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**A comparison of cognitive interference
in restrained and unrestrained eaters
using a modified Stroop task.**

A thesis presented in partial fulfilment
of the requirements for the degree of Master of Arts in Psychology
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ABSTRACT

Cognitive factors are thought to play a primary role in the etiology and maintenance of eating disorders. Self-report measures used to assess people with eating disorders are prone to demand characteristics due to the secrecy and denial that are that are symptomatic of eating disorders. One measure with content which is difficult to fabricate is the Stroop test. The Stroop test is a colour naming task that involves a cognitive interference effect thought to occur when the words to be colour named are emotionally relevant to the subjects' concerns or worries. All studies assessing cognitive interference with a Stroop task among eating disordered populations have reported that such subjects have delayed response times to food, weight and shape words when compared to control subjects without eating disorders, and when compared to Stroop tasks using neutral stimuli. Women who continually attempt to restrict their food intake in order to conform to cultural ideals of physical beauty may become restrained eaters. There is some evidence that suggests restrained eaters also show cognitive interference on food, weight, and shape Stroop tasks. Anxiety and depression are common symptoms among individuals with eating disorders but little is known about the relative strength of these symptoms in restrained and unrestrained eaters. It is plausible that people with eating disorders, restrained and unrestrained eaters may fall along a continuum in relation to eating related pathologies such as interference on food, weight, and shape Stroop tasks, and anxiety and depression. In the present study the performance of female restrained ($n = 21$) and unrestrained eaters ($n = 34$) were compared on two Stroop tasks, one involving food, weight, and shape words and the other involving anxiety words. They were also compared on measures of trait anxiety and depression. Contrary to expectations no group differences were found on any of these measures. The lack of significant group effects was potentially explained by very low levels of eating related symptomatology and trait anxiety in the restrained eaters group compared to control and normative comparison groups. These results suggested that the process of subject recruitment in obtaining volunteers to complete the Stroop tasks may have produced artifacts. Possible causes for the inconclusive results are discussed and recommendations for future research proposed.

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INTRODUCTION

Bulimia Nervosa (BN), is an eating disorder which effects approximately 4% of university and high school women, and 3% of community based samples (Wells, Bushnell, Hornblow, Joyce & Oakley-Browne, 1989). It is characterised by normal weight individuals (70% of bulimics are within the normal weight range, with 15% overweight and 15% underweight (DeZwann & Mitchell, 1991)) who habitually engage in food binges (Bulik, 1994; Wilson, 1989). These binges are followed by efforts to eliminate or purge the consumed food, most commonly by self-induced vomiting and/or the abuse of laxatives and diuretics (Bulik, 1994).

Cognitive factors are thought to play a primary role in the etiology and maintenance of BN. Abnormal attitudes and beliefs about weight regulation and the evaluation of self-worth around body shape and weight, possibly cause preoccupation with dieting and rigid unrealistic cognitions about eating and weight control (Wilson, Rossiter, Kleifield & Lindholm, 1986). Because cognitive beliefs and values appear to be of primary importance in the maintenance of the bulimic condition, it is likely that change in this specific psychopathology is a prerequisite for full recovery (Fairburn, 1984). Due to the secretive nature of this disorder (that is, covert consumption of bingeing food, sneaking away to vomit after meals or to 'pop' laxative pills), the propensity to deceive others about preoccupation with food and weight control is high. This can be accentuated by the shame and guilt people with eating disorders experience because of their 'out of control' eating habits. This secretiveness can extend to lying about treatment progress in counselling, when in reality dysfunctional behaviour is still occurring. Self-report questionnaires which assess the pathology present in individuals with BN have limitations in terms of reliability, validity and accuracy due to the shame and denial of bulimic symptoms (Walker, Ben-Tovim, Jones & Bachok, 1992). Also the demand effects of self-report questionnaires encourage individuals to give socially desirable answers (Cooper, Anastasiades & Fairburn, 1992). Coupled with the tendency of people with bulimia to deny their illness, these factors may lead to distortion of responses to self-report questionnaires (Ben-Tovim, Walker, Fok & Yap, 1989).

A possible method of counteracting inaccurate self-report is the use of brief objective measures which provide information about cognitive disturbances, yet whose content is extremely difficult to fabricate. An example of such a measure is the Stroop colour naming task (Stroop, 1935).

