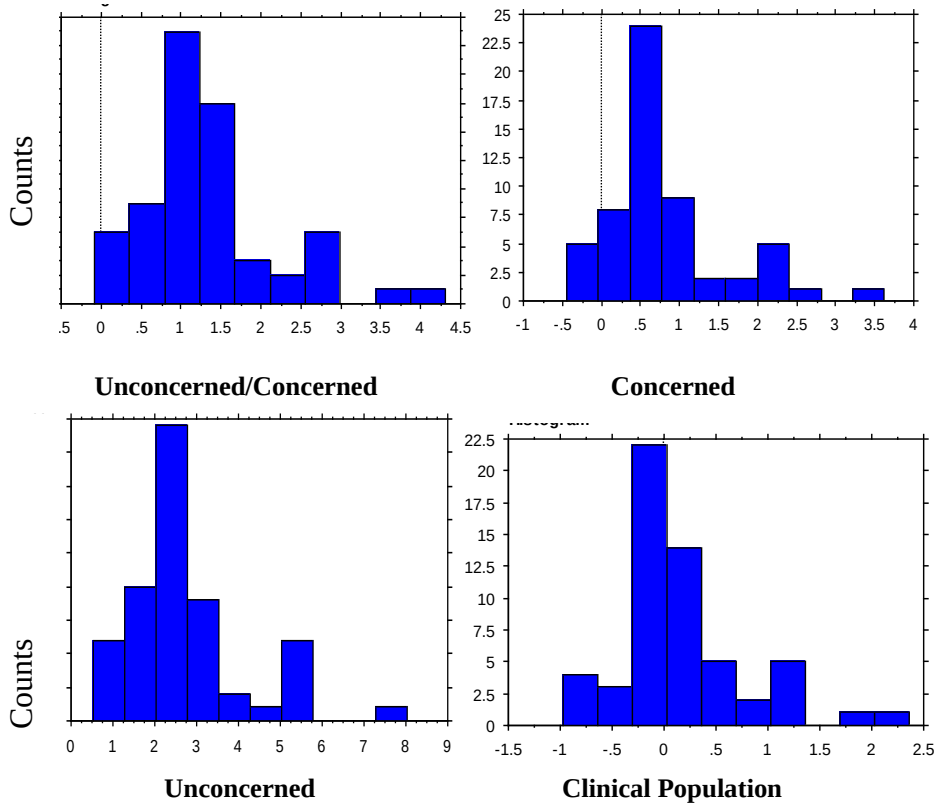

Figure 8.12 The histograms show Z scores for subgroup SSC against accumulated population scores.

These histograms in figure 8.12 show the frequency counts of Z scores for the Derriford Appearance Scale (DAS 59) subgroup - *Social Self-consciousness of Appearance (SSC)*. Each individual participant of Study Two had their Z scores calculated against the accumulated population scores by the creators of DAS 59. The population data were broken down in to four groups: *unconcerned/concerned, concerned, unconcerned* and *clinical population*. Study 2 participants' scores were compared against each of the population groups to determine if the participants' values were normally distributed. Normal Z score distributions accept variations of ± 2 SD to determine normal fit. For the *SSC* subgroup we can determine that Study Two participants for *unconcerned/concerned* had a total of 9 outliers, *concerned* group 2 outliers,

unconcerned group 19 outliers and *clinical* group 1 outliers. From the results we can objectively state that these data were normally distributed within the *concerned* and *clinical* group population data.

8.2.3. SEXUAL AND BODILY SELF- CONSCIOUSNESS OF APPEARANCE (SBSC)

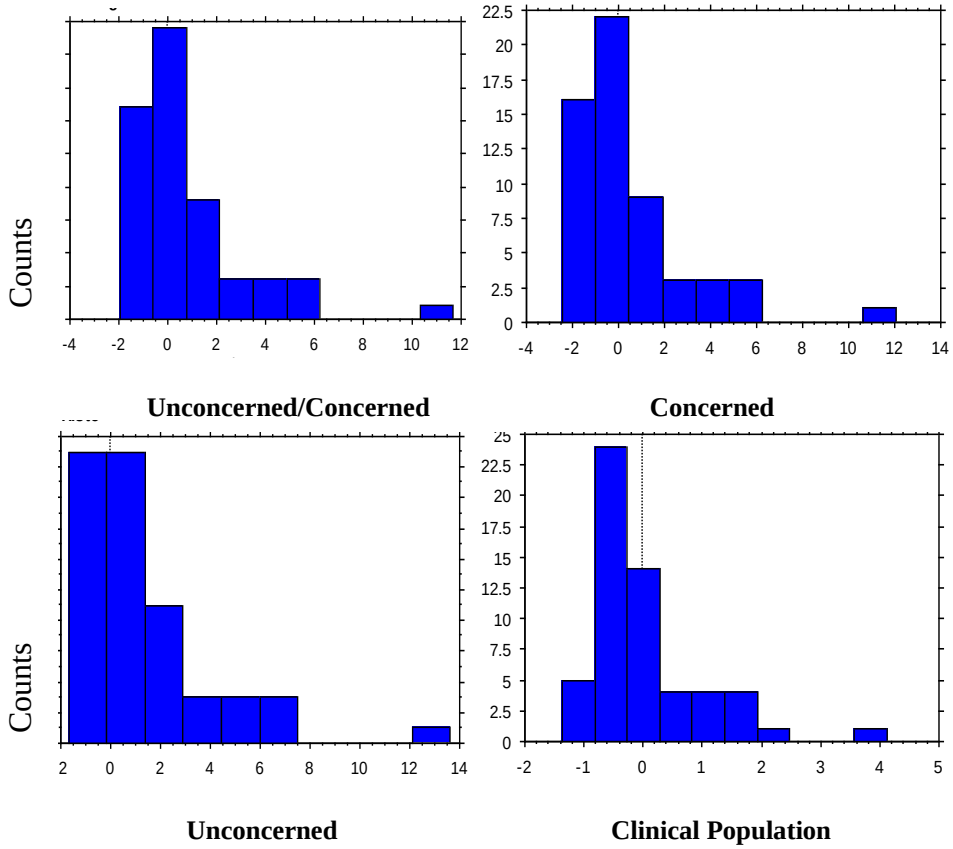

Figure 8.13 The histograms show Z scores for subgroup SBSC against accumulated population scores.

These histograms in figure 8.13 show the number of counts for the Z scores for the Derriford Appearance Scale (DAS 59) subgroup – *Sexual & Bodily Self-Consciousness of Appearance (SBSC).* Each individual participant of Study Two had their Z scores calculated against the accumulated population scores by the creators of DAS 59. The population data were broken down in to four groups: *unconcerned/concerned, concerned, unconcerned* and *clinical population*. Study 2 participants' scores were compared against each of the population groups to determine if the participants' values were normally distributed. Normal Z score distributions accept variations of ± 2 SD to determine normal fit. For the *SBSC* subgroup we can determine that Study Two

participants for *unconcerned/concerned* had a total of 10 outliers, *concerned* group 10 outliers, *unconcerned* group 19 outliers and the *clinical* group 2 outliers. From the results we can objectively state that these data were normally distributed within the *clinical* group population data.

8.2.4. NEGATIVE SELF-CONCEPT (NSC)

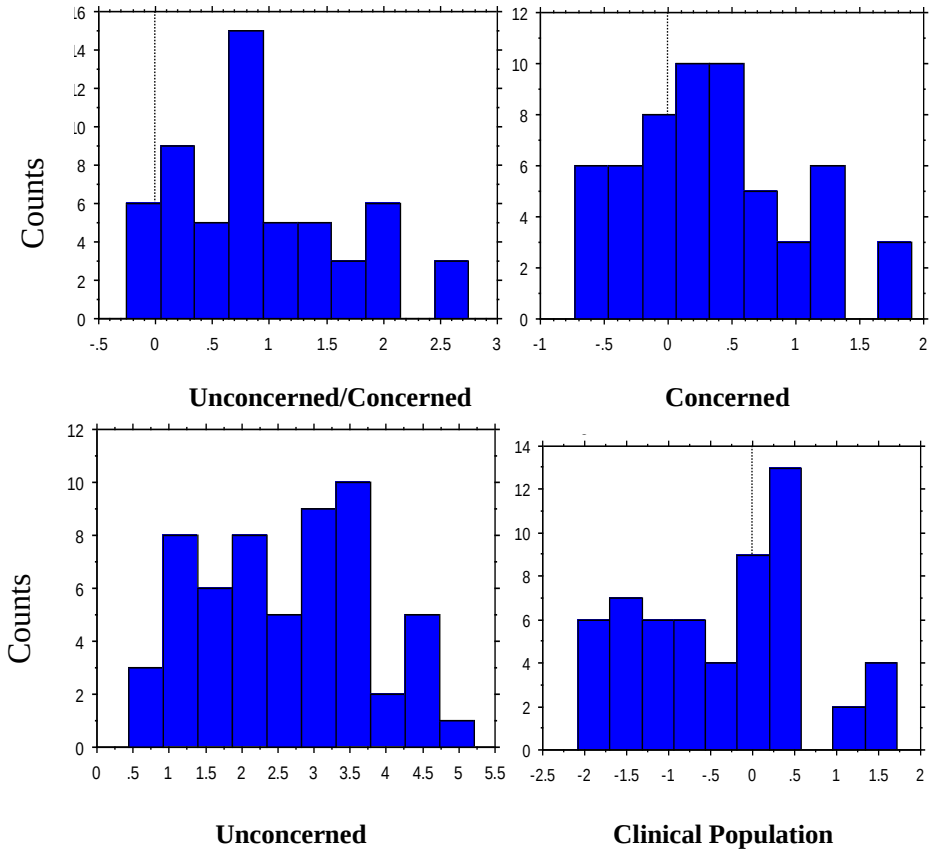

Figure 8.14The histograms show Z scores for subgroup NSC against accumulated population scores.

The graphs in figure 8.14 show the number of counts for the Z scores for the Derriford Appearance Scale (DAS 59) subgroup – *Negative Self-Concept (NSC).* Each individual participant of Study Two had their Z scores calculated against the accumulated population scores by the creators of DAS 59. The population data were broken down in to four groups: *unconcerned/concerned, concerned, unconcerned* and *clinical population*. Study 2 participants' scores were compared against each of the population groups to determine if the participants' values were normally distributed. Normal Z score distributions accept variations of ± 2 SD to determine normal fit. For the *NSC* subgroup we can determine that Study Two participants for *unconcerned/concerned* had a total of 3 outliers, *concerned* group 0 outliers, *unconcerned* group 32 outliers and the

clinical group 0 outliers. From the results we can objectively state that these data were normally distributed within the *concerned* and *clinical* group population data.

8.2.5. FACIAL SELF-CONSCIOUSNESS OF APPEARANCE (FSC)

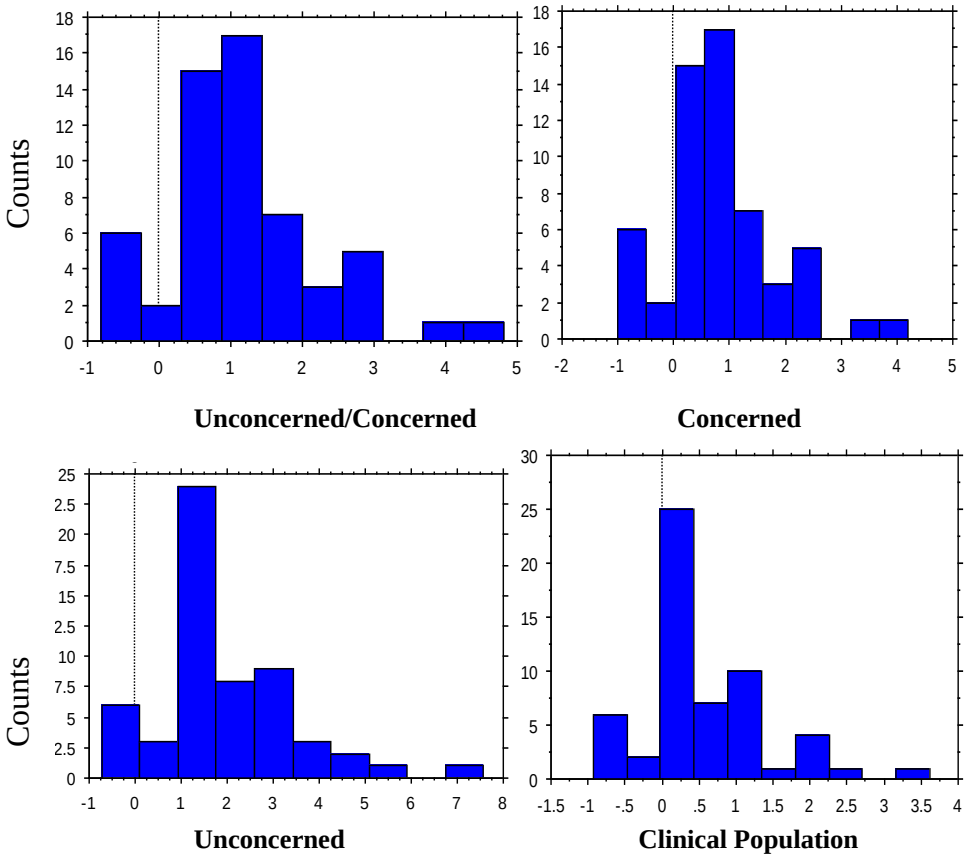

Figure 8.15The histograms show Z scores for subgroup FSC against accumulated population scores.

The graphs in figure 8.15 show the number of counts for the Z scores for the Derriford Appearance Scale (DAS 59) subgroup - *Facial Self-consciousness of Appearance (FSC)*. Each individual participant of Study Two had their Z scores calculated against the accumulated population scores by the creators of DAS 59. The population data were broken down in to four groups: *unconcerned/concerned, concerned, unconcerned* and *clinical* population. Study 2 participants' scores were compared against each of the population groups to determine if the participants' values were normally distributed. Normal Z score distributions accept variations of ± 2 SD to determine normal fit. For the *FSC* subgroup we can determine that Study Two participants for

unconcerned/concerned had a total of 10 outliers, *concerned* group 7 outliers, *unconcerned* group 17 outliers and *clinical* group 6 outliers. From the results we can objectively state that these data were normally distributed within the *concerned* and *clinical* group population data.

8.2.6. DAS 59 FULL SCORE (F-S)

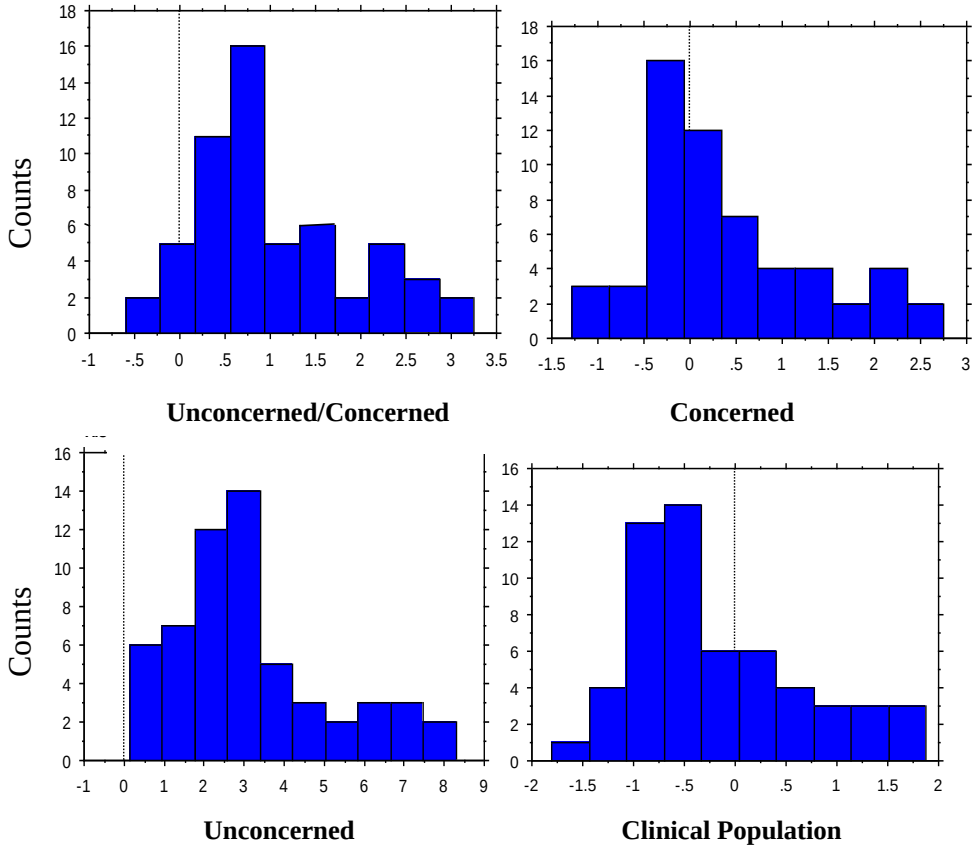

Figure 8.16 The histograms show Z scores for subgroup F-S against accumulated population scores.

The graphs in figure 8.16 show the number of counts for the Z scores for the Derriford Appearance Scale (DAS 59) subgroup – *Full Score (F-S).* Each individual participant of Study Two had their Z scores calculated against the accumulated population scores by the creators of DAS 59. The population data were broken down in to four groups: *unconcerned/concerned, concerned, unconcerned* and *clinical population*. Study 2 participants' scores were compared against each of the population groups to determine if the participants' values were normally distributed. Normal Z score distributions accept variations of ± 2 SD to determine normal fit. For the *F-S* subgroup we can determine that Study Two participants for *unconcerned/concerned* had a total of 10 outliers, *concerned* group 6 outliers, *unconcerned* group 44 outliers and *clinical* group 0

outliers. . From the results and as shown in Table 8.1 we can objectively state that these data were normally distributed within the *clinical* group population data.

Z SCORE FOR DAS 59

	UNCONCERNED/ CONCERNED	CONCERNED	UNCONCERNED	CLINICAL POPULATION
GSC	**0.914**	**0.123**	**4.135**	**-0.347**
SSC	**1.354**	**0.803**	**2.691**	**0.157**
SBSC	**0.740**	**0.353**	**1.259**	**-0.004**
NSC	**0.938**	**0.365**	**2.607**	**-0.381**
FSC	**1.185**	**0.837**	**1.961**	**0.569**
F-S	**1.050**	**0.388**	**3.181**	**-0.191**

Table 8.1Table shows the mean Z score values for Study Two participants.

Z scores were calculated from the norms tables. The Z scores for each subject were then averaged and compared against the DAS 59 Z scores for each variable i.e. *unconcerned/concerned, concerned, unconcerned* and the *clinical population*. As can be seen for *general self-consciousness of appearance (GSC)* the *unconcerned/concerned* and *concerned* group were within the normal distribution. However, the *unconcerned* and *clinical population* fell outside of the normal range. For *social self-consciousness of appearance (SSC)* the *unconcerned/concerned* group and the *concerned* group fell within the normal distribution. However the *unconcerned* and *clinical population* fell outside the normal range. For *sexual and bodily self-consciousness of appearance (SBSC)* all groups fell within the normal distribution range. *Negative self-concept (NSC),* the *unconcerned/concerned, concerned* and *clinical population* fell outside the normal distribution range. However the *unconcerned* group fell outside of the normal

distribution range. For *facial self-consciousness of appearance (FSC)* all Z scores fell within the normal distribution range. *Full Score (F-S)* the *unconcerned/concerned*, *concerned* and *clinical population* all fell within the normal distribution range. However the *unconcerned* group fell outside of the normal distribution range.

8.2.7. DAS 59 GENERAL SELF-CONSCIOUSNESS OF APPEARANCE (GSC), GENDER AND ETHNICITY

Figure 8. 17 show the *GSC* values divided by *gender* and *ethnicity*. As is evident from the means *females* had a higher overall mean value for *GSC* in comparison to the *males*. ANOVA for the data revealed that gender significantly affected *GSC* values with ($F(1,51)=8.833$, $p<0.05$.

Ethnicity also affected *GSC* values. *Caucasian* respondents showed much higher values for *GSC* in comparison to the *Asian/British Asian* group. The *Asian/British Asian* group had the lowest overall *GSC* values. ANOVA for ethnicity and corresponding *GSC* values showed a significant outcome with ($F(2,54)=8.833$, $p<0.05$.

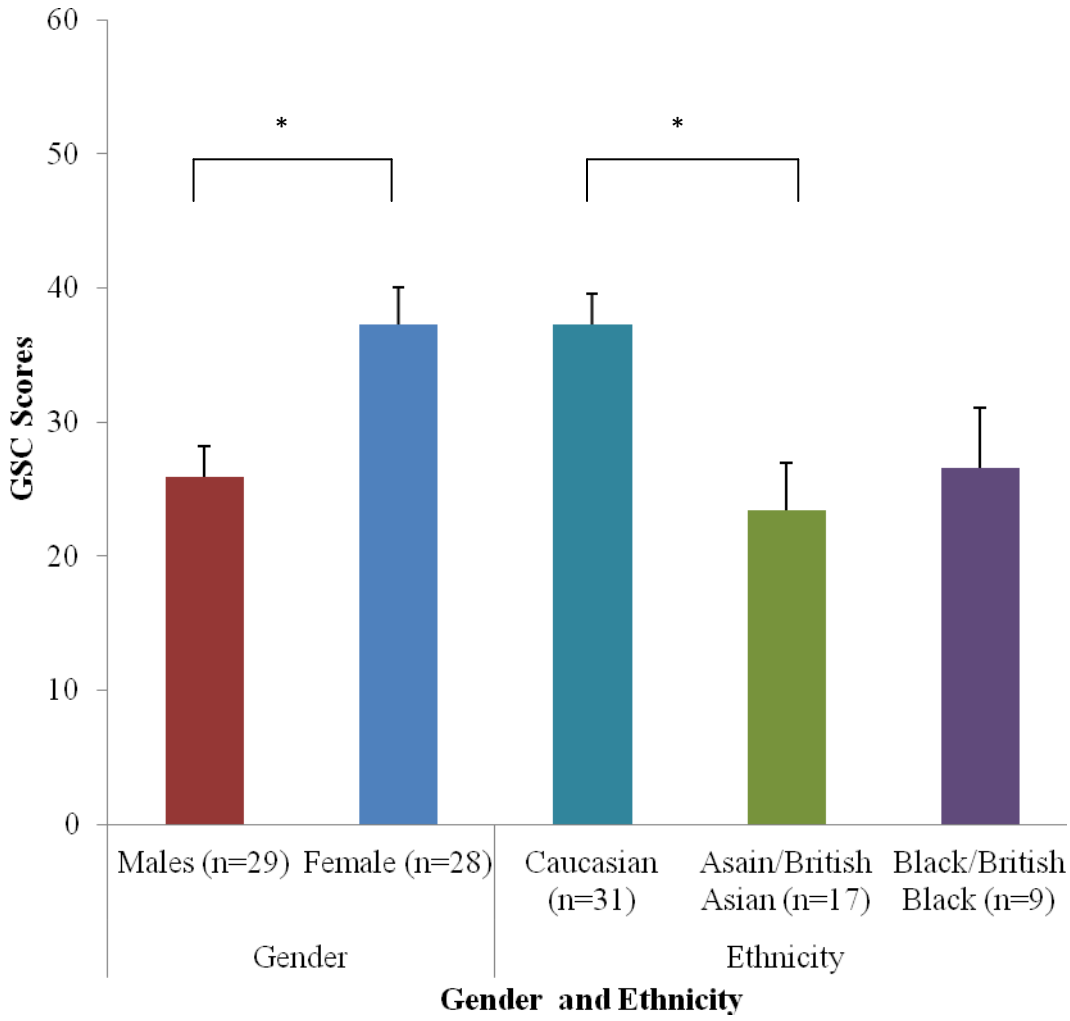

Figure 8.17 The graph depicts values for GSC broken down by gender and ethnicity. Data shown are mean ± SEM. * significantly different, Bonferroni/Dunn, $p<0.05$.