The Stroop Test

The original Stroop colour naming task involved subjects naming the colour in which colour words were written, while ignoring the word meaning itself. If the ink colour matches the meaning of the word (for example, the word red printed in red ink) then the colour naming task is quickly completed. However, if the ink colour and the word meaning do not match (for example, the word red printed in green ink) then the task takes longer. This delay in responding has become known as the “Stroop effect” and has been replicated many times, is robust and universal (MacLeod, 1991). It is thought that the Stroop effect occurs because the internal representations of both word meaning and word colour are accessed and that word meaning interferes naming the word colour (Mathews & Klug, 1993). MacLeod (1991) outlines strong evidence which indicates that the interference occurs because reading words is much more practised than naming the colours, therefore the word meaning is accessed more easily and therefore faster than the colour name. However, there is little agreement whether interference occurs because of conflict at the input attention stage of processing, at the output, or somewhere in the middle (Mathews & Klug, 1993).

In the characteristic Stroop experiment subjects identify or name colours of lists of words as fast as they can. There are typically three cards comprised of independent lists of words: one conflicting-colour card (subjects name the ink colour of the words, but the words are the names of colours that conflict with the colour of the ink in which they are printed), one target card (containing the words of interest to the experiment), and one control card to assess the impact of the target card. Usually five colours are used in ink and name, plus five words each for the control and target lists. The difference in the speed with which colours are named between the two cards is used to imply interference. For example, the time taken to colour name words on the target card minus the time taken to colour name words on the control card, is one type of interference.

It has been found that interference with colour naming appears to occur whenever cognitive representations of the words to be colour named are activated (Mathews & MacLeod, 1985). It has been proposed that the relationship between affect and cognition involves a bias towards the processing of emotional material among subject populations for whom this material is clinically significant (MacLeod, Mathews & Tata, 1986). For example, Mathews and MacLeod found generally anxious subjects to be slower than controls on a modified Stroop task involving the colour naming of threat related words. Mattia, Heimberg and Hope (1993) found similar results when comparing social phobics to controls on a Stroop task using socially threatening words. Similar colour naming interference patterns using clinically significant material has also been found for people who are depressed (Gotlib & McCann, 1984).

The Stroop effect in relation to cognitive interference amongst individuals with eating disorders

The Stroop measure can be modified to assess the pathology of thought processes involving food, shape and weight words in eating disordered individuals. All studies assessing cognitive interference in people with eating disorders have reported that anorexic and/or bulimic individuals manifest delayed response times to food, weight and shape related word sets relative to normal subjects and relative to their own response times when neutral stimuli are presented (Ben-Tovim, Walker, Fok & Yap, 1989; Ben-Tovim & Walker, 1991; Channon, Hemsley & deSilva, 1988; Cooper, Anastasiades & Fairburn, 1992; Fairburn, Cooper, Cooper, McKenna & Anastasiades, 1991). However, Ben-Tovim et al (1989) and Channon et al (1988) neglected to include all three crucial areas of interest, that is eating, weight and shape. The former study only investigated food and body-shape words, and the latter study looked only at food and body size. Fairburn et al (1991) used food, weight and shape words and found that bulimics were slower than female controls in colour naming these words within the modified Stroop task. It was proposed by Fairburn et al that this suggested selective processing of eating, weight, and shape related words but only in those individuals with an eating disorder of clinical severity.

The relationship of dieting to the development of eating disorders

In Western countries there is an intense pressure on women to diet in order to conform to an unrealistic standard for feminine beauty (Garner, Rockert, Olmsted, Johnson & Coscina,

1985). The media conveys messages that, in order to be beautiful, successful, have self-worth and to gain esteem, women must have a very slender build. In past, influenced by these pressures, many women at some stage in their life have been on a diet.

A study in New Zealand by Fear (1993) found that by age 15, 54% of fourth form girls had dieted in an effort to loose weight, 38% reported having eating binges, and 12% reported using vomiting for weight loss purposes. These findings are consistent with British and American studies which indicate that women in general have internalised the western cultural values concerning being thin (thinness being associated with positive and desirable societal values) and that the ideal female body is significantly below what is healthy, average and/or normal for women in western society (McCarthy, 1990). Integrated into the dieting culture is the tendency of people to measure their self esteem and self attributes in terms of how much weight they have lost or gained. For example, a weight loss of several pounds can induce a positive and elated mood state and self esteem in an individual whereas the opposite, that is, weight gain generally induces negative affects and reduced self esteem (Bulik, 1994). This weight-mood mentality is a common finding in dieters and bulimics.