8.2.8. DAS 59 GENERAL SELF-CONSCIOUSNESS OF APPEARANCE (GSC) AGAINST BODY IMAGE QUESTIONS

There were 6 body image questions that asked about body image concerns, including: do they have appearance concerns; are they preoccupied by these concerns; do they have concerns over slimness; do they cause distress; do they have concerns when in social setting; do you avoid social settings. Respondents only gave '*Yes*' or '*No*' answers.

Figure 8.18. illustrates *GSC* values for all subjects in response to the body image questions. ANOVA revealed that those with *appearance concerns* had higher mean values for *GSC* with ($F(1,53)=45.789$, $p<0.0001$. ANOVA revealed that those with *preoccupation & concerns* had higher values for *GSC* with ($F(1,53)=18.671$, $p<0.0001$. ANOVA revealed that those with *concerns & distress* had higher *GSC* values with ($F(1,53)=25.743$, $p<0.0001$. ANOVA revealed that those with *concerns over slimness* had higher *GSC* values with ($F(1,53)=18.421$, $p<0.0001$. ANOVA revealed that those with *social setting concerns* had higher *GSC* values with ($F(1,53)=15.057$, $p<0.05$. ANOVA revealed that those with *avoidance concerns* had higher *GSC* values with ($F(1,53)=38.909$, $p<0.0001$

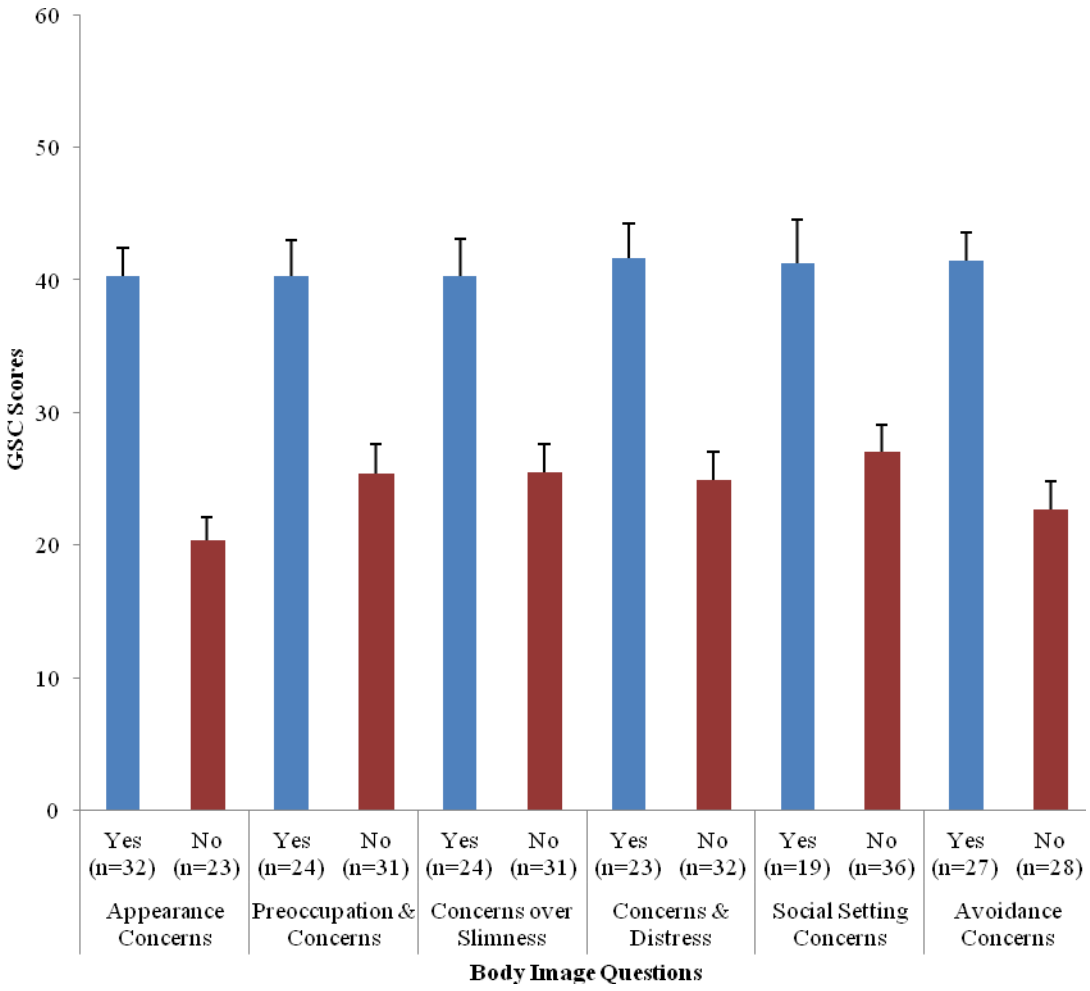

Figure 8.18 The graph depicts the values for GSC and Body Image questions. Data shown are means ± SEM. See text for statistical breakdown of results.

8.2.9. DAS 59 GENERAL SELF-CONSCIOUSNESS OF APPEARANCE (GSC) & TIME SPENT CONCERNED ON APPEARANCE

Figure 8. 19 show *GSC* values for the categories of *time spent concerned*. As is evident respondents who said that they spent *< 1 hour/day* with concerns showed the lowest values for *GSC*. ANOVA on these data revealed that there was an overall significant effect for *time spent concerned* and mean values for *GCS* with ($F(2,52)=14.131$, $p<0.0001$.

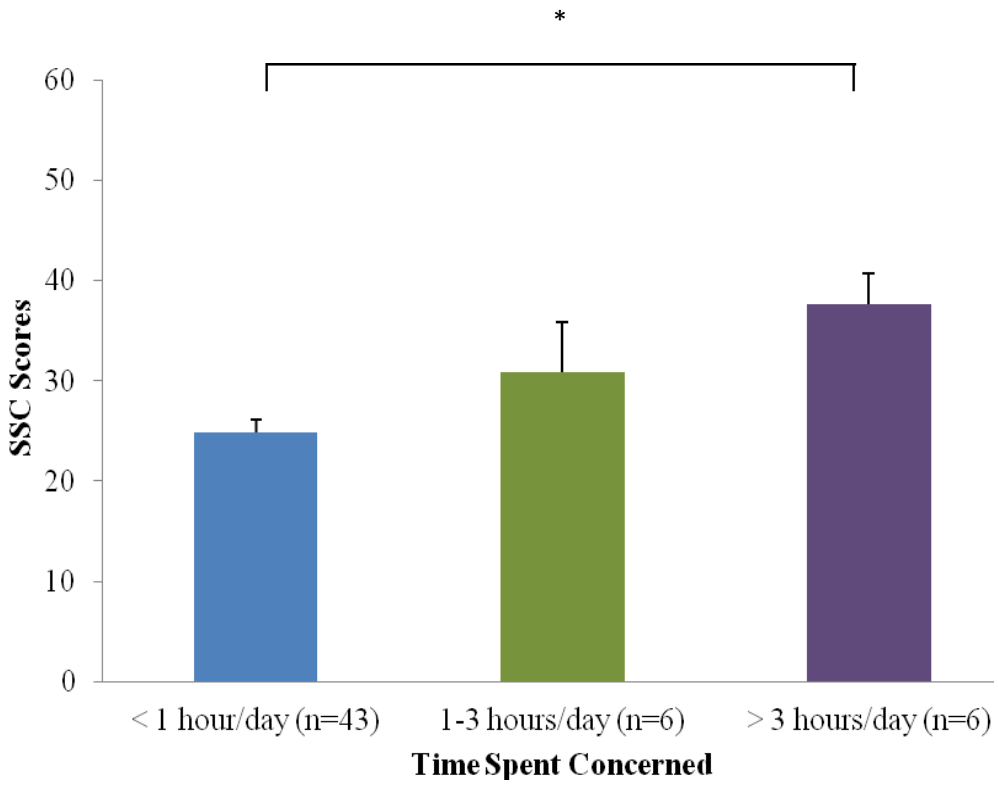

Figure 8.19 The graph depicts GSC values and time spent concerned with regards to appearance. Data shown are mean ± SEM. * significantly different, Bonferroni/Dunn, p<0.05.

8.2.10. DAS 59 SOCIAL SELF-CONSCIOUSNESS OF APPEARANCE (SSC) & AGE

Figure 8. 20 show the values for *SSC* for the various age categories. As is evident respondents in the *middle age category* showed the highest mean values for *SSC*. ANOVA on these data revealed that there was a significant change in *SSC* across the different age categories with ($F(2,54)=3.953$, $p<0.05$.

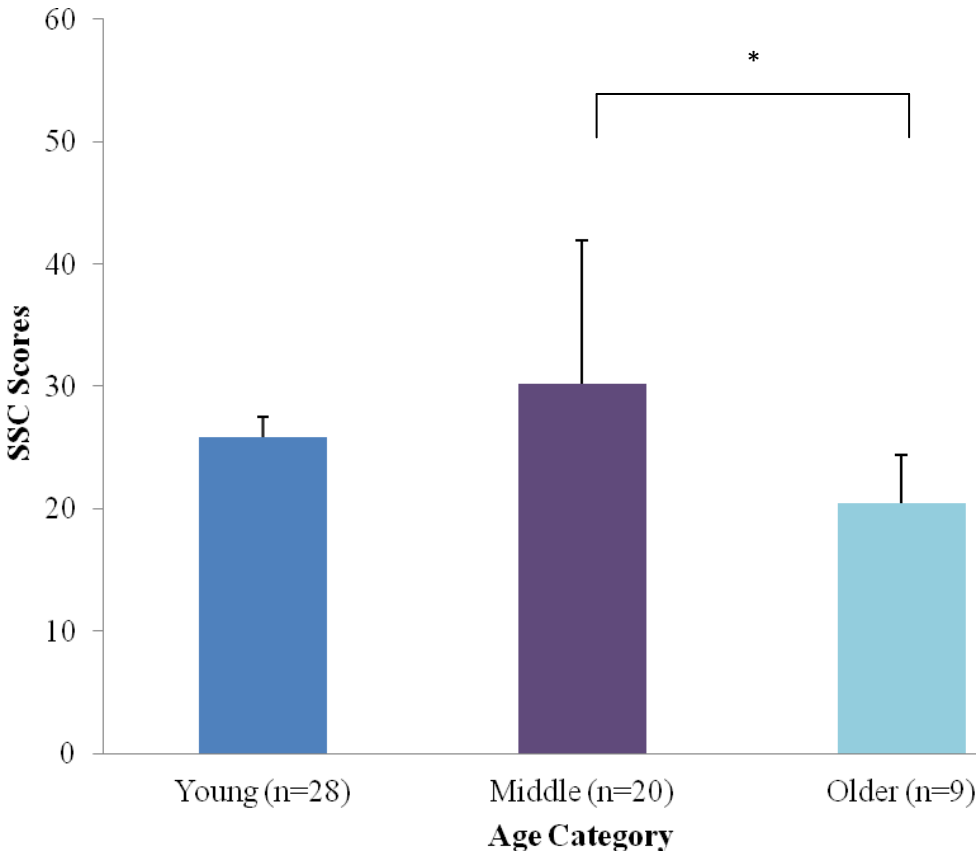

Figure 8.20 The graph depicts SSC values according to age categories. Data shown are mean ± SEM. * significantly different, Bonferroni/Dunn, p<0.05.

8.2.11. DAS 59 SOCIAL SELF-CONSCIOUSNESS OF APPEARANCE (SSC) AGAINST BODY IMAGE QUESTIONS

There were 5 body image questions which were significant that asked about body image concerns, including: do they have appearance concerns; do you have concerns over slimness; do they cause distress; do you have concerns when in social setting; do you avoid social settings. Respondents only gave '*Yes*' or '*No*' answers.

Figure 8. 21 show the *SSC* values for all subjects in response to the body image questions. ANOVA revealed that those with *appearance concerns* had higher *SSC* values with ($F(1,53)=7.714$, $p<0.05$. ANOVA revealed that those with *concerns over slimness* had higher *SSC* values with ($F(1,53)=6.680$, $p<0.05$. ANOVA revealed that those with *concerns & distress* had higher values for *SSC* with ($F(1,53)=8.245$, $p<0.05$. ANOVA revealed that those with *social setting concerns* had higher *SSC* values ($F(1,53)=5.952$, $p<0.05$. ANOVA revealed that those with *avoidance concerns* had higher *SSC* values with ($F(1,53)=4.240$, $p<0.05$.

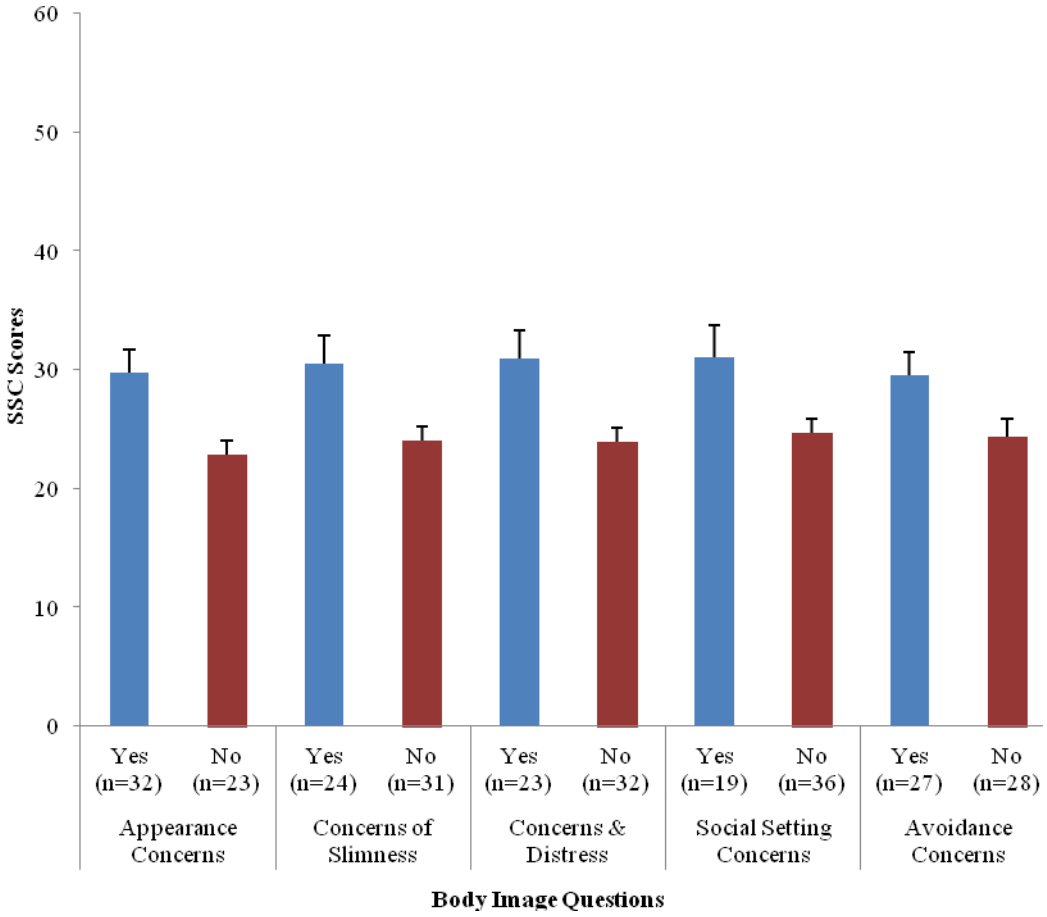

Figure 8.21The graph depicts the values for SSC and Body Image questions. Data shown are means ± SEM. See text for statistical breakdown of the results.

8.2.12. DAS 59 SOCIAL SELF-CONSCIOUSNESS OF APPEARANCE (SSC) & TIME SPENT CONCERNED ABOUT APPEARANCE

Figure 8. 22 shows the values for *SSC* across the various categories for *time spent concerned* about appearance. As is illustrated in the graph respondents who stated that they spent *< 1 hour/day concerned* about their appearance were seen to have the lowest mean values for *SSC*. The highest values for *SSC* were seen in respondents who stated that they spend *> 3 hours/day*. ANOVA for the data revealed for *SSC* values varied significantly across these time categories with ($F(2,52)=6.429$, $p<0.05$.

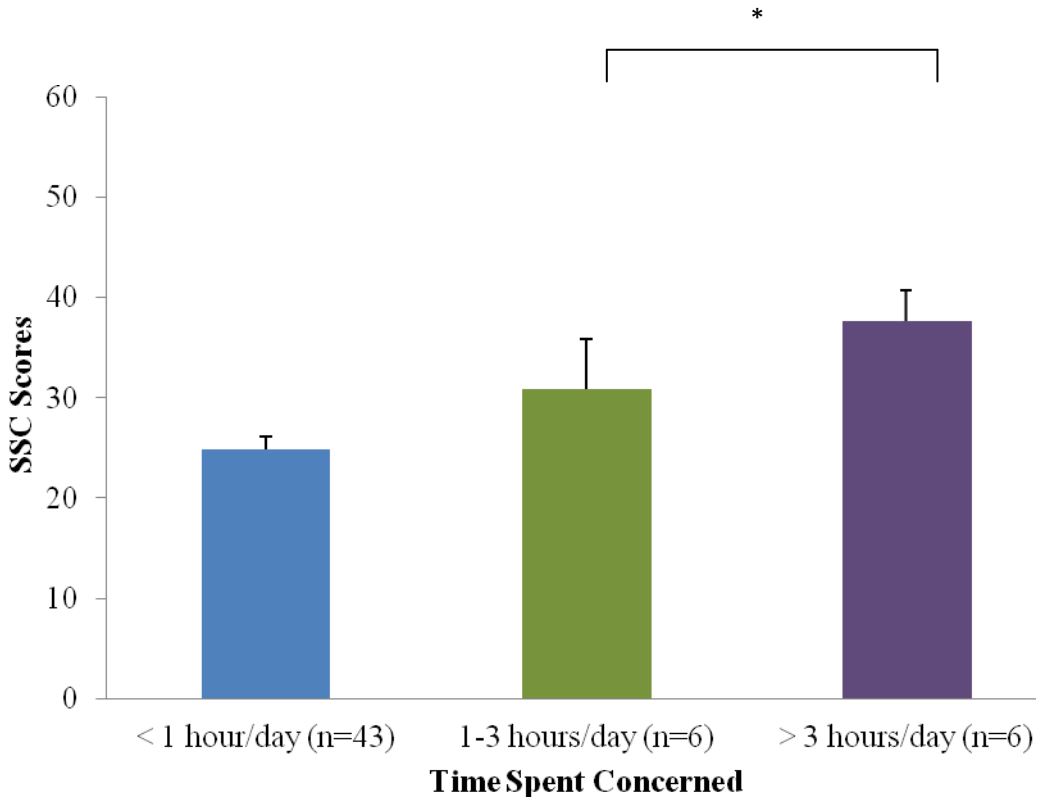

Figure 8.22 The graph depicts SSC values and time spent concerned with regards to appearance. Data shown are mean ± SEM. * significantly different, Bonferroni/Dunn, p<0.05.

8.2.13. DAS 59 SEXUAL & BODILY SELF-CONSCIOUSNESS OF APPEARANCE (SBSC)

Figure 8. 23 show the values for *SBSC* in *females* and *males*. As is evident *females* showed higher values for *SBSC* than compared to *male* subjects.ANOVA for these data revealed that *SBSC* values varied with gender a with ($F(1,55)=9.017$, $p<0.05$.