Another phenomenon concerning attribution is that when people go on a diet and they lose weight they attribute this positive feedback to the diet or the dieting organisation to which they belong, however, if this diet does not work or weight is regained the individual blames themselves for the apparent failure. Given the high frequency with which people regain the weight they have lost on diets (Bulik, 1994), chronic dieting is often associated with failure and decreased self-esteem. While it is clear that not all people who go on a diet develop an eating disorder (Patton, 1988), those who continually restrict food intake may develop similar thought patterns and biased information processing as people with eating disorders, but without developing the symptomology (Perpiñá, Hemsley, Treasure & deSilva, 1993). For example, a person who is chronically concerned about their weight may have similar dysfunctional attitudes and thoughts towards food when compared to an individual with an eating disorder.

Dieting usually involves the restriction of food intake, particularly those foods which are perceived as fattening such as cheese, butter, milk, chocolate and biscuits. This restriction and attempts to lower the body's set point, (the body's physiologically programmed weight

level which is determined by genetic and body size factors), prepares the human body for starvation and encourages overeating when the diet is broken (Wilson, 1989). The more intense or drastic the dieting, the greater the potential for ravenous over-consumption if the cognitive controls begin to break down (Garner et al, 1985).

The Minnesota semi-starvation experiment provided evidence of these patterns (Keys, Brozek, Henschel, Mickelson & Taylor, 1950). This landmark study conducted over thirty years ago systematically deprived 36 young, psychologically normal men of adequate calorie intake so they went into a state of semi-starvation. This was conducted over a six month period with the participants losing on average 25% of their original body weight. Prior to the starvation period the men were given a diet which maintained their normal weight for a 3 month period. After the starvation period there was a 3 month rehabilitation during which the participants food and calorie intake was increased gradually so that they retained their pre-experimental weight. During all three stages of the experiment the participants' behaviour, personality characteristics and eating patterns were carefully noted down and studied in detail. The study found that the participants attitudes and behaviour related to food changed dramatically during the starvation phase with the men predictably becoming obsessed by food and eating. The content of thoughts, conversation, reading and daydreams tended to be strongly dominated by food and a lot of the men came up with ingenious methods to prolong the time taken to eat their meagre meals and to increase the saliency of food. All of the participants experienced increased hunger with mixed tolerance levels. Some instances of bulimia were reported among the participants who found the hunger intolerable and therefore binged but they found the loss of control an overpowering emotional experience and induced vomiting. For example, one subject who worked in a grocery store, "suffered a complete loss of will power and ate several cookies, a sack of popcorn, and two overripe bananas before he could 'regain control' of himself. He immediately suffered a severe emotional upset, with nausea, and upon returning to the laboratory he vomited....He was self-deprecatory, expressing disgust and self-criticism", (Keys et al, 1950, p. 887).

The point of satiation was lost for some of the men so that during the rehabilitation stage they were eating very large amounts of food at one sitting and eating again soon (for example, 30 minutes) after meals. Weekend splurges or binges of between 8,000 and

10,000 calories were common and stopping from eating was found difficult. Although most of these behaviours had ceased at the end of rehabilitation a few men were still eating abnormally large amounts of food.

Although the subjects of the starvation experiment were carefully screened using psychometric tests and lengthy interviews to exclude individuals who may be or become mentally unstable during the experiment, all of the men experienced affective changes. Decreased threshold levels for anxiety, irritability, anger and depression were reported. Mania was also observed in several of the subjects but this was usually followed by a period of depression. Abuse of caffeine and nicotine was common even among those men who did not smoke or drink tea and coffee before the experiment. A standardised personality test (MMPI) was routinely administered to the participants and this revealed increased depression, hysteria and hypochondriasis which persisted several weeks into the rehabilitation period. None of the subjects suffered from reduced intellectual abilities due to the starvation, however, they reported feeling less alert and that their concentration, judgement and analytical skills had become retarded due to lack of food. The starvation period also effected how these men interacted with others and their sexual urges. They became withdrawn and humourless, seeking social isolation and their sexual interest and thoughts decreased markedly or else completely disappeared.

Physical changes became apparent as the starvation period progressed with hair loss, decreased need for sleep, decreased tolerance for cold in the extremities, headaches and dizziness. The participants showed decreased body temperature, heart rate, respiration and basal metabolic rate (BMR; the amount of energy at rest required by the body to carry out normal physiological processes such as organ functioning, cell regeneration and digestion). This study illustrated the human body's capacity to regulate the energy it burns in relation to the energy that is put into it. A 40% drop of BMR was experienced by the men at the end of the starvation phase but once they started eating larger amounts in the rehabilitation phase their BMR speeded up with the men who had the largest energy intake showing the greatest increase. Another interesting finding was that the ratio of body fat to muscle changed significantly from pre-starvation to post-starvation phases. For example, during starvation weight dropped about 25% with a decrease of 70% in body fat and a decrease of 40% in muscle mass but at the post-starvation stage the subjects were approximately 110% of their

original body weight and 140% of their original body fat. However, 12 months after the starvation period most men had returned to their pre-starvation weight and fat/muscle ratio.

This experiment is important because although there was large variance in responses among the men in relation to the semi-starvation experiment some insight was gained into why eating disordered individuals behave like they do and why people who oscillate between crash dieting and normal eating often put the weight they lost back on. The more frequently an individual diets the more quickly and efficiently the body adapts and regulates the BMR to burn less energy (Garner et al, 1985). It also provides strong evidence of each individual having a natural set point weight which is resistant to change so that people are naturally lean or heavy and efforts to lose weight is met with resistance with the body changing its BMR to maintain the optimum or set point weight.

The set point phenomenon has also been demonstrated in an experiment where volunteers were required to gain 20-25% of their original body weight over six months (Sims, Goldman, Gluck, Horton, Kelleher & Rowe, 1968). Most men gained the initial couple of pounds easily but found it increasingly difficult to gain more weight despite a huge daily intake of calories. It appeared their metabolism speeded up to burn the extra fuel they were putting into their bodies and this was evidenced by increased perspiring and body heat. At the end of the experiment most of the men lost weight rapidly and stabilised at their pre-experimental weight. Interestingly two men who gained the weight rapidly and two men who had a history of obesity and diabetes found it difficult to return to their original weight. The set point theory of weight challenges the predominant view of obesity being a pathology and under the control of the individual, that is the lay persons view that over weight people just need to watch what they eat, show self control and will power. It is possible that people who are naturally heavy but reduce their weight by eating less and exercising more may be biologically starving themselves. It would be expected that psychologically such people would experience starvation induced pathologies similar to those experienced by the subjects in the Minnesota semi-starvation experiment. For example, increased anxiety, depression and irritability. This suggests that eating disordered people, people who chronically diet and people who do not attempt to regulate what they eat could be on a continuum in relation to starvation induced symptoms such as increases in anxiety, anger, irritability and depression.

Restrained eaters and cognitive interference

There is strong evidence that binge eating may be caused by dieting restraint and suppression of body weight even in those who are obese (Garner et al, 1985). The self-control of restrained eaters concerning food is often tenuous with any number of cognitive, behavioural and situation disinhibitors capable of inducing a binge (Strauss, Doyle & Kreipe, 1994). For example, strong emotional states such as depression, rigid cognitions concerning attitudes towards food, dieting and bingeing, the actual dieting behaviour resulting in skipping meals and unrealistic food intake at meals, and situations where the individual is hungry and surrounded by appetising food such as at a Christmas dinner (Ruderman, 1986). The restrained eating model which pairs disinhibitors with food restriction as causing bingeing behaviours is very similar to the bulimics starve/ binge/ purge eating patterns, with many of the same disinhibiting factors implicated in initiating binges among bulimics (Johnson, Connors & Tobin, 1987). Therefore it is plausible that people who refrain from dieting, restrained eaters, and people showing pathology of an eating disorder are on a continuum. Thus, restrained eaters would exhibit lower levels of cognitive bias than eating disordered individuals towards eating-, weight-, and shape-related words.

Laessle, Tuschl, Waadt, and Pirke (1989) compared bulimics, restrained and unrestrained eaters on measures related to dieting, cognitive and behavioural aspects of dieting, physical appearance and depression. They found that restrained eaters differed significantly from unrestrained eaters and differed significantly from the bulimic participants on levels of pathology (for example, depression and bulimia). Studies comparing restrained eaters to eating disordered individuals have produced conflicting results.