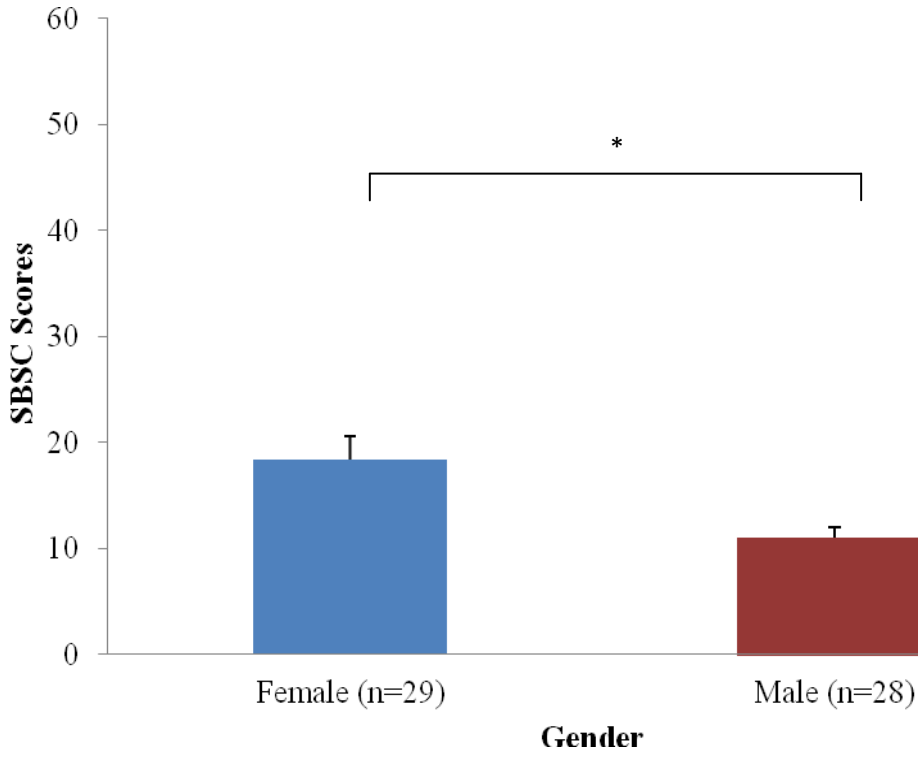

Figure 8.23 The graph depicts values for SBSC and gender. Data shown are means ± SEM. *Significantly different, Bonferroni/Dunn p<0.05.

8.2.14. DAS 59 SEXUAL AND BODILY SELF-CONSCIOUSNESS OF APPEARANCE (SBSC) AGAINST BODY IMAGE QUESTIONS

There were 6 body image questions that asked about body image concerns, including: do they have appearance concerns; are they preoccupied by these concerns; do you have concerns over slimness; do they cause distress; do you have concerns when in social setting; do you avoid social settings. Respondents only gave '*Yes*' or '*No*' answers.

Figure 8. 24 show *SBSC* values for all subjects in response to the body image questions. ANOVA revealed that those with *appearance concerns* had higher *SBSC* values with ($F(1,53)=8.989$, $p<0.05$. ANOVA revealed that those with *preoccupation & concerns* had higher *SBSC* values with ($F(1,53)=9.841$, $p<0.05$. ANOVA revealed that those with *concerns over slimness* had higher *SBSC* values ($F(1,53)=7.817$, $p<0.05$. ANOVA revealed that those with *concerns & distres*s had higher *SBSC* values with ($F(1,53)=9.736$, $p<0.05$. ANOVA revealed that those with *social setting concerns* had higher *SBSC* values with ($F(1,53)=13.495$, $p<0.05$. ANOVA revealed that those with *avoidance concerns* had higher *SBSC* values with ($F(1,53)=13.495$, $p<0.05$.

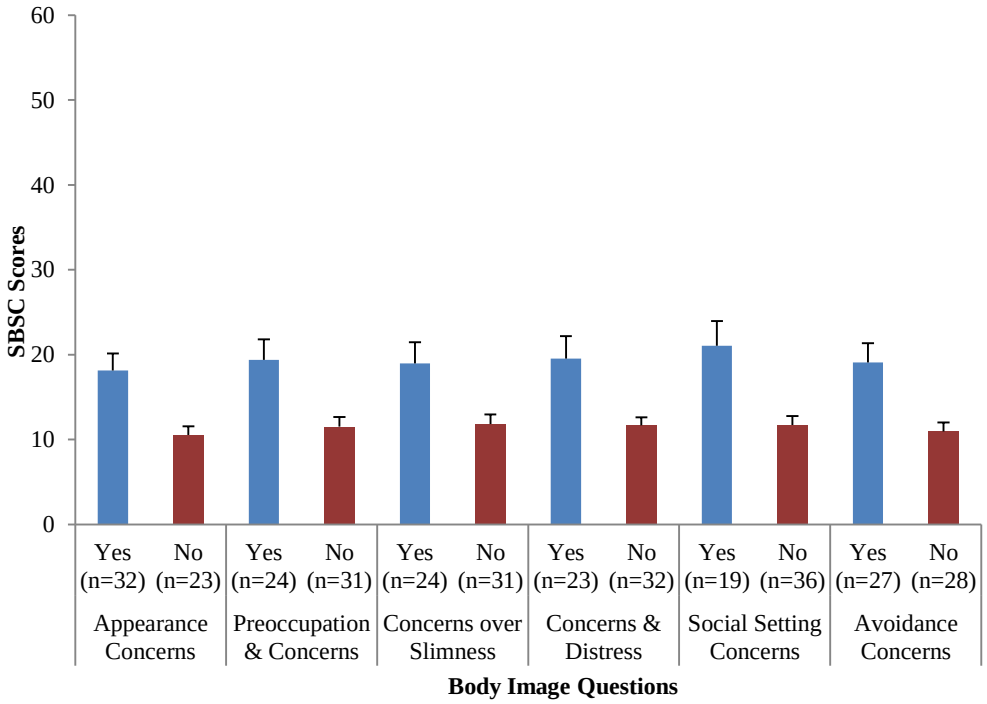

Figure 8.24 The graph depicts the values for SBSC and Body Image questions Data shown are means ± SEM. See text for statistical breakdown of the results.

8.2.15. DAS 59 SEXUAL AND BODILY SELF-CONSCIOUSNESS OF APPEARANCE (SBSC) & TIME SPENT CONCERNED ABOUT APPEARANCE

Figure 8. 25 shows the values for *SBSC* and *time spent concerned* combined for all subjects. Respondents who rated that they spent *<1 hour/day* concerned about their appearance showed the lowest mean values for *SBSC*. The respondents who spent *>3 hours/day* showed the highest mean values for *SBSC*. The ANOVA on the data that revealed *SBSC* values varied with *time spent concerned* with ($F(2,52)=25.089$, $p<0.0001$.

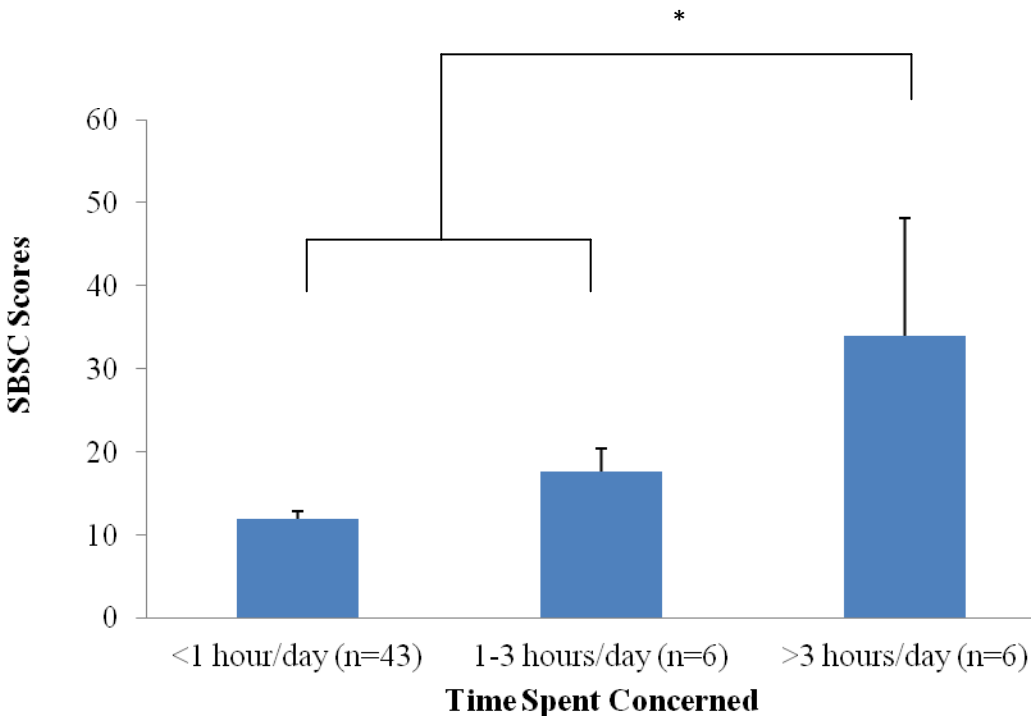

Figure 8.25 This graph depicts SBSC values and time spent concerned with regards to appearance. Data shown are mean ± SEM. * significantly different from other groups, Bonferroni/Dunn, p<0.05.

8.2.16. DAS 59 NEGATIVE SELF CONCEPT (NSC) & ETHNICITY

Figure 8. 26 shows the values for *NSC* and *ethnicity* combined for *females* and *males*. As is evident from the graph the *Caucasian* group show the highest mean values for *NSC*. Both the *Asian/British Asian* and the *Black/British Black* group showed similar responses for *NSC*. ANOVA on these data revealed that *NSC* values varied with ethnicity with ($F(2,54)=7.994$, $p<0.05$.

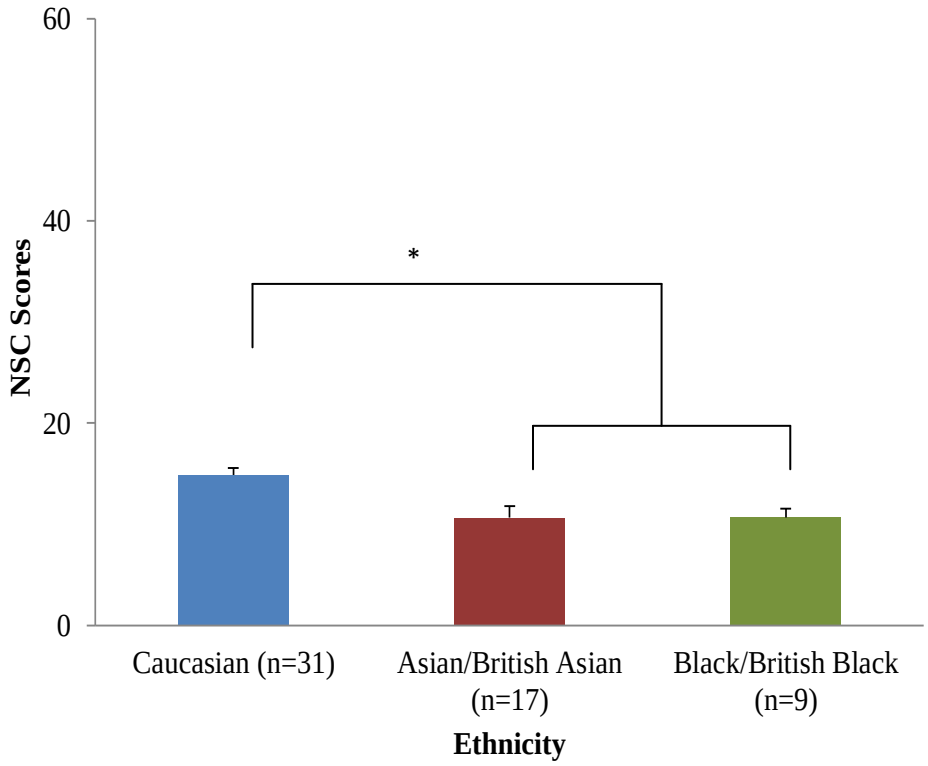

Figure 8.26 The graph depicts values for NSC across different ethnic groups. Data shown ± SEM. *significantly different from the other 2 ethnic groups. Bonferroni/Dunn, $p<0.05$.

8.2.17. DAS 59 NEGATIVE SELF CONCEPT (NSC) & BODY IMAGE QUESTIONS

There were 5 body image questions that were significant and focused on body image concerns, including: do they have appearance concerns; are they preoccupied by these concerns; do you have concerns over slimness; do you have concerns when in social setting; do you avoid social settings. Respondents only gave '*Yes*' or '*No*' answers.

Figure 8. 27 show the *NSC* values for all subjects in response to the body image questions. ANOVA for the data revealed that those with *appearance concerns* had higher *NSC* values with ($F(1,53)=29.66$, $p<0.0001$. ANOVA for the data revealed that those with *preoccupation & concerns* had higher *NSC* values with ($F(1,53)=14.338$, $p<0.05$. ANOVA for the data revealed that those with *concerns over slimness* had higher *NSC* values with ($F(1,53)=14.338$, $p<0.05$. ANOVA for the data revealed that those with *social setting concerns* had higher *NSC* values with ($F(1,53)=10.773$, $p<0.05$. ANOVA for the data revealed that those with *avoidance concerns* had higher *NSC* values with ($F(1,53)=12.846$, $p<0.05$.

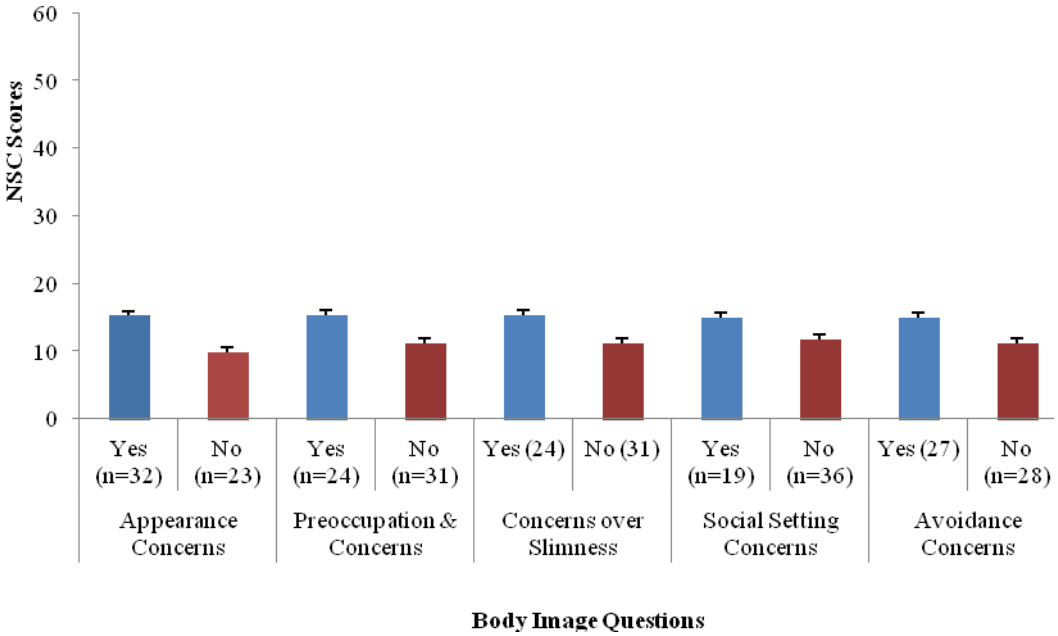

Figure 8.27 The graph depicts the values for NSC and how these responses varied with response to Body Image questions. Data shown are means ± SEM. See text for a statistical breakdown of the results.

8.2.18. DAS 59 PHYSICAL DISTRESS AND DYSFUNCTION & GENDER

Figure 8. 28 show the values for *physical distress & dysfunction* for *females* and *males*. As is evident *females* showed higher values for *physical distress & dysfunction* compared to the *males*. ANOVA on these data revealed a significant effect for gender with ($F(1,55)=8.968$, $p<0.05$.

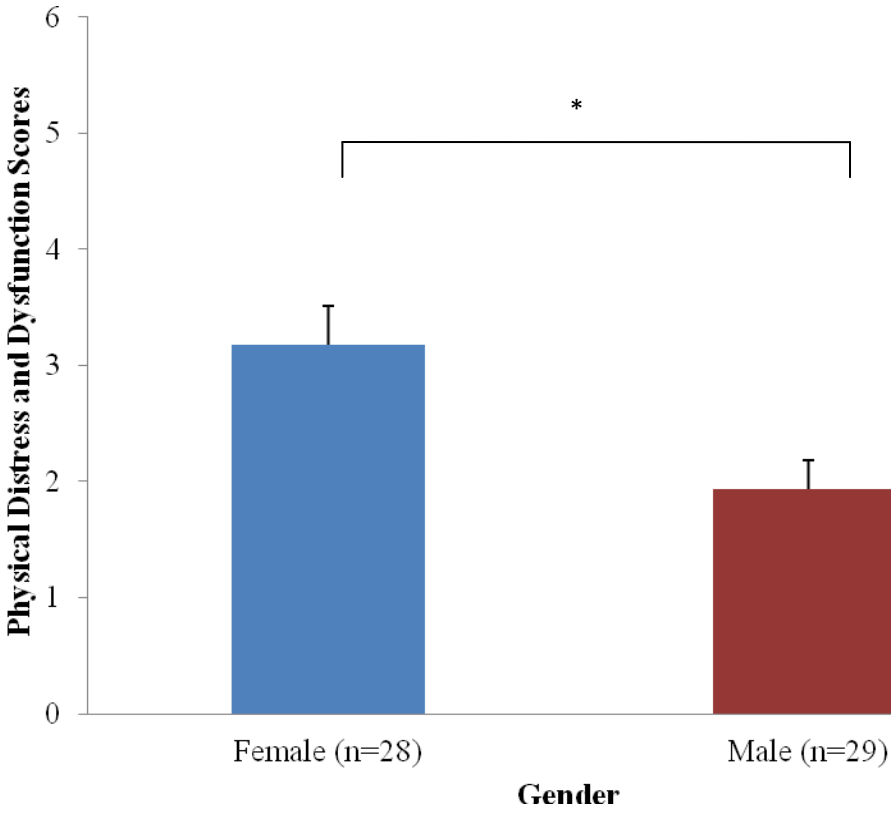

Figure 8.28 The graph depicts both females and males and their responses to Physical Distress and Dysfunction. Data shown are means ± SEM. *significantly different, Bonferroni/Dunn, p<0.05.

8.2.19. DAS 59 PHYSICAL DISTRESS AND DYSFUNCTION & BODY IMAGE QUESTIONS

There were 6 body image questions that asked about body image concerns, including: do they have appearance concerns; are they preoccupied by these concerns; do you have concerns over slimness; do they cause distress; do you have concerns when in social setting; do you avoid social settings. Respondents only gave '*Yes*' or '*No*' answers.

Figure 8. 29 show the values for *physical distress and dysfunction* for all subjects in response to the body image questions. ANOVA for the data revealed that those with *physical distress & dysfunction* had higher *appearance concerns* with ($F(1,53)=14.939$, $p<0.05$. ANOVA for the data revealed that those with *physical distress & dysfunction* had higher *preoccupation & concern* with ($F(1,53)=13.149$, $p<0.05$. ANOVA for the data revealed that those with *physical distress & dysfunction* had higher *concerns over slimness* with ($F(1,53)=6.603$, $p<0.05$. ANOVA for the data revealed that those with *physical distress & dysfunction* had higher *concerns & distress* ($F(1,53)=14.440$, $p<0.05$. ANOVA for the data revealed that those with *physical distress & dysfunction* had higher *social setting concern* with ($F(1,53)=11.492$, $p<0.05$. ANOVA for the data revealed that those with *physical distress & dysfunction* had higher *avoidance concerns* with ($F(1,53)=16.672$ $p<0.05$.

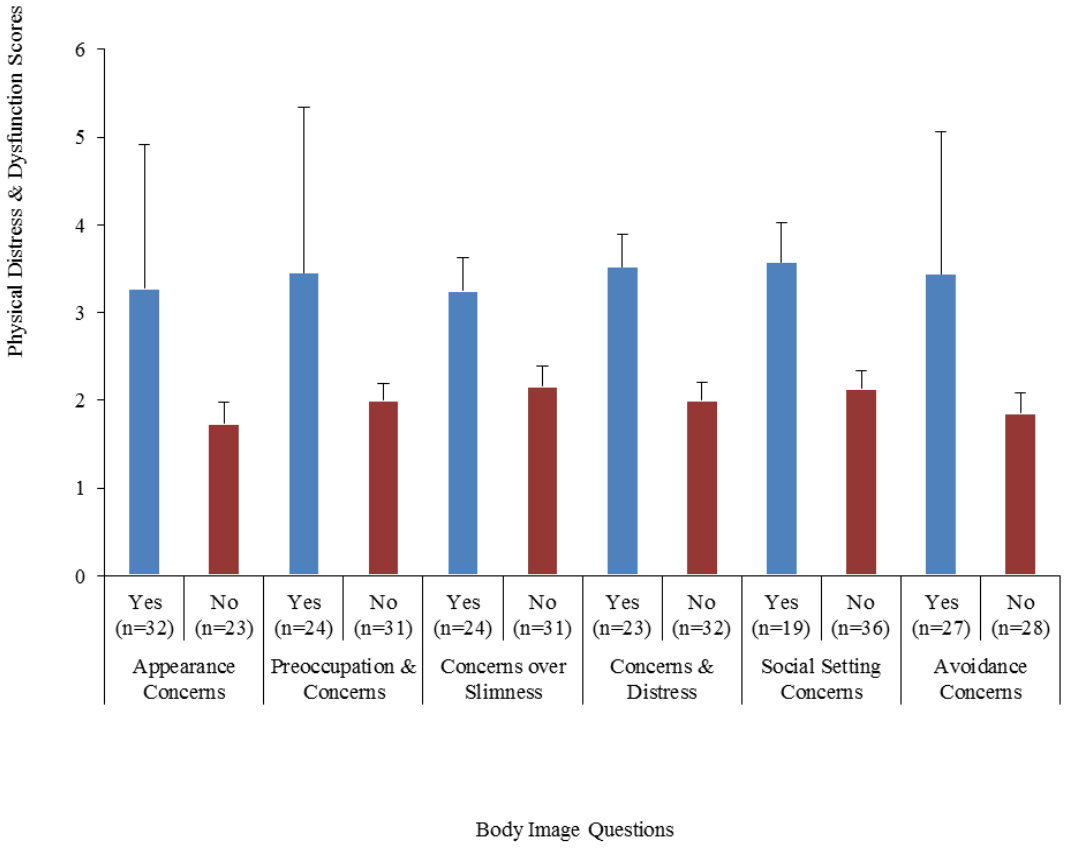

Figure 8.29 The graph depicts the values for Physical Distress & Dysfunction and Body Image questions. Data shown are means ± SEM. See text for statistical breakdown of the results.

8.2.20. DAS 59 PHYSICAL DISTRESS AND DYSFUNCTION AND PREOCCUPATION & TIME SPENT CONCERNED

Figure 8. 30 shows the values for *physical distress & dysfunction* as affected by *time spent concerned* about appearance. ANOVA for the data revealed that there was an overall significant effect with ($F(2,52)=25.930$, $p<0.0001$. As is evident from the graph respondents stated that they *< 1 hour* concerned about their appearances showed the lowest values for *physical distress & dysfunction*. The highest were seen in those subjects who *>3 hours/day* for *physical distress & dysfunction*.

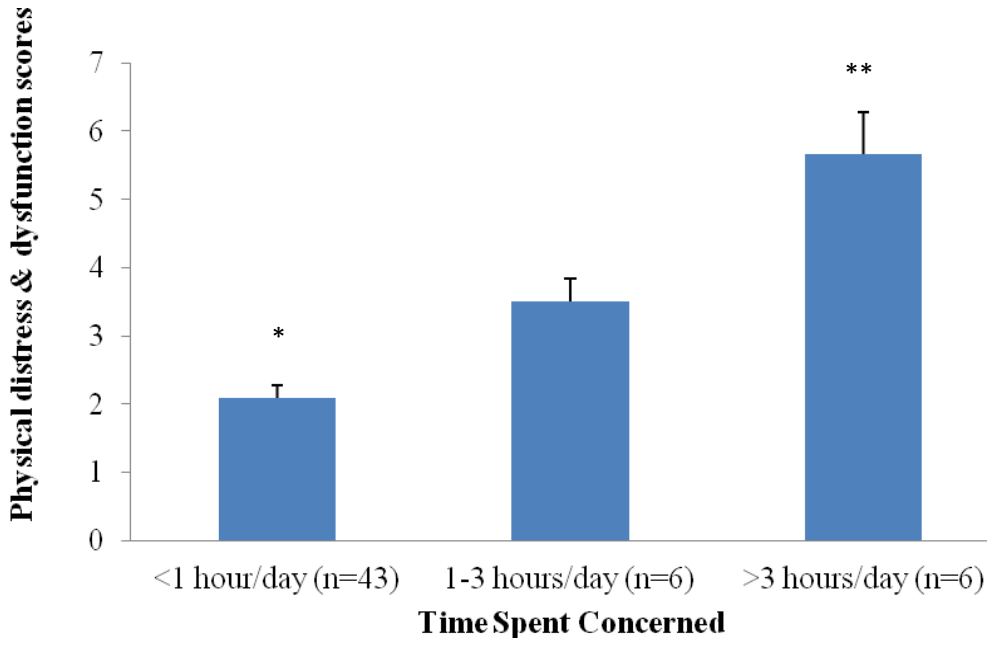

Figure 8.30 The graph depicts Physical Distress & Dysfunction values as affected by time spent concerned with appearance. Data shown are mean ± SEM. * significantly different from the other 2 groups, Bonferroni/Dunn, p<0.05. **significantly different from other 2 groups, Bonferroni/Dunn, p<0.05.

8.2.21. DAS F-S

Males and *females* showed mean values in the 90 point range. Overall *Caucasians* had the highest mean values at 102. *Asian/British Asian* showed a mean of 81 and *Black/British Black* showed the lowest values with a mean of 63. This was significant ($F(2,54)=6.090$, $p<0.0041$.

Please refer to Appendix VII for all non-significant Study Two data.

CHAPTER NINE

9.1. DISCUSSION – STUDY TWO

There was a significant effect for *gender* on *Beck's Depression Inventory* (BDI) scores. Females scored higher than males on the *BDI*. This supports current data showing that women are nearly twice as likely to experience depression. (Angst et al, 2007; Murakumi, 2002). We found that people who stated that they had a previous *history of mental illness* in the past showed significantly higher scores on the *BDI* in comparison to people who answered that they had *no history of mental illness*. In people who have had a *history of mental illness*, the higher *BDI* scores within these subjects could be due to the respondent's nature, and their susceptibility to contributing external factors and daily stressors (Randall, 2004; Selye, 1978). We found that people who were *stressed during the day* had higher *BDI* scores compared to people who were not *stressed during the day*. It is known that chronic daily stressors can lead to forms of mental illness such as depression and anxiety disorders. This could explain why subjects who do get stressed during the day rated higher on the BDI (Selye, 1978; Randall, 2004; Caspi *et al*, 2003).

It appears that people who were *concerned over slimness* also had higher *BDI* scores. This could be due to a number of factors, and if subjects are experiencing stress centred on thin ideals from external factors or internal critiquing this may result in the development of psycho-related pathologies. Thin ideals have been shown to be significantly revered within our society and are coveted (Hesse-Biber, 2005; Nichter & Nichter, 1991). These influences within our society and culture may affect feelings, and could lead to persistent dissatisfaction and depressed moods. As the BDI is a valid indicator of the level of depression they are feeling on that particular day, this indicates

that thin ideals seem to cause significant distress (Stice *et al*, 1994). Furthermore, subjects who were *preoccupied* with thinking about their appearance also showed higher *BDI* results in comparison to those who were not pre-occupied. This suggests that the level of preoccupation with regards to appearance is making them feel more depressed than people who are not pre-occupied with appearance. This again emphasizes that a large proportion of subjects are unhappy and dissatisfied with their appearance which could be a contributing to forming depressive symptoms associated with stress and body image disturbance (Stice *et al*, 1994).

Although the data was not significant for *cortisol* both *physiological* and *psychological* stress altered *cortisol* and *sIgA* responses in our subjects. Beginning with cortisol, this could be due to the fact that stress for prolonged periods can cause disruption to the HPA axis as tissues become accustomed to the increasing levels of cortisol and adrenaline (Selye, 1978). It has been shown that sIgA is sensitive to stressors (Evans *et al*, 1995). In particular acute stressors have been shown to elevate sIgA (Evans *et al*, 1997). The psychological stressor which was the body image interview seemed to increase *sIgA* responses significantly compared to basal levels. Although the *physiological* stressor did show a significant elevation as well this was not as high as for the *psychological* effect. This coincides with other research studies on sIgA in gamers, people who perform presentations, air traffic controllers and football coaches (Kugler *et al*, 1996, Zeier *et al*, 1996; Carroll *et al*, 1996). Research has shown that the relationships between cortisol and sIgA are closely interlinked. The immune system plays a role in the HPA axis system to increase the end product cortisol. (Marketon & Glaser, 2008). Cortisol inhibits the immune system and this is seen in chronic stress (Sapolsky, 1992).

9.2. DERRIFORD APPEARANCE SCALE (DAS 59)

The DAS 59 was used as a level of comparison to assess if individuals interpreted their body image concerns as either a minor concern or as a disfigurement. The body image questionnaire used in Study One revealed a varied mix of body image concern amongst staff and students. The body image questions were used in an interview style format for Study Two. Respondents were given the option of *Yes* and *No* responses to the various questions. Please refer to the norm tables' page 176 for the DAS 59 means from the general population and clinical populations.

9.2.1. OVERVIEW OF DAS 59

General Self-Consciousness of appearance (GSC) and *gender* effects indicated that *females* showed higher responses i.e. had more concern about appearance. *Females* were compared against the *clinical population* means and this revealed that our *females* scored closed to the published *clinical population* values. For *males* and the overall mean values for *GSC* it was consistent with the same norm values for the *general population* all respondents *not concerned* group.

No specific norm mean values for *ethnicity* are given within the DAS 59 manual and mean tables. This study identified a high mean value for the *Caucasian* group in comparison to both the *Asian/British Asian* group and the *Black/British Black* respondents and *GSC.*

GSC values were delineated for each body image question. *'Yes'* to each body image question showed similar means to the *clinical population* values previously

determined from the DAS 59. This suggests that these respondents perceive their body image 'feature' as how the clinical respondents view their features for the *GSC*. Respondents who said *'No'* show similar mean values to those of the *general population* not concerned with appearance for their *GSC* values.

When we compared *GSC* values relative to the amount of *time spent concerned* with appearance we found that respondents who spent *<1 hour/day* showed mean values for *GSC* similar to those of the general population.

Respondents who spend *1-3 hours per day* with appearance concerns showed similar mean values to those of the *clinical population*. Respondents who stated that they *spent >3 hours/day* concerned with their appearance surpassed the *clinical population* altogether. Suggesting that subjects who are obsessive about their appearance show higher distress than the *clinical population*.

Social *Self-consciousness of appearance (SSC)* values varied with the age of respondents and show similar values to those seen in the *clinical population* rather than the *general population* for overall *SSC* values. The scores for the *SSC* in the *young* category were consistent with the *clinical population* for *SSC* values. The *SSC* values in the *older* category were consistent with the *general population SSC* values.

Respondents who gave positive answers to the various body image questions generally had *SSC* values that mirrored those of the *clinical population SSC* values. Those respondents who answered in the negative to the body image questions had lower *SSC* values that were the affirmation responders, but still resembled the *clinical population*. This suggests that these subjects are more distressed than actual disfigured patient regarding their *social self-consciousness of appearance*.

Male subject scores for the *SBSC* scale fell within those of the *general population not concerned* group for *SBSC*. *Females* showed slightly higher values for *SBSC* than did *males*. *Female* values for *SBSC* are a little higher than those of the *general population* for *SBSC*. This indicates that men seem to be less concerned with regards to *SBSC*, whereas *females* show concerns verging on borderline as those patients who are concerned /disfigured.

Respondents who replied *Yes* for the *SBSC* scale had similar means to those of the *clinical* populace. Respondents who replied *No* showed similar mean values to the *not concerned* populace.

SBSC values varied with *time spent concerned* by participant such that subjects who spent *<1 hour/day* concerned showed similar means to those of the *unconcerned* populace. Respondents who *>3 hours/day* concerned about their appearance had *SBSC* values almost 100% above those of the *clinical population*. This suggests that individuals who feel consumed with appearance issues show exceeding high values for *SBSC*.

The *Caucasian* group had a higher mean values for *NSC* compared to the other ethnic groups and their results are consistent with those for the *clinical population* on *NSC* values. *Asian/British Asian* and *Black/British Black* showed similar mean values to those of the *general population not concerned* with appearance.

Respondents who replied *Yes* to the body image questions had *NSC* values which were consistent with those of the *clinical population*. The respondents who replied *No* to the body image questions showed similar means to the *not concerned* population.

Females had higher mean values in comparison to *males* for *physical distress and dysfunction* scores. When *physical distress and dysfunction* values were assessed in

conjunction to the body image questions, respondents who replied *Yes* (i.e. had physical distress) showed higher mean values in comparison to the respondents who replied *No*. Finally, *physical distress and dysfunction* scores rose in a stepwise fashion with increasing amounts of time participants expressed concerns over their appearance.

Neither *males* nor *females* were as high as the *clinical population* for *full scores (F-S)*. *Caucasians'* were found to have the highest mean values for *F-S* and this was consistent with the *clinical population*. Both *Asian/British Asian* and *Black/British Black* were found to be consistent with *the general population concerned* group.

9.3. CONCLUSION FOR STUDY TWO

Study Two found that *women* showed more *BDI* differences in comparison to *men* (Murakumi, 2002; Angst *et al*, 2007). People who experienced *stress during the day* along with a previous *history of mental illness* had higher *BDI* values. Interestingly subjects who expressed *Concerns over Slimness* had higher *BDI* responses in comparison to respondents who had *no* such concerns. Respondents who stated that they had *preoccupation and concerns* with their appearance were seen to have higher *BDI* values than those without such concerns. This might suggest that these people are experiencing depressive like symptoms over these particular appearance concerns. This suggests a link that body image concerns, stress are centred on these concerns and its association with depressive like symptoms (Stice *et al*, 1994; Grogan, 2007; NIMH, 2006).

Physiological and *psychological* stressors altered *cortisol* and *sIgA* levels. In particular the acute response to the *psychological* stressors was more effective that the *physiological* response in elevating *sIgA* levels.

The DAS 59 questionnaire indicated *Caucasian females* showed the highest responses to *GSC* scores and *Caucasians* in general were the highest responses to each of the DAS 59 factors. When *GSC* values were compared against the Body Image interview there were higher levels of *GSC* values seen for each of the Body Image Interview questions. This also applied to *SSC, SBSC, NSC* and *physical distress and dysfunction*. In nearly all interactions the *Yes* groups showed similar mean values to those of the *clinical populations* (i.e. those with actual disfigurements). Moreover in all of the factors, when considering *time spent concerned* about appearance the most severely affected cases were subjects who spent *> 3 hours/day* concerned regarding a particular aspect of their appearance.

Overall these findings suggest that respondents perceived their appearance concerns more so as a disfigurement rather than a body image perception or concern.

CHAPTER TEN

10.1. GENERAL DISCUSSION

Overall the findings for Study One suggest that body image and body image concerns are important features for the participants. It appears that weight issues are one of the primary concerns amongst these individuals. Higher *body mass index* values, *history of mental illness* and *relationship status* all appear to be linked, indicating that people with high *body mass index* values were more likely to have experienced mental illness and were less likely to be in relationships. Subjects who had higher *body mass index* values did not rate themselves as attractive compared to subjects who were *lean* and *muscular*. Interestingly, we have shown that subjects who spend less time concerned about their appearance, appear to rate themselves as more attractive compared to others. However, our findings suggest that subjects, who frequently *compared themselves to their peers and friends*, rated themselves higher in terms of appearance. This suggests that our sociocultural views of relationships, peer groups and current weight ideals are of particular importance to people. The findings also found that *media* and *peer pressure* arising from media sources were of particular importance. Subjects felt a variety of pressures from *media film, magazines* and *high street* influences regarding their appearance. This again is supported by our overpowering media dominated society where constant body image ideals for both men and women are generally portrayed as either muscular/athletic physiques for men or slender for women. Overall, *peer pressure* seems to play an integral role within these subjects. Females generally appear to feel and react to pressure more so than males. Subjects who had experienced a *history of mental illness* also felt the effects of *peer pressure* more so

than those with no prior mental illness problems. However, subjects who actively *compared themselves to friends* with regards to their appearance in comparison to subjects who *rarely compared themselves to friends* did not feel the effects of *peer pressure* as much. When subjects were asked if they felt *peer pressure* in comparison to their body type, the *lean* and *muscular* participants felt less *peer pressure* than subjects who considered themselves as endomorphs. When the body image questions and the effects of *appearance ratings* and *peer pressure* were analysed, we see a clear association between the levels of severity expressed with regards to their body image issues. Most subjects reported having relatively little appearance concerns. However, there were a small percentage of subjects who were *extremely concerned* about their appearance, and influenced by *peer pressures* leading to self-reported *preoccupations, distress, impairment, social pressures, daily functioning* and *avoidance*. These subjects would be deemed to have a body image disturbance. A body image disturbance is defined by day to day functioning problems and distress which is caused by particular aspects of appearance.

The overall findings for Study Two again emphasise that *females* appear to be affected by depression type characteristics more so than *males* given the *Beck depression inventory* results. Subjects who had experienced a *history of mental illness* in the past also had higher *Becks depression inventory* scores. We found that when subjects had particular *concerns over slimness* and concerns regarding their appearance this corresponded with higher *Becks depression inventory* scores. This suggests that daily stresses during the day, concerns over weight issues and concerns over appearance cause subjects to experience diminished affect.

There was no effect for cortisol response however there was a marked effect of *sIgA* responses for the *physiological* and *psychological* stressors in comparison to *basal*

levels. As we know, in an acute stress response cortisol production from the adrenals will suppress the immune system. However, subjects who experienced chronic stressful situations, or had a history of mental illness, their over secretion of cortisol production might give rise to cellular exhaustion and immunological deficiencies.

When the Derriford appearance scale subgroups for *general self-consciousness of appearance, social self-consciousness of appearance, sexual and bodily self-consciousness of appearance, negative self-concept* and *physical distress and dysfunction* were compared against the body image questions, all subjects who responded *'yes'* to each of the questions had higher scores than subjects who responded '*no*'. Furthermore, when the *general self-consciousness of appearance, sexual and bodily self-consciousness of appearance* and *physical distress and dysfunction, social self-consciousness of appearance* were compared against how much *time they spent concerned* about their appearance, subjects who spent more than *three hours a day* with concerns had higher DAS 59 subgroup scores than did subjects who spent less about their appearance. Interestingly, *females* scored higher on the *sexual and bodily self-consciousness of appearance* than did *males*.

Collectively these findings suggest that weight issues deeply concern the respondents from both studies. People rated their appearance *lower*, and were less likely to be in a relationship, and were greatly influenced by *peer pressure* if their *BMI* scores were *high* (Carlyle, 2000). Our society holds thin ideals in great regard (Hesse-Biber, 2005), even if this imposes unachievable target for most women (Battle & Brownell, 1996). Another important finding was the amount of time individuals spent on their appearance. The more time spent participants reported being concerned about their appearance, the lower they rated their appearance; this suggests an element of fixation and disturbance. Humans generally have a desire to look their best, and this has been observed

throughout history (Angelogiou, 1970). However, when people start to exhibit signs of body image abnormalities, subjects worry, fixate and spend large amounts of time on their appearance but remain dissatisfied. Our findings suggest that this small number of respondents, who spent large amounts of time on their appearance, could possibly have characteristics of a more severe form of body image disturbance, such as body dysmorphic disorder. Roughly 2% of our subjects showed these characteristics an amount which is representative of the prevalence of body dysmorphic disorder within the population (DSM-IV: Phillips, 2005). Overall, females seemed to have more body image concerns than males, and this is supported by the current literature (Feingold & Mazzella,1998). Subjects who actively compared themselves to their peer groups had overall higher, and more satisfied feelings regarding their appearance.

Respondents also had higher *BDI* scores if they had coincidental weight concerns (Cowan, 1991). *Stomach* areas were of particular concern, and in all the body image questions, *concerns over slimness* was significant, even when compared against the Derriford Appearance Scale. It appears that groups who consider themselves as overweight may feel somewhat targeted and stigmatized (Myers & Rosen, 1999). This could suggest that weight concerns, and being overweight may, in fact, be classed as a disfigurement rather than body image concerns. With so much negativity centred on being overweight from medical, professionals, education, family and peer groups, ‘obese’ is almost classed by others and ergo themselves as a unacceptable body image type. The sociocultural view is the most strongly associated theory for body image disturbance. People’s opinions are influenced by our western society – i.e. through media influence and we now seem to stigmatise overweight people as being different, socially unacceptable and perhaps even outcasts.

10.2. CRITICAL ANALYSIS

10.2.1. STUDY ONE

Study One sample size of 360 participants did not gather enough subjects within the middle and older age categories. The middle age category (26-40 years) had 15% of the total sample size and the old age category (>41 years) had 5% of the total sample size. The study also falls short with no collection of data from particular age and ethnic categories. Further studies need to acquire middle age category Chinese males and older age category Asian/Asian British males and females. Older age category for Black/Black British females, older age category Chinese males and females and did not state ethnicity older age category females. This data would have given more insight in to body image concerns that may arise within these age categories and if any ethnic differences occur with age.

The role of media influence could have been further investigated, extrapolating why subjects feel certain types of media cause them to have concerns and if these concerns are interlinked with current views on sociocultural and Halo effect theories.

10.2.2. STUDY TWO

Study Two stressors i.e. physiological stressor (ice water) and psychological stressor (body image interview, DAS 59 and BDI) are both validated ways in which to manipulate a stress response within subjects. However, measurements taken from the subjects in this study using various techniques such as; saliva collection for cortisol and sIgA assays, blood glucose and blood pressure showed largely no significant effect

when analysed. Although previous research has reported these measurements as a valid means to identify stress effects. Further adjustments are required to gain more comprehensive measurements from subjects during the experiment.

10.2.3. FUTURE STUDIES

Further investigations based on the findings of these studies highlight some interesting observations. High profile people appear to be those most under scrutiny with regards their appearance. Indeed, these individuals show considerable similarities with regards to the public image they portray, within their groups. For instance politicians adopt a 'uniform' largely out of the perceived notion that politicians must look a certain way in order to fulfil that role. Celebrities and artistic performers also exhibit this characteristic, even though they attempt to appear unique and different. In fact they seem to engage in a never-ending 'arms race' by competing with one-another for attention but finish again appearing similar. The present studies have gathered information about appearance from rather selective and unrepresentative sample. Young, economically poor student groups do not necessarily convey accurate information about the greater population as a whole in regards to many issues, and certainly not information about appearance concerns, pressures to conform to ideal images and how these impact on mental health. Therefore, it would be invaluable to expand on the current studies by:

1) Increasing the variety of participants in regards to race, gender, age, cultural background and socio-economic status in order to convey a more expansive and accurate view of the society on a whole.

2) While individual published studies appear from different countries, they are inevitably based on western societies and cultures. If the underlying themes hypothesized to influence or corrupt peoples image ideals are borne out of peer influences, family backgrounds, and media exposure. Then we might expect subject populations form non-western societies to provide convergent validity. For instance, media and peer-to-peer pressures might well cause image concerns for individuals that reflect the type and style of media they are exposed to, and reflect the same degree of peer pressure, even though image ideals which may be dramatically different in that particular country/culture/society. However, such findings would lend considerable weight to the 'proof of concept', i.e. that media and peer pressure cause or create image ideals that members of that group strive to achieve.

3) Increasing the demographic ranges for participant in such studies might well create a more accurate and valid representation of the society as a whole. But within society certain individuals are surely at greater risk from image idealisation simply because they are in the public domain or public eye because of their occupations. Politicians, athletes and celebrities might show exaggerated effects from peers, media and public commentary, and their mental health may well be compromised as a result. For example, eating disorders are common in athletes and celebrities, while politicians are known to employ techniques/staff to create younger, vibrant versions of themselves. Similar body image studies carries out in these select members of society might well demonstrate 'proof of concept' again, but show exaggerated concerns/distress that emphasize or manifest as greater mental health issues such as depression, drug use, eating disorders and so forth. If pressures about image are indeed amplified in such people so too should be the accompany disorders.