Perpiñá, Hemsley, Treasure and deSilva (1993) found that high restraint, when compared to low restraint and control words, was associated with slower processing of food and body-related terms using modified Stroop tasks. Wilson (1989) found that bulimics and restrained eaters were significantly slower on the Stroop task than unrestrained eaters but the bulimics and restrained eaters were not significantly different from each other on the same task. Cooper and Fairburn (1992) compared dieters to subjects with eating disorders and found that dieters who reported a history of symptoms of an eating disorder as well as the patients with anorexia nervosa and bulimia showed selective processing of information related to eating, weight and shape. Normal dieters and non-dieting normal controls in this study did

not show such selective processing. Mahamedi and Heatherton (1993) compared restrained and unrestrained eaters, and found that there was no significant difference in terms of interference between these two groups on a Stroop task using separate groups of food and body-size words. However, when half of the restrained and unrestrained eaters were given a preload (a 'diet-breaking' 15-oz chocolate milkshake) before completion of the Stroop task both groups experienced more interference on the body-size words than those who had not had the preload, but this result was most significant for the restrained eaters. No such interference effects were present for the food words. It was thought that these results indicated that high calorie preload effected the thought processes of restrained and unrestrained eaters and that it activated body shape concerns (Mahamedi & Heatherton, 1992). Green and Rogers (1993) compared restrained and unrestrained eaters and found that high restraint was associated with significant latencies on body and shape words when compared to control words and low to medium restrained eaters.

Thus, three studies found comparatively similar results in that restraint was associated with significantly longer latencies on food, body and shape words when compared to controls (Perpiñá et al, 1993; Wilson, 1989; Green & Rogers, 1993). However, two studies suggest that the relationship between restrained eating and longer latencies on modified Stroop cards compared to control subjects may be more complex and involve other variables such as history of an eating disorder and the effects of eating food directly before completion of the Stroop task (Cooper & Fairburn, 1992; Mahamedi & Heatherton, 1993).

Methodological considerations for Stroop task studies comparing subjects with eating disorders and restrained eaters

A number of methodological flaws limit the usefulness of prior studies which have used a modified Stroop task to compare restrained and unrestrained eaters. The study by Perpiñá et al (1993) lacked adequate group sizes (the control restrained group contained $n = 9$ subjects and the control unrestrained group contained $n = 23$), and included eating disordered subjects in the restrained eating group.

A another methodological concern related to differences in definition of "restrained eaters" versus "dieters". Cooper and Fairburn (1992) used the concept of dieting as a criteria with a four week stand down period, that is dieters were classified as such if they had been on a

diet for at least four weeks and non-dieters if they had not been on a diet for four weeks. Whereas, typically restrained eating has been assessed via the Restraint Scale (Herman & Polivy, 1980), which intends to measure the extent to which people display overconcern with their weight and chronically diet to control it (Heatherton, Herman, Polivy, King & McGree, 1988). Instead of referring to a single behavioural tendency (such as the term “dieting” suggests), restraint is a multifaceted syndrome involving both a propensity to restrict food intake as well as a tendency to binge and to display a pattern of weight loss and gain (Heatherton et al, 1988). Although restrained eaters and dieters are comparable concepts, restrained eating is more consistently operationally defined by using the standardised self-report measure named the Restraint Scale which has favourable psychometric properties (Heatherton, Herman, Polivy, King & McGree, 1988; Herman & Mack, 1975; Laessle, Tuschl, Kotthaus & Pirke, 1989). Dieting per se does not supply sufficiently specific information because peoples’ motivations for going on a diet are not homogeneous. For example, a jockey who diets for a big race so their horse will go faster is not comparable to a young person who diets so they will be more socially desirable.

In order to address these methodological concerns, the present study defined restrained eaters using the Restraint Scale and attempted to obtain sufficiently large sample sizes of restrained and unrestrained eaters in an attempt to provide stable and reliable results.

Anxiety and it's relationship to eating disorders

For the purposes of this study very brief descriptions of state/trait anxiety, generalised anxiety disorder and social phobia will be given. Brief definitions of generalised anxiety disorder and social phobia are given as these disorders are common amongst eating disordered populations (Bulik, 1995).