4) While studies to date, including the present one focus on an individual's responses to body image concerns and how such concerns or ideas arise, there are no reports as to the stability of these ideals/concerns throughout and individuals lifespan. If peer pressure, media, society and cultural factors influence or modify the individual, it would be highly informative to examine the mutability or immutability of the body image and/or image concerns by measuring such variables in the same subjects in a longitudinal study. The information learned might well detect that external influences on an individual's body image remain intact throughout life, or that the various influences exert more or less profound influences depending on the individual's stage of life. If such influences and body image ideals are shown to be stable or immutable, but still cause distress and mental health concerns such a finding would highlight the need for education, therapy or intervention at an early age, rather the after, in order to prevent such pathologies from becoming manifest.

APPENDIX I

STUDY ONE - CONSENT FORM & QUESTIONNAIRE

The consent form as shown below was signed by all willing participants before the questionnaire.

Consent Form

This questionnaire is intended to assess your body image perception and the factors that influence this. By completing this questionnaire and signing this consent form you are giving permission for your answers to be used as part of our research. Please note that all answers will be kept strictly confidential and will not be used for any other purpose than for statistical analysis as part of this research study.

I confirm that I am over the age of eighteen and consent for any information that I give to be used as part of a research study

Sign ……. Date …….

Questionnaire

Please complete this questionnaire as accurately and honestly as possible. Please **DO NOT** include your name or any details by which you may be identified as all answers are intended to be anonymous and will be kept strictly confidential. If you have any queries at any point relating to the questionnaire please speak to one of our research team.

1. Gender: □Male □Female

2. Age: □18-21 □22-25 □26-30 □31-40 □41-50 □50+

3. Ethnicity: □White □Asian or British Asian □Black or Black British □Chinese □Other

4. Marital status: □Single □In a relationship but living separately □In a relationship but living together □Married □Divorced □Widowed

5. Sexual Preference: □Heterosexual □Homosexual □Bisexual □Asexual

(Please answer honestly, if not know we have provided equipment to measure these)

6. Weight:…… kg or ……stones ……

7. Height:…… m or ……ft …… inches

8. How do you rate your appearance out of 10? *(Please circle, 1 being worst and 10 being the best)*

1 2 3 4 5 6 7 8 9 10

9. How do you rate your body? (*Please circle***)**

Lean Muscle Fat No comment

10. Do you feel you compare yourself to your friends?*(Tick as applicable)*

□Always □Often □Occasionally □Rarely □Never

11. Do you generally think you are better looking than your friends?

□Yes □No

12. Do you feel pressure to look good from your friendship groups? (*Please circle 1 no pressure, 10 constant pressure***)**

1 2 3 4 5 6 7 8 9 10

13. Do you think that the media puts pressure on people with regards to image? (*Please circle 1 no pressure, 10 constant pressure***)**

1 2 3 4 5 6 7 8 9 10

14. Do you feel pressure from the media with regards to your own image? (*Please circle 1 no pressure, 10 constant pressure***)**

1 2 3 4 5 6 7 8 9 10

15. From which media sources do you get ideas concerning image?*(Please tick as many as are applicable)*

□None □Books □Magazines □Television
□Radio □Film □High Street □Other please state……

16. Have you ever had cosmetic surgery?

□Yes (*If yes please go to Q.20)* □No

17. Would you ever consider having cosmetic surgery?

□Yes □No □Maybe

18. Have you ever been diagnosed with a mental illness?

□Yes □No

If yes please give details *(Remember you do not have to answer this question and all information provided is completely anonymous)*

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19. Do you drink alcohol? *(If no please go to question 21)*

□Yes □No

20. How many units of alcohol do you drink daily and weekly?

Daily_____units

Weekly_____units

21. Have you ever taken recreational drugs?

□Regularly □Sometimes □Rarely □Only Once □No □No comment

22. Are you concerned about the appearance of some part(s) of your body, which you consider especially unattractive?

□Not at all concerned □Somewhat concerned □Moderately concerned □Very concerned □Extremely concerned

23. If you are at least concerned, do these concerns preoccupy you? That is, you think about them a lot and they're hard to stop thinking about?

□Not at all Concerned □Somewhat Concerned □Moderately Concerned □Very Concerned □Extremely Concerned

24. Has your physical difference often caused you a lot of distress, torment or pain? How much?

□Not at all □Somewhat □Moderate □Very □Extreme

25. Has your physical difference often caused you impairment in social, occupational or other important areas of functioning? How much?

□Not at all □Somewhat □Moderate □Very □Extreme

26. Has your physical difference significantly interfered with your social life? How much?

□Not at all □Somewhat □Moderately □Very Often□Extremely Often

27. Has your physical difference significantly interfered with your schoolwork / your job, or your ability to function in your role? How much?

□Not at all □Somewhat □Moderately □Very Often □Extremely Often

28. Do you ever avoid things because of your physical difference? How often?

□Not at all □Somewhat □Moderately □Very Often □Extremely Often

If so please expand----------

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29. How much time per day do you spend thinking about the difference?

□0-1 hour □ 1-3 hours □ +3 hours

30. Which area of your body are you most concerned about?

□Face □Chest □Stomach □Arms □Legs □Buttocks □Miscellaneous

Any additional comments:----------

APPENDIX II

STUDY ONE NON SIGNIFICANT DATA

Independent Variable	**Dependant Variable**	**Significance**
Sex	Self Rating of Appearance	(F(1,356)=1.839, p>0.1759
Sex	Self versus Others	(F(1,357=0.568, p>0.4514
Sex	Media pressure in general	(F(1,357)=0.134, p>0.7149
Sex	Media pressure self	(F(1,357)=0.001, p>0.9784
Sex	Alcohol units/day	F(1,356)=2.211, p>0.1379
Sex	TV hours watched in a day	(F(1,357)=0.183, p>0.6693
Age	Self Rating of Appearance	(F(2,356)=0.550, p>0.5773
Age	Self versus Others	(F(2,357=0.668, p>0.5131
Age	Peer Pressure	(F(2,357)=0.913, p>0.4024
Age	Media pressure in general	(F(2,357)=0.275, p>0.7597
Age	Media pressure self	(F(2,357)=1.195, p>0.3039
Age	Alcohol units/day	(F(2,356)=1.897, p>0.1516
Age	Alcohol units/week	(F(2,356)=2.670, p>0.0706
Age	TV hours watched in a day	(F(2,357)=0.310, p>0.7335
Partner	Self Rating of Appearance	(F(2,356)=0.550, p>0.5773
Partner	Self versus Others	(F(2,357)=0.668, p>0.5131
Partner	Peer Pressure	(F(2,357)=0.913, p>0.4024
Partner	Media pressure in general	(F(2,357)=0.275, p>0.7597
Partner	Media pressure self	(F(2,357)=1.195, p>0.3039
Partner	Alcohol units/day	(F(2,356)=1.897, p>0.1516
Partner	Alcohol unit/week	(F(2,356)=2.670, p>0.0706
Partner	TV hours watched in a day	(F(2,357)=0.310, p>0.7335
Mate choice	BMI	(F(2,325)=2.783, p>0.0633

Mate choice	Self rating of Appearance	(F(2,356)=0.700, p>0.4972
Mate choice	Peer Pressure	(F(2,357)=0.999, p>0.3694
Mate choice	Media pressure in general	(F(2,357=2.356, p>0.0963
Mate choice	Media pressure self	(F(2,357)=1.147, p>0.3187
Mate choice	Alcohol intake	(F(2,356)=2.471, p>0.0860
Mate choice	Alcohol units/week	(F(2,356)=2.676, p>0.0702
Cosmetic Surgery	BMI	(F(1,325)=1.411, p>0.2357
Cosmetic Surgery	Self rating of Appearance	(F(1,356)=0.0679,p>0.0679
Cosmetic Surgery	Self versus Others	(F(1,357)=0.012, p>0.9114
Cosmetic Surgery	Peer Pressure	(F(1,357)=0.038, p>0.8446
Cosmetic Surgery	Media pressure in general	(F(1,357)=0.191, p>0.6620
Cosmetic Surgery	Media pressure self	(F(1,357)=0.339, p>0.5607
Cosmetic Surgery	Alcohol intake	(F(1,357)=0.192, p>0.6616
Cosmetic Surgery	Alcohol units/day	(F(1,357)=0.012, p>0.9121
Cosmetic Surgery	Alcohol units/week	(F(1,357)=0.154, p>0.6947
Cosmetic Surgery	TV hours watched in a day	(F(1,357)=0.136, p>0.7126
Future Possible Surgery	BMI	(F(2,325)=2.900, p>0.0564
Future Possible Surgery	Self Rating of Appearance	(F(2,356)=1.857, p>0.1576
Future Possible Surgery	Self versus Others	(F(2,357)=0.313, p>0.7316
Future Possible Surgery	Peer Pressure	(F(2,357)=1.223, p>0.2956
Future Possible Surgery	Media pressure in general	(F(2,357)=0.125, p>0.8828
Future Possible Surgery	Media pressure self	(F(2,357)=0.113, p>0.8931
Future Possible Surgery	TV hours watch in a day	(F(2,357)=0.528, p>0.5903
Exercise	BMI	(F(2,324)=2.975, p>0.0525
Exercise	Self versus Others	(F(2,356)=0.719, p>0.4878
Exercise	Alcohol intake	(F(2,355)=0.56, p>0.9457

Exercise	Alcohol units/day	(F(2,355)=0.127, p>0.8804
Exercise	Alcohol units/week	(F(2,355)=0.104, p>0.9015
Self Rating of Body	Self versus Others	(F(3,356)=1.465, p>0.2238
Self Rating of Body	Alcohol intake	(F(3,355)=1.306, p>0.2721
Self Rating of Body	Alcohol units/week	(F(3,355)=2.583, p>0.0532
Time spent concerned	BMI	(F(3,324)=22.327, p>0.2854
Time spent concerned	Self versus Others	(F(3,356)=0.710, p>0.5468
Time spent concerned	Peer Pressure	(F(3,356)=2.580, p>0.0534
Time spent concerned	Media pressure in general	(F(3,356)=0.476, p>0.6994
Time spent concerned	Media pressure self	(F(3,356)=0.513, p>0.6735
Time spent concerned	Alcohol intake	(F(3,355)=1.450, p>0.2279
Time spent concerned	Alcohol units/week	(F(3,355)=1.381, p>0.2482
Time spent concerned	TV hours watched in a day	(F(3,356)=0.540, p>0.6554
History of Mental health	Self versus Others	(F(2,357)=0.378, p>0.6858
History of Mental health	Media pressure in general	(F(2,357)=0.534, p>0.5866
History of Mental health	Media pressure self	(F(2,357)=0.215, p>0.8068
History of Mental health	TV hours watched in a day	(F(2,357)=0.634, p>0.5309
Ethnicity	Self Rating of Appearance	(F(4,349)=1.995, p>0.0948
Ethnicity	Self versus Others	(F(4,350)=0.351, p>0.8434
Ethnicity	Peer Pressure	(F(4,350)=2.287, p>0.0597
Ethnicity	Media pressure in general	(F(4,350)=0.966, p>0.4260
Ethnicity	Media pressure self	(F(4,350)=0.673, p>0.6107
Ethnicity	TV hours watched in a day	(F(4,350)=0.434, p>0.7843
Comparison to friends	Self versus Others	(F(3,277)=2.475, p>0.0618
Comparison to friends	BMI	(F(3,255)=19.09, p>0.1285
Comparison to friends	Media pressure in general	(F(3,277=1.143, p>0.3322

Comparison to friends	Media pressure self	(F(3,277)=0.067, p>0.9775
Comparison to friends	TV hours watched in a day	(F(3,277)=1.478, p>0.2208
Recreational Drug	BMI	(F(3,82)=0.055, p>0.9827
Recreational Drug	Self Rating of Appearance	(F(3,88)=0.463, p>0.7089
Recreational Drug	Self versus Others	(F(3,88)=0.582, p>0.6286
Recreational Drug	Media pressure in general	(F(3,88)=1.372, p>0.2567
Recreational Drug	Media pressure self	(F(3,88)=1.424, p>0.2412
Recreational Drug	Alcohol intake	(F(3,88)=1.087, p>0.3588
Recreational Drug	Alcohol units/day	(F(3,88)=1.408, p>0.2457
Recreational Drug	Alcohol units/week	(F(3,88)=2.020, p>0.1169
Recreational Drug	TV hours watched in a day	(F(3,88)=1.392, p>0.2505
Media: TV	BMI	(F(1,320)=0.149, p>0.6993
Media: TV	Self Rating of Appearance	(F(1,351)=1.910, p>0.1678
Media: TV	Self versus Others	(F(1,352)=1.073, p>0.3010
Media: TV	Peer Pressure	(F(1,352)=2.709, p>0.1007
Media: TV	Media pressure in general	(F(1,352)=0.344, p>0.5578
Media: TV	Media pressure self	(F(1,352)=0.045, p>0.8319
Media: TV	Alcohol intake	(F(1,351)=1.696, p>0.1936
Media: TV	Alcohol units/day	(F(1,351)=0.039, p>0.8428
Media: TV	Alcohol units/week	(F(1,351)=1.082, p>0.2991
Media: TV	TV hours watched in a day	(F(1,352)=2.270, p>0.1328
Media: Film	BMI	(F(1,321)=1.971, p>0.1613
Media: Film	Self Rating of Appearance	(F(1,352)=0.115, p>0.7344
Media: Film	Media pressure in general	(F(1,353)=0.061, p>0.8046
Media: Film	Media pressure self	(F(1,353)=0.924, p>0.3371
Media: Film	Alcohol intake	(F(1,352)=3.023, p>0.0830

Media: Film	Alcohol units/day	(F(1,352)=3.725, p>0.0544
Media: Film	Alcohol units/week	(F(1,352)=3.509, p>0.0619
Media: Film	TV hours watched in a day	(F(1,353)=0.032, p>0.8584
Media: Magazines	BMI	(F(1,319)=2.450, p>0.1185
Media: Magazines	Self Rating of Appearance	(F(1,350)=0.190, p>0.6635
Media: Magazines	Self versus Others	(F(1,351)=2.401, p>0.1221
Media: Magazines	Media pressure in general	(F(1,351)=2.245, p>0.1350
Media: Magazines	Media pressure self	(F(1,351)=0.099, p>0.7536
Media: Magazines	Alcohol intake	(F(1,351)=1.489, p>0.2231
Media: Magazines	Alcohol units/day	(F(1,350)=0.125, p>0.7240
Media: Magazines	Alcohol units/week	(F(1,350)=1.367, p>0.2431
Media: Magazines	TV hours watched in a day	(F(1,351)=0.121, p>0.7284
Media: High Street	BMI	(F(1,321)=0.573, p>0.4498
Media: High Street	Self Rating of Appearance	(F(1,352)=0.203, p>0.6523
Media: High Street	Self versus Others	(F(1,353)=1.027, p>0.3114
Media: High Street	Media pressure self	(F(1,353)=0.297, p>0.5862
Media: High Street	Alcohol intake	(F(1,352)=3.246, p>0.0724
Media: High Street	Alcohol units/day	(F(1,352)=0.085, p>0.7709
Media: High Street	Alcohol units/week	(F(1,353)=2.180, p>0.1407
Media: High Street	TV hours watched in a day	(F(1,353)=1.270, p>0.2605
Media: Other	BMI	(F(1,320)=0.182, p>0.6697
Media: Other	Self Rating of Appearance	(F(1,351)=0.539, p>0.4631
Media: Other	Self versus Others	(F(1,352)=0.367, p>0.5449
Media: Other	Peer Pressure	(F(1,352)=0.073, p>0.7873
Media: Other	Media pressure in general	(F(1,352)=0.009, p>0.9264
Media: Other	Media pressure self	(F(1,352)=0.275, p>0.6004

Media: Other	Alcohol intake	(F(1,351)=1.068, p>0.3021
Media: Other	Alcohol units/day	(F(1,351)=0.261, p>0.6097
Media: Other	Alcohol units/week	(F(1,351)=0.005, p>0.9434
Media: Other	TV hours watched in a day	(F(1,352)=1.268, p>0.2609
Body area: Face	BMI	(F(1,324)=2.757, p>0.0978
Body area: Face	Self versus Others	(F(1,356)=1.993, p>0.1589
Body area: Face	Peer Pressure	(F(1,356)=1.560, p>0.2126
Body area: Face	Media pressure in general	(F(1,356)=0.758, p>0.3846
Body area: Face	Media pressure self	(F(1,356)=1.098, p>0.2955
Body area: Face	Alcohol intake	(F(1,355)=0.001, p>0.9709
Body area: Face	Alcohol units/day	(F(1,355)=0.014, p>0.9059
Body area: Face	Alcohol units/week	(F(1,355)=0.036, p>0.8491
Body area: Face	TV hours watched in a day	(F(1,356)=1.395, p>0.2383
Body area: Chest	BMI	(F(1,324)=0.223, p>0.6372
Body area: Chest	Self Rating of Appearance	(F(1,355)=1.952, p>0.1632
Body area: Chest	Self versus Others	(F(1,356)=0.722, p>0.3961
Body area: Chest	Peer Pressure	(F(1,356)=0.326, p>0.5684
Body area: Chest	Media pressure in general	(F(1,356)=1.285, p>0.2577
Body area: Chest	Media pressure self	(F(1,356)=0.693, p>0.4058
Body area: Chest	Alcohol intake	(F(1,355)=0.114, p>0.7362
Body area: Chest	Alcohol units/day	(F(1,355)=0.245, p>0.6209
Body area: Chest	Alcohol units/week	(F(1,355)=0.176, p>0.6751
Body area: Chest	TV hours watched in a day	(F(1,356)=0.435, p>0.5099
Body area: Arms	Self versus Others	(F(1,356)=1.676, p>0.1963
Body area: Arms	Peer Pressure	(F(1,356)=0.312, p>0.5765
Body area: Arms	Media pressure in general	(F(1,356)=0.672, p>0.4130

Body area: Arms	Media pressure self	(F(1,356)=0.217, p>0.6414
Body area: Arms	Alcohol intake	(F(1,355)=3.350, p>0.0680
Body area: Arms	Alcohol units/day	(F(1,355)=3.488, p>0.0626
Body area: Arms	TV hours watched in a day	(F(1,356)=0.426, p>0.5143
Body area: Stomach	Self versus Others	(F(1,356)=1.883, p>0.1708
Body area: Stomach	Peer Pressure	(F(1,356)=2.870, p>0.0911
Body area: Stomach	Media pressure in general	(F(1,356)=7.365,p>0.9978
Body area: Stomach	Media pressure self	(F(1,356)=0.236, p>0.6277
Body area: Stomach	Alcohol units/week	(F(1,355)=2.805, p>0.0949
Body area: Stomach	TV hours watched in a day	(F(1,356)=0.061, p>0.8055
Body area: Buttocks	BMI	(F(1,323)=1.540, p>0.2154
Body area: Buttocks	Self Rating of Appearance	(F(1,354)=2.011, p>0.1570
Body area: Buttocks	Self versus Others	(F(1,355)=1.727, p>0.1897
Body area: Buttocks	Peer Pressure	(F(1,355)=0.913, p>0.3399
Body area: Buttocks	Media pressure in general	(F(1,355)=0.393, p>0.5310
Body area: Buttocks	Media pressure self	(F(1,355)=0.016, p>0.8995
Body area: Buttocks	Alcohol intake	(F(1,354)=1.742, p>0.1878
Body area: Buttocks	TV hours watched in a day	(F(1,355)=0.492, p>0.4836
Body area: Legs	BMI	(F(1,323)=0.038, p>0.8453
Body area: Legs	Self versus Others	(F(1,355)=0.215, p>0.6430
Body area: Legs	Media pressure in general	(F(1,355)=0.174, p>0.6768
Body area: Legs	Media pressure self	(F(1,355)=0.113. p>0.7369
Body area: Legs	Alcohol intake	(F(1,354)=0.570, p>0.4506
Body area: Legs	Alcohol units/day	(F(1,354)=3.742, p>0.0539
Body area: Legs	Alcohol units/week	(F(1,354)=1.074, p>0.3006
Body area: Legs	TV hours watched in a day	(F(1,355)=0.235, p>0.6284

Body area: Misc	BMI	(F(1,324)=1.659, p>0.1986
Body area: Misc	Self versus Others	(F(1,356)=1.515, p>0.2192
Body area: Misc	Peer Pressure	(F(1,356)=0.144, p>0.7041
Body area: Misc	Media pressure in general	(F(1,356)=0.488, p>0.4851
Body area: Misc	Media pressure self	(F(1,356)=1.097, p>0.2957
Body area: Misc	Alcohol intake	(F(1,355)=1.430, p>0.2326
Body area: Misc	Alcohol units/day	(F(1,355)=0.121, p>0.7285
Body area: Misc	Alcohol units/week	(F(1,355)=1.835, p>0.1763
Body area: Misc	TV hours watched in a day	(F(1,355)=0.580, p>0.4467
Preoccupation & Concern	BMI	(F(4,320)=1.752, p>0.1384
Preoccupation & Concern	Self versus Others	(F(4,351)=0.999, p>0.4079
Preoccupation & Concern	Media pressure in general	(F(4,351)=0.037, p>0.9974
Preoccupation & Concern	Media pressure self	(F(4,351)=0.039, p>0.9971
Preoccupation & Concern	Alcohol intake	(F(4,350)=1.043, p>0.3847
Preoccupation & Concern	Alcohol units/day	(F(4,350)=2.215, p>0.0670
Preoccupation & Concern	Alcohol units/week	(F(4,350)=1.191, p>0.3145
Preoccupation & Concern	TV hours watched in a day	(F(4,351)=0.295, p>0.8813
Concerns & Distress	BMI	(F(4,320)=0.930, p>0.4468
Concerns & Distress	Self versus Others	(F(4,352)=0.714, p>0.5829
Concerns & Distress	Media pressure self	(F(4,352)=1.314, p>0.2642
Concerns & Distress	Alcohol intake	(F(4,351)=0.623, p>0.6465
Concerns & Distress	Alcohol units/day	(F(4,351)=1.398, p>0.2342
Concerns & Distress	Alcohol units/week	(F(4,351)=1.358, p>0.2480
Concerns & Distress	TV hours watched in a day	(F(4,352)=2.036, p>0.0889
Concerns which Impair	BMI	(F(3,321)=1.862, p>0.1359
Concerns which Impair	Self versus Others	(F(3,352)=0.996, p>0.3946

Concerns which Impair	Media pressure in general	(F(3,352)=0.142, p>0.9345
Concerns which Impair	Media pressure self	(F(3,352)=0.021, p>0.9958
Concerns which Impair	Alcohol intake	(F(3,351)=0.630, p>0.5964
Concerns which Impair	Alcohol units/week	(F(3,351)=2.126, p>0.0966
Concerns which Impair	TV hours watched in a day	(F(3,352)=0.150, p>0.9295
Social Setting Concerns	BMI	(F(4,322)=0.965, p>0.4270
Social Setting Concerns	Self versus Others	(F(4,354)=1.939, p>0.1035
Social Setting Concerns	Media pressure in general	(F(4, 354)=0.067, p>0.9917
Social Setting Concerns	Media pressure self	(F(4,354)=0.108, p>0.9796
Social Setting Concerns	Alcohol intake	(F(4,353)=0.868, p0.4829
Social Setting Concerns	Alcohol units/day	(F(4,353)=1.588, p>0.1770
Social Setting Concerns	Alcohol units/week	(F(4,353)=1.447, p>0.2180
Social Setting Concerns	TV hours watched in a day	(F(4,354)=0.121, p>0.9748
Concerns over functioning	BMI	(F(4,321)=0.205, p>0.9357
Concerns over functioning	Self versus Others	(F(4,353)=0.762, p>0.5505
Concerns over functioning	Peer Pressure	(F(4,353)=2.209, p>0.0676
Concerns over functioning	Media pressure in general	(F(4,353)=0.348, p>0.8452
Concerns over functioning	Media pressure self	(F(4,353)=0.217, p>0.9289
Concerns over functioning	Alcohol intake	(F(4,352)=0.591, p>0.6695
Concerns over functioning	Alcohol units/day	(F(4,352)=1.100, p>0.3563
Concerns over functioning	Alcohol units/week	(F(4,352)=1.219, p>0.3025
Concerns over functioning	TV hours watched in a day	(F(4,353)=0.444, p>0.7767
Avoidance concerns	BMI	(F(4,321)=1.225, p>0.3000
Avoidance concerns	Self versus Others	(F(4,353)=0.433, p>0.7848
Avoidance concerns	Media pressure in general	(F(4,353)=0.506, p>0.7312
Avoidance concerns	Media pressure self	(F(4,353)=0.551, p>0.6983

Avoidance concerns	Alcohol intake	(F(4,352)=1.189, p>0.3153
Avoidance concerns	Alcohol units/day	(F(4,352)=1.220, p>0.3020
Avoidance concerns	Alcohol units/week	F(F4,352)=0.968, p>0.4251
Avoidance concerns	TV hours watched in a day	(F(4,353)=0.790, p>0.5321

APPENDIX III

STUDY TWO EXPLANATORY STATEMENT & CONSENT

Explanatory Statement & Consent

Project Title - Disruption of the hypothalamic-pituitary-adrenal axis circadian patterns in the general populace: Role of stress and body image.

Principal Investigator – Dr J W Smythe, PhD, Chartered Psychologist,
School of Life Sciences,
Senior Lecturer in Pharmacology.

Secondary Investigator - Miss S Noutch, Bsc, Reading for PhD,
School of Life Sciences.

Background to the study

Stress seems to be an ever increasing factor within today's society. Every day we seem to be faced with a multitude of physical and emotional stressors.

Chronic exposure to stress leads to detrimental effects on an individual and thus our stress responses are closely regulated.

This study concentrates on the effects of varying stressors we face in today's modern society. Stressors can be diverse in nature and everyone responds in an individual manner.

Our study focuses on the relationship between peoples individual stress perceptions and attitudes about body image. Attitudes about body image are influenced by different sources, including media, peers and parental guidance along with societal trends, but do these vary with a person's perception of stress.

Participation in the study

You are being asked to participate in a stress test and a series of questionnaires aimed at measuring people's perceptions of body image and corresponding stress levels

Stress Test – this will consist of the volunteer to produce a saliva and blood glucose sample prior to the stress test. For the stress test participant will place their hand in ice water for 2 minutes and saliva and blood samples will be obtained upon on removal of their hands from the ice water and 30 minutes later.

Questionnaires – The questionnaires will consist of the Derriford Appearance scale, Beck Depression Inventory, the multidimensional body-self relations questionnaire, the body image interview.

Exclusion Criteria

Subjects will be excluded if they suffer from peripheral vascular disorders. If they are under 18 years of age. If they are non-English speaking. Or if they have poor vision i.e. partially sighted or blind volunteers.

Storage of Records

All records of subject data will be stored confidentially with only the Principal Investigator and the Secondary Investigator having access to the information.

Risks

Some discomfort may be experienced during the stress test as this incorporates placing the volunteers hand in iced water for 2 minutes. If at any point the volunteer feels discomfort they can remove their hand at any time. A small amount of blood will be taken at three time points using a diabetic pen. If the volunteer is uncomfortable with this then the volunteer can decline or choose to provide only saliva.

The series of questionnaires and interview may be emotionally challenging for the volunteer. If this occurs then the volunteer can decline to give the information.

ALL VOLUNTEERS CAN WITHDRAW FROM THE EXPERIMENT AT ANYTIME.

If you would like to participate in this study please sign below.

Volunteer…….

Date……..

Witness…….

APPENDIX IV

STUDY TWO – ASSESSMENT SHEET

Assessment Sheet

(Researcher to fill in)

Reference Number:	
Date:	
Time:	

(Volunteer to fill in) **Please circle and fill in where appropriate.**

Gender: Male Female

Age: 18-23 24-29 30-35 36-41 42-47

48-53 54-59 60-65 66-7 >72

Weight: _____

Height: _____

How is your overall general health? **Excellent** **Average** **Poor**

Hour many hours of television do

you watch per day approximately? _____

Do you often get stressed during

your daily routine? **Yes** **No**
Sometimes

Have you had any history of

Mental illness in the past? **Yes** **No**

Ethnicity: **Caucasian** **Asian/British Asian**

Black/British Black **Chinese**

Other

APPENDIX V

STUDY TWO – DATA COLLECTION SHEET

Data Collection Sheet

Subject Reference_____

Blood Glucose

Pre Stressor Yes No

Blood Pressure

Pre Stressor_____

Saliva Pre Stressor Yes No

Saliva Post Stressor Yes No

Blood Glucose

Post Stressor Yes No

Blood Pressure

Post Stressor_____

_____

Questionnaire and

Interview Complete Yes No

_____

Saliva Post 30min

Stressor Yes No

Blood Glucose

Post 30mins

Stressor Yes No

Blood Pressure

Post 30mins

Stressor_____

_____

Any other comments:

_____

_____

_____

APPENDIX VI

STUDY TWO – BODY IMAGE INTERVIEW

Body Image Interview

Ref:

Date:

Before Interview please ask the participant to either state Yes or No to the following questions.

(Please circle the appropriated response)

Are you concerned about the appearance of some part(s) of your body, which you consider especially unattractive?

YES NO

Does any aspect of your physical difference preoccupy and concern you?

YES NO

Has your physical difference caused you a lot of distress?

YES NO

Has your physical difference often caused you impairment in social, occupational or other important areas?

YES NO

Has your physical difference significantly interfered with your social life?

YES NO

Has your physical difference significantly interfered with your work / your job, or your ability to function in your role?

YES NO

Do you ever avoid things because of your physical difference?

YES NO

Is your main concern over slimness?

YES NO

On average how long do you spend concerned about your appearance?

<1 hr/day 1-3hr/day >3hr/day

Derriford Appearance Scale

This instrument could not be included due to copyright laws.

Becks Depression Inventory

This instrument could not be included due to copyright laws.

APPENDIX VII

STUDY TWO – NON SIGNIFICANT DATA

Independent variable	Dependent variable	Significance
Sex	TV hours watched in a day	(F(1,57)=0.570, p>0.4533
Sex	Exposure to ice (secs)	(F(1,57)=1.022, p>0.3163
Sex	Beats per minute	(F(2,57)=3.065, p>0.0505
Sex	Blood Glucose	(F(2,57)=1.783, p>0.1730
Sex	Social Self-consciousness of appearance	(F(1,57)=2.641, p>0.1098
Sex	Negative Self-concept	(F(1,55)=1.092, p>0.3006
Sex	Facial Self-consciousness of appearance	(F(1,55)=1.286, p>0.2618
Sex	sIgA	(F(2,54)=1.245, p>0.2921
Age	TV hours watched per day	(F(2,56)=0.551, p>0.5792
Age	Exposure to ice (secs)	(F(2,56)=0.348, p>0.7076
Age	Beck's Depression Inventory	(F(2,56)=1.620, p>0.2070
Age	General Self-consciousness of appearance	(F(2,54)=1.556, p>0.2202
Age	Sexual & Bodily Self-consciousness of appearance	(F(2,54)=1.166, p>0.3192
Age	Negative Self-concept	(F(2,54)=0.395, p>0.6758
Age	Facial Self-consciousness of appearance	(F(2,54)=1.838, p>0.1690
Age	Beat per minute	(F(2,56)=0.381, p>0.8219
Age	sIgA	(F(4,53)=0.434, p>0.7835
General Health	TV hours watched per day	(F(1,57)=3.033, p>0.0870

General Health	Exposure to ice (secs)	(F(1,57)=0.458, p>0.5015
General Health	Beck's Depression Inventory	(F(1,57)=2.542, p>0.1164
General Health	Sexual & Bodily Self-consciousness of appearance	(F(1,55)=0.984, p>0.3257
General Health	Facial Self-consciousness of appearance	(F(1,55)=0.491, p>0.4862
General Health	Physical Distress and Dysfunction	(F(1,55)=0.529, p>0.4703
General Health	BMI	(F(1,57)=1.037, p>0.3129
General Health	Beats per minute	(F(2,57)=0.500, p>0.6077
General Health	Blood Glucose	(F(2,54)=0.226, p>0.7981
General Health	sIgA	(F(2,54)=0.033, p>0.9676
Stressed during the day	TV hours watched per day	(F(2,56)=0.851, p>0.4322
Stressed during the day	Exposure to ice (secs)	(F(2,56)=0.1084, p>0.1084
Stressed during the day	Beats per minute	(F(2,56)=0.302, p>0.7398
Stressed during the day	Blood Glucose	(F(2,56)=0.453, p>0.6363
Stressed during the day	General Self-consciousness of Appearance	(F(2,54)=2.511, p>0.0907
Stressed during the day	Social Self-consciousness of Appearance	(F(2,54)=2.957, p>0.0604
Stressed during the day	Sexual & Bodily Self-consciousness of Appearance	(F(2,54)=2.400, p>0.1004
Stressed during the day	Negative Self-concept	(F(2,54)=0.501, p>0.6085
Stressed during the day	Facial Self-consciousness of appearance	(F(2,54)=0.957, p>0.3903
Stressed during the day	BMI	(F(2,56)=1.206, p>0.3072
History of Mental illness	TV hours watched per day	(F(1,57)=0.017, p>0.8978

History of Mental illness	Beats per minute	(F(1,57)=2.179, p>0.1417
History of Mental illness	Blood Glucose	(F(1,57)=0.399, p>0.5286
History of Mental illness	Facial Self-consciousness of appearance	(F(1,55)=0.108, p>0.7433
History of Mental illness	BMI	(F(1,57)=0.488, p>0.4877
History of Mental illness	sIgA	(F(1,57)=1.231, p>0.2688
Preoccupation & Concern	TV hours watched per day	(F(1,54)=0.099, p>0.7546
Preoccupation & Concern	Exposure to ice (secs)	(F(1,54)=0.002, p>0.9645
Preoccupation & Concern	Blood Glucose	(F(1,54)=0.670, p>0.4141
Preoccupation & Concern	Facial Self-consciousness of appearance	(F(1,53)=1.867, p>0.1776
Preoccupation & Concern	Exposure to ice (secs)	(F(1,54)=0.013, p>0.9098
Preoccupation & Concern	BMI	(F(1,54)=2.289, p>0.1361
Preoccupation & Concern	sIgA	(F(2,54)=0.900, p>0.4098
Concerns & Distress	TV hours watched per day	(F(1,54)=0.274, p>0.6025
Concerns & Distress	Exposure to ice (secs)	(F(1,54)=0.272, p>0.6040
Concerns & Distress	Beats per minute	(F(1,54)=1.493, p>0.2235
Concerns & Distress	Blood Glucose	(F(1,54)=1.977, p>0.1617
Concerns & Distress	Social Self-consciousness of appearance	(F(1,53)=2.657, p>0.1090
Concerns & Distress	Facial Self-consciousness of appearance	(F(1,53)=0.917, p>0.3425
Concerns & Distress	BMI	(F(1,54)=1.074, p>0.3046
Concerns & Distress	sIgA	(F(2,54)=0.183, p>0.8334
Concerns which impair	TV hours watched per day	(F(1,54)=0.090, p>0.7657
Concerns which impair	Exposure to ice (secs)	(F(1,54)=0.293, p>0.5907
Concerns which impair	Blood Glucose	(F(1,54)=1.498, p>0.2228
Concerns which impair	Facial Self-consciousness	(F(1,53)=0.0085, p>0.9306

	of appearance	
Concerns which impair	BMI	(F(1,54)=2.028, p>0.1602
Concerns which impair	sIgA	(F(2,54)=0.200, p>0.8189
Concerns over functioning	TV hours watched per day	(F(1,54)=0.048, p>0.8266
Concerns over functioning	Exposure ton ice (secs)	(F(1,54)=0.275. p>0.6019
Concerns over functioning	Beats per minute	(F(1,54)= 0.008, p>0.9272
Concerns over functioning	Blood Glucose	(F(1,54)=0.032, p>0.8589
Concerns over functioning	Facial Self-consciousness of appearance	(F(1,53)=0.129, p>0.7206
Concerns over functioning	BMI	(F(1,53)=0.812, p>0.3715
Concerns over functioning	sIgA	(F(1,54)=0.080, p>0.9235
Social Setting Concerns	TV hours watched per day	(F(1,54)=0.182, p>0.6715
Social Setting Concerns	Exposure to ice (secs)	(F(1,54)=3.611, p>0.0627
Social Setting Concerns	Beats per minute	(F(1,54)=0.029, p>0.8648
Social Setting Concerns	Blood Glucose	(F(1,54)=0.874, p>0.3512
Social Setting Concerns	Becks Depression Inventory	(F(1,54)=3.727, p>0.0588
Social Setting Concerns	General Self-consciousness of appearance	(F(1,53)=0.804, p>0.3740
Social Setting Concerns	Social Self-consciousness of appearance	(F(1,53)=0.077, p>0.7829
Social Setting Concerns	Sexual & Bodily Self-consciousness of appearance	(F(1,53)=0.023, p>0.8802
Social Setting Concerns	Negative Self-Concept	(F(1,53)=1.308, p>0.2580
Social Setting Concerns	Facial Self-consciousness of appearance	(F(1,53)=1.291, p>0.2610
Social Setting Concerns	Physical Distress & Dysfunction	(F(1,53)-0.310, p>0.5803

Social Setting Concerns	BMI	(F(1,54)=0.050, p>0.8236
Avoidance Concerns	TV hours watched per day	(F(1,54)=0.146, p>0.7044
Avoidance Concerns	Exposure to ice (secs)	(F(1,54)=0.036, p>0.8503
Avoidance Concerns	Beats per minute	(F(1,54)=0.006, p>0.9407
Avoidance Concerns	Facial Self-consciousness of appearance	(F(1,53)=2.180, p>0.1458
Avoidance Concerns	BMI	(F(1,54)=0.654, p>0.4223
Avoidance Concerns	sIgA	(F(2,54)=0.248, p>0.7808
Time Spent Concerned	TV hours watched per day	(F(2,53)=0.110, p>0.8958
Time Spent Concerned	Exposure to ice (secs)	(F(2,53)=0.152, p>0.5898
Time Spent Concerned	Beats per minute	(F(2,53)=0.248, p>0.7804
Time Spent Concerned	Blood Glucose	(F(2,53)=1.370, p>0.2573
Time Spent Concerned	Facial Self-consciousness of appearance	(F((2,52)=0.745, p>0.4797
Time Spent Concerned	BMI	(F(2,53)=1.796, p>0.1759
Time Spent Concerned	sIgA	(F(4,53)=1.706, p>0.1544
Gender	Cortisol	(F(4,54)=0.181, p>0.9478
Age	Cortisol	(F(4,54)=0.181, p>0.9478
General Health	Cortisol	(F(2,55)=1.302, p>0.2761
Stressed during the day	Cortisol	(F(4,54)=1.335, p>0.2617
History of Mental illness	Cortisol	(F(2,55)=0.109, p>0.8966
Preoccupation & Concern	Cortisol	(F(2,53)=0.860, p>0.4261
Concerns & Distress	Cortisol	(F(2,53)=0.311, p>0.7331
Concerns which impair	Cortisol	(F(2,53)=1.232, p>0.2958
Concerns over functioning	Cortisol	(F(2,53)=0.144, p>0.8660
Social Setting Concerns	Cortisol	(F(2,53)=0.225, p>0.7986
Avoidance Concerns	Cortisol	(F(2,53)=1.731, p>0.1821

Time Spent Concerned	Cortisol	(F(4,53)=1.300, p>0.2750
Ethnicity	Cortisol	(F(8,52)=1.757, p>0.0940
All Independent variables	Blood Pressure	p: NS

REFERENCES

Ackerman, J. M, Shaprio, J. R, Neuberg, S. L, Kenrick, D, T, Vaughn Becker, V, Griskevicius, V (2006) They All Look the Same to Me (Unless They're Angry) In Press Psychological Science.

Adams, G, Turner, H, Bucks, R (2005) The experience of body dissatisfaction in men. Body Image 2, pp271-283.

Adkins, E. C, Keel, P. K. (2005) Does "excessive" or "compulsive" best described exercise as a symptom of bulimia nervosa? International Journal of eating disorders, 38, pp24-29.

Allen, E, Seamen, C. (2007) "Likert Scales and Data Analyses". Quality Progress, pp64-65.

Alley, T.R. Cunningham, M.R. (1991) Averaged faces are attractive, but very attractive faces are not average. Psychological Science.Vol 2. pp123-125.

American Obesity Association, The Obesity Society (2009) Obesity Statistics. www.obesity.org . USA.

American Psychiatric Association (1994) Eating Disorders.

American Society for Aesthetic Plastic Surgery (2008) Cosmetic Surgery National Data Bank.

Amorose, A.J. (2001) Intra-individual variability of self-evaluations in the physical domain: Prevalence, consequences, and antecedent. Journal of Sport and Exercise Psychology. Vol 23, pp222-244.

Angeloglou, M. (1970) A History of Make-up. The McMillian Company. London.

Anisman, H, Merali, Z (2002) Cytokines, stress, and depressive illness. Brain, Behavior, and Immunity 16, pp513-524.

Asch, S.E. (1946) Forming impression of personality. Journal of Abnormal and Social Psychology. Volume 41 Issue 3, pp258-290.

Ata, R. N, Ludden, A. B, Lally, M. M (2007) The Effects of Gender and Family, Friend, and Media Influences on Eating Behaviours and Body Image during Adolescence. Journal of Youth and Adolescence 36, (8), pp1024-1037.

Averett, S. L, Sikora, A, Argys, L. M (2008) For better or worse: Relationship status and body mass index. Economics and Human Biology 6, pp330-349.

Baldwin, A. S Jr (1996) The NF-Kappa B and I kappa B proteins: new discoveries and insights. Annu Rev Immunol; 14, pp649-83.

Bamberger, C. M, Schulte, H. M, Chrousos, G. P (1996) Molecular determinants of glucocorticoid receptor function and tissue sensitivity to glucocorticoids. Endocr Rev; 17, pp245-261.

Banerji, M.A, Faridi, N, Atluri, R, Chaiken, R. L. Lebovitz, H. E (1999) Body composition, visceral fat, leptin, and insulin resistance in Asian Indian men. Journal of Clinical Endocrinology and Metabolism 84, pp137-144.

Barber, N (1995) The Evolutionary Psychology of Physical Attractiveness: Sexual Selection and Human Morphology. Ethology and Sociobiology 16, pp395-424.

Barnes, P. J (1998) Anti-inflammatory action of glucocorticoids: molecular mechanisms. Clin Sci (Colch); 94, pp557-572.

Barnes, P. J, Karin, M (1997) Nuclear factor-kappa B- a pivotal transcription factor in chronic inflammatory disease. N Engl J Med; 336, pp1066-1071.

Battle, E. K, Brownell, K.D, (1996) Confronting a rising tide of eating disorders and obesity: Treatment vs prevention and policy. Addictive Behaviours, Vol 21, No6, pp755-765.

BBC News (2007) Newsbeat and TXU Body Image Survey.
http://news.bbc.co.uk/1/hi/health/6376367.stm

Beck, A. T, Ward, C. H, Mendelson, M, Erbaugh, J (1961) An inventory for measuring depression. Arch. Gen Psychiatry. 4, pp561-571.

Benkelfat, C, Ellenbogen, M, Dean, P, Palnour, R, Young, S (1994) Mood-lowering effect of tryptophan depletion. Enhanced susceptibility in young men at genetic risk of major effective disorders. Arch. Gen Psychiatry. 51, pp687-697.

Bergstorm, R. L, Neighbors, C, Lewis, M. A (2004) Do mend find "bony" women attractive?: Consequences of misperceiving opposite sex perceptions of attractive body image. Body Image 1, pp183-191.

Berscheid, E, Dion, K, Walster, G.W. (1971) Physical attractiveness and dating choice: A test of the matching hypothesis. Journal of Experimental Social Psychology, 7, pp173-189.

Bilby, E (1998) The relation between body dysmorphic disorder and depression, self-esteem, somatisation, and obsessive-compulsive disorder. Journal of clinical psychology, 54, pp489-499.

Birkeland, R. J. Thompson, K. Herbozo, S. Roehrig, M. Cafri, G. van den Bergn, M. (2005) Media Exposure, mood, and body image dissatisfaction: an experimental test of person versus product priming. Body Image 2, pp53-61.

Blier, P, De Montigny, C (1994) Current advances and trends in the treatment of depression. Trends Pharmacol Sci. 15, pp220-226.

Blond, A, (2008) Impacts of exposure to images of ideal bodies on male body dissatisfaction: A review. Body Image 5, pp244-250.

Boni, F, (2002) Framing Media Masculinities. British Journal of Communication. Vol 17, No 4, pp465-478.

Brown, P. (2001) Article: A mind under siege. New Scientist

Brownell, K. D. Napolotano, M. A. (1994) Distorting Reality for Children: Body Size Proportions of Barbie and Ken Dolls. International Journal of Eating Disorders. Vol 18, No. 3: pp295-298.

Buss, D M (1989) Sex differences in human mate preference: Evolutionary hypotheses tested in 37 cultures. Behavioural and Brain Science, 12, pp1-49. USA.

Buss, D. M (2007) The Evolution of Human Mating. Acta Pshychologica Sinica 39, 3, pp502-512.

Buss, D. M (2008) Attractive Women Want it All: Good Genes, Economic Investment, Parenting Proclivities, and Emotional Commitment. Evolutionary Psychology, 6 (1), pp134-146.

Cannon, W. (1911) The emergency function of the adrenal medulla in pain and the major emotions. Harvard Medical School.

Cannon, W. (1919) Studies on the conditions of activity in endocrine glands. Harvard Medical School.

Cash, T. F (2005) Our first Body Image birthday: A year in review. Body Image 2, pp1-3.

Cash, T. F, Pruzinsky, T. (2002) Body Image: A handbook of theory, research, and clinical practice. New York. Guilford Press.

Carlyle, T, (1831) Sartor Resartus: the life and opinions of Herr Teufelsdrockh.

Carlyle, T, (1841) On heroes and hero worship and the Heroic in History.

Carroll, D, Ring, C, Shrimpton, J, Evans, P, Willemsen, G, Hucklebridge, F (1996) Secretory immunoglobulin A and cardiovascular responses to acute psychological challenge. Int J Behav. Med 3, pp266-279.

Cash, T. F. (2002a) Beyond traits: Assessing body image states. In T.F. Cach & T. Pruzinsky (Eds.), Body Image: A handbook of theory, research and clinical practice. New York: Guilford Press, pp163-170.

Cash, T. F. (2002b) A "negative body image": Evaluating epidemiological evidence. In T.F. Cach & T. Pruzinsky (Eds.), Body Image: A handbook of theory, research and clinical practice. New York: Guilford Press, pp163-170.

Cash,T. F, Green, G.K. (1986) Body weight and body image among college women: Perception, cognition and affect. Journal of Personality Assessment. 50, pp290-301.

Cash, T. F, Melnyk, S. E, Hrabosky, J. L (2004) The assessment of body image investment: An extensive revision of the Appearance Schemas Inventory. International Journal of eating disorders, 10, pp103-113.

Cash, T. F, Phillips, K. A, Santos, M. T, Hraboshy, J. I (2004) Measuring "negative body image": validation of the Body Image Disturbance Questionnaire in a nonclinical population. Body Image 1, pp363-372.

Cash, T. F, Winstead, B.A, Janda, L.H. (1986) The great American shape-up: Body Image Survey Report. Psychology Today. 20(4), pp30-37.

Cash, T. F, Winstead, B.A, Janda, L.H. (1985) Your body, yourself; A psychology Today reader survey. Psychology Today. 19 (7), pp22-26.

Caspi, A, Sugden, K, Moffitt, T. E, Taylor, A, Craig, I. W, Harrington, H, McClay, J, Mill, J, Martin, J, Braithwaite, A, Poulton, R (2003) Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene. Science, Volume 301, no.5631, pp386-389.

Coffin, T. E. (1955) Televisions impact on society. American Psychologist, Vol 10, Issue 10, pp630-641.

Coleman, J. C. (1980) Friendship and the peer group in adolescence. In J. Adelson (Ed.), Handbook of adolescent psychology. New York. Wiley, pp. 408-431.

Coles, M. E. Phillips, K.A. Menard, W. Pagano, M. E. Fay, C. Weisberg, R. B. Stout, R. L. (2006) Body Dysmorphic Disorder and Social Phobia: Cross sectional and Prospective Data. Depress Anxiety; 23(1), pp26-33.

Coles, M. E, Pinto, A, Mancebo, M. C, Rasmussen, S. A, Eisen, J. L (2008) OCD with comorbid OCPD: a subtype of OCD? Journal of Psychiatric Research.42, pp289-296.

Cororve, M. B, Gleaves, D. H (2001) Body Dysmorphic Disorder: A review of conceptualizations, assessment, and treatment strategies. Clinical Psychology Review, 21, (6) pp949-970.

Campbell, D (2005) 3.6 million people in Britain are gay – official. First Whitehall figure settles long-running debate. Guardian, The Observer.

Cororve, M.B, Gleaves, D.H. (2001) Body Dysmorphic Disorder: A review of conceptualizations, assessment and treatment strategies. Clinical Psychology Review, Vol 21. No 6, pp949-970.

Cowan, G.S, Smalley, M.D, Defibaugh, N, Cowan, K.B, Hiler, M.L, Schnert, W, James, S. (1991) Obesity stereotypes among physicians, medical and college students, bariatric surgery patients and families. Obesity Surgery, 1(2), pp171-176.

Curren, P.J, Stice, E, Chassin, L. (1997) The relation between adolescent and peer alcohol use: A longitudinal random coefficients model. Journal of Consulting and Clinical Psychology, 65, pp130-140.

Dallman, M. J (1992) The cytokine network and regulation of the immune response to organ transplants. Transplantation Reviews, Volume 6 (4), pp209-217.

Darwin, C (1871) The Descent of Man and Selection in Relation to Sex In Two Volumes. John Murray, London.

Davidson, K. K, Markey, C. N, Birch, L. L, (2000) Etiology of body dissatisfaction and weight concerns among 5 year old girls. Appetite, 35, pp143-151.

Delacroix, D. L, Dive, C, Rambaud, J. C, Vaerman, J. P (1982) IgA subclasses in various secretions and in serum. Immunology, Volume 47 (2), pp383-385.

Delahanty, D. L, Dougall, A. L, Hawken, L, Trakowski, J. H, Schmitz, J. B, Jenkins, F. J, Baum, A (1996) Time course of natural killer cell activity and lymphocyte

proliferation in response to two acute stressors in healthy men. Health Psychology 15, pp48-55.

Delgado, P. L, Charney, D. S, Price, L. H, Landis, H, Heninger, G. R (1989) Neuroendocrine and behavioural effects of dietary tryptophan restriction in healthy subjects. Life Sci. 45, pp2323-2332.

Del Rey, A, Besedovsky, H, Sorkin, E (1984) Endogenous blood levels of corticosterone control he immunologic cell mass and B cell activity in mice. J. Immunol. 133, pp572-575.

Demarest, J. Allen, R (2000) Body Image: gender, ethnic, and age differences. J Soc Psychol. 4, pp465-472.

Department of Health, (2004).At least 5 a week. Department of Health, London.

Dhabhar, F. S, McEwen, B. J (1997) Acute stress enhances while chronic stress suppresses immune function "in vivo": a potential role for leukocyte trafficking. Brain Behav. Immun. 11, pp286-306.

Didie, E. R, Kuniega-Pietrzak, T, Phillips, K. A, (2010) Body image in patients with body dysmorphic disorder: Evaluation of and investment in appearance, health/illness and fitness. Body Image 7, pp66-69.

Diedrichs, P. C, Lee, C, Kelly, M (2011) Seeing the beauty in everyday people: A qualitative study of young Australian's opinions on body image, the mass media and models. Body Image 8, pp259-266.

Dion, K. Bersheid, E. Walster, E. (1972) What is beautiful is good. Journal of Personality and Social Psychology. Vol 24, No 3, pp285-290.

Dittmar, H, Halliwell, E, Ive, S (2006) Does Barbie Make Girls Want to Be Thin? The Effect of Experimental Exposure to Images of Dolls on the Body Image of 5-8-Year-Old Girls. Developmental Psychology. Vol 42, Issue 2. pp283-292.

Dittmar, H, Halliwell, E, Stirling, E (2009) Understanding the impact of thin media models and women's body-focused affect: The roles of thin-ideal internalisation and weight-gain self-discrepancy activation in experimental exposure effects. Journal of social and clinical psychology.28, pp43-72.

Drevets, W. C (2001) Neuroimaging and neuropathological studies of depression: implications for the cognitive-emotional features of mood disorders. Current Opinion in Neurobiology, Volume 11, Issue 2, pp240-249.

Durkin, S.J. Paxton, S.J. (2002) Predictors of vulnerability to reduced body image satisfaction and psychological wellbeing in response to exposure to idealized female media images in adolescent girls. Journal of Psychosomatic Research 53, pp995-1005.

Dwivedi, Y, Conley, R. R, Roberts, R. C, Tamminga, C. A, Pandey, G. N (2002) [3H]cAMP Binding Sites and Protein Kinase A Activity in the Prefrontal Cortex of Suicide Victims. Am J Psychiatry, 159, pp66-73.

Ebling, F.J.G (1981) The role of colour in cosmetics, In: Counsell J.N. Editor. Natural colours for food and other uses. London: Applied Sciences Publishers, 1981, pp55-81.

Epstein, J.L. (1989) The selection of friends: Changes across the grades and in different school environments. In T.J. Bernt & G.W. Ladd (EDS.), Peer relationship in child development. New York. Wiley, pp. 158-187.

Etu, S. F, James, J. J, (2010) A preliminary investigation of the relationship between induced rumination and dead body image dissatisfaction and anxiety. Body Image 7, pp82-85.

Evans, P. Bristow, M. Hucklebridge, F. Clow, A. Pang, F, Y (1994) Stress arousal, cortisol and secretory immunoglobulin A in students undergoing assessment. Br J Clinical Psychology, 33, pp575-576.

Evans, P, Clow, A, Hucklebridge, F (1997) Stress and the immune system: current issues and directions in research. The Psychologist 10, pp303-307.

Evans, P, Hucklebridge, F.H, Clow, A, Doyle, A (1995) Secretory Immunoglobulin A as a convenient biomarker in health survey work. In Rodrigues.M. (Ed), Health Psychology and Quality of Life Research. Health Psychology Dept, University of Alicante, Spain, pp541-549.

Faulkner, N. H, Neumark-Sztainer, D, Story, M, Jeffery, R. W, Beuhring, T, Resnick, M. D (2001) Social, educational and psychological correlates of weight status in adolescents. Obesity Research, 9, pp32-42.

Feingold, A, Mazzella, R (1998) Gender differences in body image are increasing. Psychological Science, 9, pp190-195.

Feldman, W, Feldman, E, Goodman, J.T, (1988) Culture vs. biology: children's attitudes toward thinness and fatness. Paediatrics. 81, pp190-194.

Festinger, L. (1954) A theory of social comparison processes. Human Relation. 7(2), pp117-140.

Flament, M. F, Hill, E. M, Buchholz, A, Henderson, K, Tasca, G. (2012) A internalisation of the renowned muscular body ideal and disordered eating in adolescents: The mediation effects of body esteem. Body image 9, pp68-75.

Flannery-Schroeder, E. C, Chrisler, J (1996) Body esteem, eating attitudes, and gender-role orientation in children. Current Psychology.15 (3), pp235-248.

Flegal, K. M, Carroll, M. D, Ogden, C. L, Curtin, L. R, (2010) Prevalence and trends in obesity among US adults, 1999-2008. Journal of the American medical Association, 303, pp235-241.

Fouts, G, Burggraf, K. (2000) Television situation comedies: Female weight, male negative comments, and audience reactions. Sex Roles, 42, pp925-932.

Fukui, Y, Sudo, N, Yu, X, -N, Nukina, H, Sogawa, H, Kubo, C (1997) The resistant stress-induced reduction in lymphocyte cell number in lymphoid organs correlates with suppression of in vivo antibody production. J. Neuroimmunol, 44, pp33-42.

Furnham, A, Calnan, A, (1999) Eating disturbance, self-esteem, reasons for exercising and body weight dissatisfaction in adolescent males. European Eating Disorders Review. 6, pp58-72.

Furnham, A, Petrides, K. V, Constantinides, A (2005) The effects of body mass index and waist-to-hip ratio on ratings of female attractiveness, fecundity, and health. Personality and Individual Differences 38, pp1823-1834.

Gangestad, S. W, Buss, D. M (1993) Pathogen prevalence and human mate preferences. Ethology and Sociobiology, 14, pp89-96.

Gardner, R. M, Friedman, B. N, Jackson, N. A (1999) Body size estimations, body dissatisfaction and ideal size preferences in children six through thirteen. Journal of Youth and Adolescence.28, pp603-618.

Garner, D.M, Garfinkel, P.E, Schwartz, D, Thompson, M (1980) Cultural expectation of thinness in women. Psychological Reports, 47, pp483-491.

Gasperino, J.A, Wang, J, Pierson, R.N, Heymsfield, S.B. (1995) Age-related changes in musculoskeletal mass between Black and White women. Metabolism 44, pp30-34.

Giles, D.C. (2002) Para social interaction: A review of the literature and a model for future research. Media Psychology, Vol 4, pp279-302.

Gondoli, D. M, Corning, A. F, Blodgett Salafia, E. H, Bucchianeri, M. M, Fitzsimmons, E. F, (2011) Heterosocial Goldman, peer pressure the thinness, and body dissatisfaction among young adolescent girls, Body Image 8, pp143-148.

Grant, J.E, Menard, W, Phillips, K.A, (2006) Pathological skin picking in individuals with body dysmorphic disorder. General Hospital Psychiatry. 28, pp487-493.

Groesz, L. M. Levine, M.P. Murnen, S. K. (2001) The Effect of Experimental Presentation of Thin Media Images on Body Satisfaction: A Meta-Analytic Review. Int J Eat Disord 31, pp1-16.

Grogan, S. (2007) Body Image. Understanding Body Dissatisfaction in Men, Women and Children.

Gunstad, J. Phillips, K.A. (2003) Axis I Comorbidity in Body Dysmorphic Disorder. Compr Psychiatry. 44, pp270-276.

Hamilton, W. D, Zuk, M (1982) Heritable true fitness and bright birds: A role of parasites? Science.Vol 218, pp384-387.

Harris, D.L, Carr, A. T, (2001) The Derriford Appearance Scale (DAS 59): a new psychometric scale for the evaluation of patients with disfigurements and aesthetic problems of appearance. British Journal of Plastic Surgery.54, pp226-222.

Harris, D. L, Carr, A. T, Moss, T, (2004) Manual for the Derriford Appearance Scale 59 (DAS 59). Bradford Upon Avon. Musketeer Press.

Harris, D. L. (1982) The symptomatology of abnormal appearance: An anecdotal survey. British Journal of Plastic Surgery. 35, pp312-323.

Harrison, G, Pope, H.G. Phillips, K.A. Olivardia, R. (2000) The Adonis complex: the secret crisis of male body obsession. New York. Free Press.

Heider, F (1958) The psychology of interpersonal relations. New York: John Wiley & Sons.

Heilman, E. E. (1998) The struggle for self: Power and identity in adolescent girls. Youth and Society, Vol 30, pp182-208.

Heinberg, L. J (1996) Theories of body image disturbance: Perceptual, development, and sociocultural factors. In K. Thompson (Ed) Body image, eating disorders, and obesity. American Psychological Association: Washington, DC.

Heinberg, L.J. Thompson, J.K. (1992) Social comparison: Gender, target importance ratings and relation to body image disturbance. Journal of Social Behaviour and Personality. Vol 7, pp 335-344.

Helfert, S, Warschburger, P (2011) A prospective study on the impact of peer and parental pressure on body dissatisfaction in adolescent girls and boys. Body Image 8. (2), pp101-109.

Herbert, T. B, Cohen, S, Marsland, A. L, Bachen, E.A, Rabin, B. S, Moulden, M. E, Manuck, S. B (1994) Cardiovascular reactivity and the course of immune response to an acute psychological stressor. Psychosom.Med. 56, pp337-343.

Herman, J. P, Cullinan, W. E (1997) Neurocircuitry of stress: central control of the hypothalamo-pituitary-adrenocortical axis. Trends Neurosci, 20, pp78-84.

Herrmann, E. Call, J, Hernandez-Lloreda, M.V. Tomassello, M. (2007) Humans Have Evolved Specialized Skills of Social Cognition: The Cultural Intelligence Hypothesis. Science.Vol 317. No 5843, pp1360 – 1366.

Hesse-Biber, S, Leavy, P, Quinn, C. E, Zoino, J (2006) The mass marketing of disordered eating and eating disorders: The social psychology of women, thinness and culture. Women's Studies International Forum 29, pp208-224.

Hesse-Biber, S. N, Carter, G. L (2005) Working women in America: Split dreams. New York. Oxford University Press.

Hill, A.J, Draper, E, Stack, J. (1994) A weight on a children's mind: Body shape dissatisfactions at 9 years old. International Journal of Obesity, 18, pp383-389.

Hill, A. J, Pallin, V (1995) Low self-esteem and weight control: related issues in 8-year old girls but not boys. International Journal of Obesity.18, pp383-389.

Hoek, W. H, Hoeken (2003) Review of the Prevalence and Incidence of Eating Disorders. Wiley Periodicals, Inc.

Houran, J. Navik, S. Zerrusen, K. (2005) Boundary functioning in celebrity worshippers. Personality and Individual Differences 38. pp237-248.

Hucklebridge, F, Clow, A, Evans, P (1998) The relationship between salivary secretory immunoglobulin A and cortisol: neuroendocrine response to awakening and the diurnal cycle. International Journal of Psychophysiology 31, pp69-76.

Hutchinson, D. M, Rapee, R. M (2007) Do friends share similar body image and eating problems? The roles of social networks and peer influences in early adolescence. Behaviour Research and Therapy 45, pp1557-1577.

James, W. P. T, Chen, C, Inoue, S (2002) Appropriate Asian body mass indices? Obesity Review; 3, pp139.

Johansen, F.E, Brandtzaeg, P (2004) Transcriptional Regulation of the mucosal IgA System, Trends in Immunology, Vol 25, No3.

Jones, L. R, Fries, E, Danish, S. J (2007) Gender and ethnic differences in body image and opposite sex figure preferences of rural adolescents. Body image 4, pp103-108.

Kalick, S. M, Zebrowitz, L.A, Langlois, J. H, Johnson, R. M (1998) Does Human Facial Attractiveness Honestly Advertise Health? American Psychological Society. Vol 9, No 1.

Karlson P, Luscher M. 'Pheromones': a new term for a class of biologically active substances. Nature 1959;183, pp55-56.

Keller, S. E, Schleifer, S. J, Liotta, A. S, Bond, R. N, Farhoody, N, Stein, M (1988) Stress-induced alterations of immunity in the hypophysectomised rats. Proceeding of the National Academy of Sciences of the United States of America 85, pp9297-9301.

Kenardy, J, Mensch, M, Bowen, K, Green, B, Walton J, Dalton, M (2001) Disordered eating behaviours in women with Type 2 diabetes. Eating Behaviours, Volume 2, Issue 2, pp183-192.

Keys, A. (1972) Indices of relative weight and obesity. J Chronic Dis. 1 25(6), pp292-243.

Kilbourne, J. (2002) Beauty and the beast of advertising. Center of Media Literacy. CML.

Kimmel, A.J, Tissier-Desborders, E. (1999) Males, masculinity and consumption: An exploratory investigation. European Advances in Consumer research. 4, pp243-251.

Kluck, A. S, (2010) Family influence on disordered eating: The role of body image dissatisfaction. Body Image 7, pp8-14.

Koran, L. M, Abujaoude, E, Large, M. D (2008) The prevalence of body dysmorphic disorder in the United States adult population. CNS Spectrums.13, pp316-322.

Krieger, D.T (1974) Food and water restrictions shifts corticosterone, temperature, activity and brain amine periodicity. Endocrinology 95, pp1195-1201.

Kugler, J, Reintjes, F, Tewes, V, Schedlowski, M (1996) Competition stress in soccer coaches increases salivary immunoglobulin A and salivary cortisol concentrations. J. Sports Med Phys. Fitness 36, pp117-120.

Langlois, J.H. Roggman, L.A. Casey, R.J. Ritter, J.M. Rieser-Danner, L.A. Jenkins, V.Y. (1987) Infant Preferences for Attractive Faces: Rudiments of a Sterotype. Developmental Psychology. Vol 23. No 3, pp363-369.

Langlois, J.H. Roggman, L.A. (1990) Attractive faces are only average. Psychological Science.Vol 1. No 2. pp115-121.

Langlois, J.H., Roggman, L.A., Rieser-Danner, L.A. (1990).Infants' differential social responses to attractive and unattractive faces. Developmental Psychology, 26, pp153-159.

Langlois, J.H., Ritter, J.M., Roggman, L.A., & Vaughn, L.S. (1991).Facial diversity and infant preferences for attractive faces. Developmental Psychology, 27, pp79-84.

Langlois, J. H, Roggman, L, A (1990) Attractive Faces Are Only Average. Psychological Science. Vol1, No2.

Larson, R.W. (1995) Secrets in the bedroom: Adolescents' private use of media. Journal of Youth and Adolescence, Vol 24, pp535-550.

Leit, R. A, Pope, H. G, Gray, J. J, (2001) Cultural expectations of muscularity in men: the revolution of playgirl centrefolds. International Journal of eating disorders, 29, pp90-93.

Lerner, R. M, Korn, S. J (1972) The development of body-build stereotypes in males. Child Development.43, pp908-920.

Levesque, M. J, Vichesky, D. R (2006) Raising the bar on the body beautiful: An analysis of the body image concerns of homosexual men. Body Image 3, pp45-55.

Levine, M.P. Smolak, L. (1998) The mass media and disordered eating: Implications of primary prevention. In G. Van Noordenbos & W. Vandereycken (Eds.), The prevention of eating disorders. London: Atrhlone, pp23-56.

Levine, M. P, Smolak, M. L, Shuman, M. D, Hessen, L. D, (1994) Normative development challenges and dieting and eating disturbance in middle school girls. International Journal of eating disorders, 15, pp11-20.

Low, K. G, Charanasomboon, S, Brown, C, Hiltunen, G, Long, K, Reinhalter, K et al. (2003) Internalisation of the thin ideal, weight and body image concerns. Social Behaviour and Personality, 31, pp81-90.

MacLennan I. C. M, Gray, D (1986) Antigen-driven selection of virgin and memory B cells. Immunol 91; pp61-85.

Maltby, J, Giles, D.C, Barber, L, McCutcheon, L.E. (2005) Intense-personal celebrity worship and body image: Evidence of a link among female adolescents. British Psychological Society. Volume 10, Number 1, pp17-32.

Marano, G, Garfinkel, P. E, Vetrone, G, Cuzzolaro, M (2006) The Body Uneasiness Test (BUT): development and validation of a new body image assessment scale. Eat Weight Disord. 11 (1), pp1-13.

Marcenes, S. W, Sheiham, A. (1992) The relationship between work stress and oral health status. Soc Sci Med, 35, pp1511-1520.

Maret, S. M (1983) Attractiveness ratings of photographs of Blacks by Cruzans and Americans. The Journal of Psychology.115, pp113-116.

Marketon, J. I. W, Glaser, R (2008) Stress hormones and immune function. Cellular Immunology 252, pp16-26.

Matsueda, R.L, Anderson, K (1998) The dynamics of delinquent peers and delinquent behaviour. Criminology, 36, pp269-308.

Matsumoto, S, Kumano, H, Sakano, Y. (1999) Investigation of social influence on eating tendencies and dieting behaviour among female students. Japanese Journal of Behaviour Therapy, 25, (2), pp11-23.

Mazanec, M. B, Nedrud, J. G, Kaetzel, C. S, Lamm, M. E, (1993) A three tiered view of the role in IgA in mucosal defence. Immunology today. Vol 14, Issue 9, pp430-435.

Mayville, S, Katz, R, Gipson, M, Cabral, K (1999) Assessing the prevalence of body dysmorphic disorder in an ethnically diverse group of adolescents. Journal of Child and family studies.8, pp357-362.

McCabe, M. P, Ricciardelli, L. A, (2001) Body image and body change techniques among young adolescent boys. European eating disorders review, 9 (5), pp335-347.

McCreadie, R (2003) Diet, smoking and cardiovascular risk in people with schizophrenia. British Journal of psychiatry, 183, pp534-539.

McCutcheon, L. E. Lange, R. Houran, J. (2002) Conceptualization and measurement of celebrity worship. British Journal of Psychology.Vol 93. No 1, pp67-87.

McCreary, D. R, Sasse, D. K (2000) An exploration of the drive for muscularity in adolescent boys and girls, J Am Coll Health. 48 (6), pp297-204.

Meaney, M. J, Bhatnagar, S, Larocque, S, McCormick, C, Shanks, N, Sharma, S, Smythe, J, Viau, V, Plotsky, P, M (1993) Individual differences in the hypothalamic-pituitary-adrenal stress response and the hypothalamic CRF system. Ann N Y Acad, 679, pp70-85.

Menzel, J. E, Schaefer, L. M, Burke, N. L, Mayhew, L. L, Barnnick, M. T, Thompson, J. K, (2010) Appearance-related teasing, body dissatisfaction, and disordered eating: A meta-analysis. Body Image 7, pp261-270.

Miletic, I. D, Schiffman, S. S, Miletic, V, D. Sattely-Miller, E. A (1996) Salivary IgA secretion rate in young and elderly persons. Physiol. Behav. 60, pp243-248.

Morselli, E (1891) Sulla dismorfofobia e sulla tafefobia: due forme non per anco descritte di Pizzia con idee fisse. Boll R Accad Genova.6, pp110-119.

Mostov, K. E, Transepithelial transport of immunoglobulins. Annu Rev Immunol; 12, pp63-84.

Moynihan, J. A, Karp, J. D, Cohen, N, Cocke, (1994) Alteration in interleukin-4 and antibody production following pheromone exposure: role of Glucocorticoids. J. Neuroimmunol. 54, pp51-58.

Munck, A, Guyre, P. M (1991) Glucocorticoids and immune function. In: Ader, R, Felton, D. L, Cohen, N (Eds), Psychoneuroimmunology. Academic Press, Rochester, pp447-475.

Munck, A, Guyre, P, Holbrook, N Physiological functions of glucocorticoids in stress and their relation to pharmacological actions. Endocr Rev. 5, pp25-44.

Murakumi, J (2002) Gender and Depression: Explaining the Different Rates of Depression Between Men and Women. Perspective in Psychology, pp27-34.

Murray, K. M, Byrne, D. G, Rieger, E (2011) Investigating adolescent stress and body image. Journal of Adolescence 34, pp269-278.

Myers, A. Rosen, J.C. (1999) Obesity stigmatisation and coping: relation to mental health symptoms, body image, and self-esteem. International Journal of Obesity and Related Metabolic Disorders, 23(3), pp221-230.

Najjar, M.F, Rowland, M, (1987) Anthropometric reference data and prevalence of overweight. United States, 1976-80.Vital and Health Statistics. Series 11, No. 238 (DH HS Publication 87, pp1688.

National Health Service (2008) Health Survey for England, 2007, A Survey carried out on behalf of The NHS Information Centre, Joint Health Surveys Unit, National Centre for Social Research, Department of Epidemiology and Public Health, UCL Medical School.

National Health Service (2010) Body Mass Index.
http://www.nhs.uk/Tools/Pages/Healthyweightcalculator.aspx

National Media Museum (2009) The History of Television.
http://www.nationalmediamuseum.org.uk/

Newcomb, T. M (1956) The prediction of interpersonal attraction. American Psychologist, 11, pp575-586.

New York Times (1994, May 27) Billion dollar Barbie. New York Times Magazine, pp22.

Nichter, M. Nichter, M. (1991) Hype and weight. Medical Anthropology, 13, pp249-284.

Norman, G, (2010) “Likert Scales, levels of measurement and the “laws” of statistics”. Advances in Health Science Education. Vol 15 (5), pp625-632.

Nube, M, Asenso-Okyere, W.K, van den Boom, G, J. (1998) Body mass index as indicator of standard of living in developing countries. Eur J Clin Nutr 52, pp136-144.

O’Connor, T. M, O’Halloran, D. J, Shanahan, F (2000) The stress response and the hypothalamic-pituitary-adrenal axis: from molecule to melancholia. Q J Med, Volume 93, pp323-333.

Okamoto, S, Ibaraki, K, Hayashi, S, Saitou, M (1996) Ventromedial hypothalamus suppresses splenic lymphocyte activity through sympathetic innervations. Brain Research 739, pp308-318.

Olson, C. L, Schmaker, H. D, Yawn, B. P (1994) Overweigh Women Delay Medical Care. Arch Fam Med. (3), pp888-892.

Oshima, A, Miyano, H, Yamashita, S, Owashi, T, Suzuki, S, Sakano, Y, Higuchi, T (2001) Psychological, autonomic and neuroendocrine responses to acute stressors in the combined dexamethasone/CRH test: a study in healthy subjects. Journal of Psychiatric Research 35, pp95-104.

Otto, M.W, Wilhelm, S, Cohen, L.S, Harlow, B.L, (2001) Prevalence of Body Dysmorphic Disorder in a Community Sample of Women. Journal of Psychiatry.Vol 158, pp2061-2063.

Oumeish, Y.O (2001) The Cultural and Philosophical Concepts of Cosmetics in Beauty and Art Through The Medical History of Mankind. Clinics in Dermatology. 19, pp375-386.

Oxford Dictionary and Thesaurus (2004) Edited by Sara Hawker. Oxford University Press.

Oxford Dictionary Online (2008) www.oed.com

Pasman, L, Thompson, J. K. (1988) Body image and eating disturbance in obligatory runners, obligatory weightlifters, and sedentary individuals. International Journal of eating disorders, 7, pp759-769.

Pattersen, R.E, Haines, P.S, Popkin, B.M, (1994) Health life-style patterns in the U.S. adults. Prev Med 23; pp453-460.

Paxton, S.J., Schutz, H.K, Wertheim, E.H, Muir, S.L. (1999) Friendship clique and peer influence on body image concerns, dietary restraint, extreme weight-loss behaviours, and binge eating in adolescent girls. Journal of Abnormal Psychology, 108 (2), pp225-226.

Peixoto-Labre, M (2002) Adolescent boys and the muscular male body ideal. Journal of Adolescent Health.30, pp233-242.

Petroff, A. B, Martz, D. M, Webb, R. M, Galloway, A. T, (2011) Predicting ideal body mass index: What does clothing size have to do with it? Body Image 8, pp126-134.

Phillips, K.A. Diaz, S.F. (1997) Gender differences in Body Dysmorphic Disorder. J Nerv Ment Dis, Volume 185 (9), pp570-577.

Phillips, K. A (1991) Body dysmorphic disorder: the distress of imagined ugliness. Am J Psychiatry. 148(9), pp1138-1149.

Phillips, K. A (2002) The obsessive-compulsive spectrums. Psychiatry Clin North Am. 25 (4), pp791-809.

Phillips, K.A. (2005) The broken mirror: Understanding and treating body dysmorphic disorder (revised and expanded edition). New York. Oxford University Press.

Phillips, K.A. Pinto, A. Menard, W. Eisen, J. L. Mancebo, M. Rasmussen, S. A. (2007) Obsessive-Compulsive Disorder versus Body Dysmorphic Disorder: A comparison study of two possibly related disorders. Depress Anxiety. 24(6), pp399-409

Phillips, K. A., Gunderson, C. G., Mallya, G., McElroy, S. L., & Carter, W. (1998b).A comparison study of body dysmorphic disorder and obsessive-compulsive disorder. Journal of Clinical Psychiatry, 59, pp568–575.

Phillips, K. A, McElroy, S. L, Keck, P. E Jr, Hudson, J. L (1993) Body dysmorphic disorder. Am J Psychiatry.150 (2), pp302-308.

Plotsky, P. M, Vale, W. W (1984) Effects of paraventricular lesions on corticotropin-releasing factor (CRF)-like immunoreactivity in the stalk-median eminence: studies on the adrenocorticotropin response to ether stress and exogenous CRF. Endocrinology, 114, pp57-62.

Pope, H, Phillips, K.A., Olivardia, R (2000) The Adonis complex: the secret crisis of male body obsession.

Prussner, J. C, Wolf, O. T, Hellhammer, D. H (1997) Free cortisol levels after awakening. J Psychophysiol, 9, pp365.

Randall, D.C (2004) Discovering the role of the adrenal gland in the control of body function. American Physiological Society.

Reese, V (1995) Dermatology in the cinema. J Am Acad Dermatol. 33, pp1030-1034.

Ricciardelli, L. A, McCabe, M. P, Banfield, S, (2000) Body image and body change methods in adolescent boys: Role of parents, friends and the media. Journal of the psychosomatic research, Volume 49, Issue 3, pp189-197.

Rief, W. Buhlmann, U. Wilhelm, S. Borkenhagen, A. Brahler, E. (2006) The prevalence of body dysmorphic disorder: a population-based survey. Psychological Medicine. Vol 36, 6, pp877-885.

Rolland, K, Farnhill, D, Grriffiths, R. A (1996) Children's perceptions of their current and ideal body sizes and body mass index. Perceptual and Motor Skills. Volume 82, pp651-656.

Rosen, J.C. (1990) Body Image and eating disorders. In T.F. Cash &T. Pruzinsky (Eds.), Body Image; Development, deviance and change. New York. The Guilford Press, pp190-214.

Rosen, J.C. Reiter, J. (1996) Development of the Body Dysmorphic Disorder Examination. Behav. Res. Ther. Vol.34. No.9, pp755-766.

Rosen, J.C. (1996) Body dysmorphic disorder: assessment and treatment. In: J.K. Thompson (Ed.) Body image, eating disorders, and obesity. Washington, DC: American Psychological Association, pp149-170.

Roy, M, Gauvin, L (2009) Casting weight goal as a function of weight status among a representative population-based sample of adolescents. Body Image 6, pp277-284.

Roy, M, Le´vy, E, & Alvarez, F. (2010). Diffe´rentes e´poques et civilisations, diffe´rents rapports au corps et a` l'alimentation: Lorsque la modernite´ devient productrice d'obe´site´. In M. Roy, F. Alvarez, & E. Le´vy (Eds.), Pe´diatrie et obe´site´: Un conflit entre nature et culture? Montre´al: E´ditions de l'Hoˆpital Sainte-Justine. (in French), pp25-32.

Roy, M, Payette, H. (2012) The body image construct among Western seniors: A systematic review of the literature. Archives of Gerontology and Geriatrics.

Rudiger, J. A, Cash, T. F, Roehrig, M, Thompson, J. K, (2007) Day-to-day body-image states: Prospective predictors of intra-individual level and variability. Body Image 4, pp1-9.

Sachar, E.J, Hellman, L, Roffwarg, H.P, Halpern, F. S, Fukushima, D. K, Gallagher, T. F (1973) Disrupted 24-hour patterns of cortisol secretion in psychotic depression. Arch. Gen. Psychiatry. 28, pp19-24.

Sachdev, P, Mondraty, N, Wen, W, Gulliford, K (2008) Brains of anorexia nervosa patients process self-images differently from non-self-images: an fMRI study. Neuropsychologia.46 (8), pp2161-2168.

Sapolsky, R, M (1992) Stress, the Aging Brain, and the Mechanisms of Neuron Death. MIT Press.

Sapolsky, R. M, Krey, L. C, McEwen, B. S (1984) Stress down-regulates glucocorticoids receptors in a site-specific manner in the brain. Endocrinology, 144, pp287-292.

Sarwer, D.B. Crerand, C.E. (2008) Body Dysmorphic Disorder. Body Image. 167.

Sarwer, D. B, Grossbart, T. A, Didie, E. R (2003) Beauty and Society. Seminars in Cutaneous Medicine and Surgery. Vol 22, No 2, pp79-82.

Schaller, I (1963) The Mountain Gorilla: Ecology and Behaviour, Chicago: University of Chicago Press.

Shatzberg, A. F, Schildkraut, J. J (1995) Recent Studies on Norepinephrine Systems in Mood Disorders. Neuropsychopharmacology: The Fifth Generation of Progress.

Schilder, (1935) The image and appearance of the human body. London. Kegan Pulan, Trency, Trubner.

Senba, E, Ueyama, T (1997) Stress-induced expression of immediate early genes in the brain and peripheral organs of the rat. Neurosci Res, 29, pp183-207.

Seeger, G, Braus, F. D, Ruf, M, Goldberger, U, Schmidt, M.H. (2002) Body image distortion reveals amygdale activation in patients with anorexia nervosa – a functional magnetic resonance imaging study. Neuroscience Letters, Vol 326, pp25-28.

Selye, H. (1978) The Stress of Life. McGraw-Hill. New York.

Silberman, D. M, Wald, M, Genaro, A. M (2002) Effects of chronic mild stress on lymphocyte proliferative response. Participation of serum thyroid hormones and corticosterone. Int Immunopharmacol. 2, pp487-497.

Singh, D.J. (1993) Pers. Soc, Psychol. Vol 65. pp293-307.

Singh, D.J. (1995). Human Nature, Vol 6. pp51-68.

Slade, P.D. (1994) What is body image? Behaviour Research and Therapy. Vol 5, pp497-502.

Spasojevic, J, Alloy, L. B, Abramson, L. Y, Maccoon, D, Robinson, M (2004) Reactive rumination: outcomes, mechanisms, and developmental antecedents. In C. Papa-georgiou & A. Wells (Eds), Depressive rumination: nature, area and treatment. West Sussex, England: John Wiley & Sons Ltd, pp43-58.

Spitzer, B.L, Henderson, K.A. Zivian, M.T, (1999) Gender differences in population versus media body sizes: A comparison over four decades. Sex Roles, 40, pp545-565.

Stanford, J. N, McCabe, M. P (2005) Sociocultural influences on adolescent boys' body image and body change strategies. Body Image, 2, pp105-113.

Stice, E, Schupak-Neuberg, E, Shaw, H.E, Stein, R.I, (1994) Relation of media exposure to eating disorder symptomatology: An examination of mediation mechanisms. Journal of Abnormal Psychology, 103, pp836-840.

Strahan, E. J, Wilson, A. E, Cressman, K. E, Buote, V. M, (2006) Comparing to perfection: how cultural norms for appearance affect social comparisons and self-image, Body Image 3, pp211-227

Symons, D (1979) The Evolution of Human Sexuality. Oxford Press.

Tapper, J. Morris, D. (2005) Celebrity Media Spinning Out of Control. ABC News. http://abcnews.go.com/Nightline/Entertainment/story?id=528898&page=1

The British Association of Aesthetic Plastic Surgeons (2010) Plastic Surgery Statistics.www.baaps.org.uk.

Thompson, J. K, Heinberg, L. J, Altabe, M, Tantleff-Dunn, S (1999) Exacting beauty. Washington, DC, American Psychological Association.

Thompson, J. K, Shroff, H, Herbozo, S, Cafri, G, Rodriguez, J, Rodriguez, M, (2007) Relations among multiple peer influences, body dissatisfaction, eating disturbance, and self-esteem: A comparison of average weight, at risk of overweight, and overweight adolescent girls. Journal of paediatric psychology, 32, pp24-29.

Thorndike, E.L. (1920) A constant error in psychological ratings. Journal of Applied Psychology 4, pp469-477.

Tiggerman, M, McGill, B (2004) The role of Social Comparison in the Effect of Magazine Advertisements on Women's Mood and Body Dissatisfaction. Journal of Social and Clinical Psychology, Vol 23, No 1, pp23-44.

Tolson, J.M, Urberg, K.A. (1993) Similarity between adolescent best friends. Journal of Adolescent Research, 8 (3), pp274-288.

University of Bradford (2008/2009) Facts & Figures – Staff Statistics. http://www.brad.ac.uk/mediacentre/university-in-profile/facts-and-figures/staff-statistics/

University of Bradford (2008/2009) Facts & Figures – Student Statistics. http://www.brad.ac.uk/mediacentre/university-in-profile/facts-and-figures/student-statistics.

Van Praag, H. M (2004) Can stress cause depression. Progress in Neuropsychopharmacology & Biological Psychiatry.28, pp891-907.

Vitkovic, L, Konsman, Brockaert, J, Dantzer, R, Homburger, Jacque, C (2000) Cytokine signals propagate through the brain. Molecular Psychiatry, 5, pp604-615.

Vygotsky, L.S. (1978). Mind and society: The development of higher mental processes. Cambridge, MA: Harvard University Press.

Walsh, B.T, Delvin, M.J. (1995) Eating disorders. Child & Adolescent Psychiatry Clinics of North America, Vol 4, pp343-357.

Wan, W. Vriend, C. Y, Wetmore, L, Gartner, J. G, Greenberg, A. H, Nance, D. M (1993) The effects of stress on splenic immune function are mediated by the splenic nerve. Brain Research Bulletin, 30, pp101-105.

Wang, J. Thornton, J, C. Russell, M. Burastero, S. Heymsfield, S. Pierson, R. N. (1994) Asians have lower body mass index (BMI) but higher percent body fat that do whites: comparisons of anthropometric measurements. American Journal of Clinical Nutrition 60, pp23-28.

Weisfeld, G.E, Weisfeld, C. C, Callaghan, J. W (1984) Peer and self perceptions in Hopi and Afro-American third and sixth graders. Ethos, 12, pp64-83.

Wilckens, T, De Rijk, R (1997) Glucocorticoids and immune function: unknown dimensions and new frontiers. Immunol. Today 18, pp418-424.

Willemsen, G, Ring, C, Evans, P, Clow, A, Hucklebridge, F, Carroll, D (1998) Secretory immunoglobulin A and cardiovascular reactions to mental arithmetic and cold pressor. Psychophysiology, 35, pp252-259.

Willemsen, G, Carroll, D, Ring, C, Drayson, M (2002) Cellular and muscosal immune reactions to mental and cold stress: associations with gender and cardiovascular reactivity. Psychophysiology 39, pp222-228.

Willhelm, S. Otto, M. W. Zucker, B. G. Pollack, M. H. (1997) Prevalence of Body Dysmorphic Disorder in patients with anxiety disorders. J Anxiety Disord. 11, pp499-502.

Williams, B, Poulter, N. R, Brown, M. J, Davis, M, McInnes, G.T, Potter, J.F, Sever, P. S, Thom, S.M. (2004) BHS guidelines for hypertension management. British Medical Journal. 328(7440), pp634-640.

WHO/IASO/IOTF (2000) The Asia-Pacific perspective: redefining obesity and its treatment. Health Communications Australia: Melbourne.

WHO (2000) Obesity: preventing and managing the global epidemic. Report of a WHO Consultation. WHO Technical Report Series 894. Geneva. World Health Organisation.

WHO expert consultation. (2004) Appropriate body mass index for Asian population and its implications for policy and intervention strategies. The Lancet, pp157-163.

World Health Organisation, 2003. Global strategy on diet, physical activity and health. WHO, Geneva.

Yates, A, Edman, J, Aruguete, M (2004) Ethnic Differences in BMI and Body/Self-Dissatisfaction Among Whites, Asian Subgroups, Pacific Islanders, and African-Americans. Journal of Adolescent Health; 34, pp300-307.

Young, S, Smith, S, Pihl, R, Ervin F (1985) Tryptophan depletion cases a rapid lowering of mood in normal males. Psychopharmacology (Berl.) 83, pp173-177.

Young, E. A, Lopez, J. F, Murphy-Weinberg, V, Watson, S. J, Akil, H (2000) Hormonal evidence for altered responsiveness to social stress in major depression. Neuropsychopharmacology.23, pp411-418.

Yu, D. W, Shepard, G.H. (1998) Is beauty in the eye of the beholder? Nature. Vol 396, pp321-322.

Zebrowitz, L. A, Montepare, J, M, Lee, H, K (1992) They Don't All Look Alike: Individuated Impressions of Other Racial Groups. Journal of Personality and Social Psychology, 65, 1, pp85-101.

Zeier, H. Brauchli, P. Joller-Jemilka, H. I. (1996) Effects of work on immunoglobulin A and cortisol in air traffic controllers. Biol. Psychol 42, pp413-423.

Zhang, D, Kishihara, K, Wang, B, Mizobe, K, Kubo, C, Nomoto, K (1998) Restraint stress-induced immunosuppression by inhibiting leukocyte migration and Th 1 cytokine expression during intraperitoneal infection of Listeria monocytogenes. J. Neuroimmunol, 92, pp139-151.