Anxiety is a general term used to describe arousal of the autonomic nervous system accompanied by subjective feelings of distress, worry, apprehension and tension. Anxiety can be broken into two constructs: state (A-state) and trait (A-trait) anxiety (Spielberger, 1972). Arousal due to state anxiety occurs whenever an individual interprets a particular situation or stimulus as threatening and dangerous and /or has the potential to be harmful. Trait anxiety refers to an individuals susceptibility to anxiety as a personality trait. Trait

anxiety is thought to influence the intensity and frequency of state anxiety that a person experiences in relation to experiences in the environment. For example,

“Persons high in A-Trait...are disposed to perceive the world as more dangerous or threatening than low A-Trait individuals. High A-Trait individuals are more vulnerable to stress and tend to experience A-State reactions of greater intensity and with greater frequency over time than persons who are low in A-Trait” (Spielberger, 1972, p. 482).

Spielberger suggests that cognitive estimates of danger appear to be the initial step in the arousal of an anxiety state, and corresponding re-estimates predict the intensity of these states and their persistence over time. Therefore someone who is high in A-Trait is more susceptible to elevated A-State and the possibility of developing a psychological disorder due to overvigilant cognitive resources or schemas. Pathological anxiety is characterised by inappropriate responses to a situation or stimulus where the intensity and/or duration of the anxiety does not match the actual threat present (Kaplan, Sadock, & Grebb, 1994).

Generalised anxiety disorder (GAD) is defined in the DSM-IV (American Psychiatric Association, 1994) as “excessive and pervasive worry, accompanied by a variety of somatic symptoms, that cause significant impairment in social or occupational functioning or marked distress in the individual concerned”. The clinical features of this disorder are characterised by motor tension (shakiness, restlessness, and headaches), autonomic hyperactivity (shortness of breath, excessive sweating, heart palpitations and gastrointestinal complaints), and cognitive vigilance (irritability and easily startled). Comorbidity amongst GAD sufferers is high with as many as 50% suffering from another mental disorder.

Social phobia is characterised by pathological fear of embarrassment and/or humiliation in a variety of social settings, such as public speaking, asking someone to go out on a date, introducing yourself to strangers at a party. This fear causes the social phobic to avoid such situations, and if they cannot be avoided then the anticipation of the event and the actual event itself cause severe distress. The sufferer knows the reaction is excessive but they are unable to control it and therefore it disrupts their life. Both of these types of anxiety disorders are often responsive to specific pharmacological and cognitive/behavioural treatments (Kaplan, Sadock & Grebb, 1994).

Cooper et al (1992), using eating-, weight-, and shape-related words, found that bulimics showed significantly greater interference on the target card than the female control group, and that this interference was significantly correlated with scores on the Eating Attitudes Test (EAT; Garner and Garfinkel, 1979). However, once depression was controlled for this relationship disappeared. This suggested that depression, as opposed to eating disorder specific variables, may have accounted for the interference differences between the two groups. As noted, there is a high incidence of anxiety and affective disorders among the eating disordered population (Toner, Garfinkel & Garner, 1986, 1988). Bulik, Beidel, Duchmann, Weltzin, and Kaye (1991) compared four groups of women with anorexia nervosa, bulimia nervosa, college undergraduates and social phobics on measures of social phobia and found that the bulimic and anorectic patients had clinically significant social fears similar in magnitude to the social phobics who generally scored 12-14 points higher than the eating disordered patients. This suggests that eating disordered patients have fears of negative evaluation in social situations in general which are not specific to public eating related activities. A study by Schwalberg, Barlow, Alger, and Howard (1992) found that 40% of the bulimics in their study met DSM-III-R criteria for major depression or dysthymia and 80% had a history of one or more anxiety disorders. Within this sample the prevalence rates for social phobia and generalised anxiety disorder were 40% and 55% respectively. Schwalberg et al., suggested that social evaluation fears and/or a personality disposition towards generalised anxiety plus societal, psychological and biological factors may lead to the development of over concern with shape and weight, chronic dietary restraint culminating in dietary restraint. However, the role of anxiety and depression in Bulimia Nervosa has not been clearly established.

Proponents of a 2-factor model of anxiety in bulimia, theorise that eating and bingeing produces anxiety and vomiting and other types of purging reduces it (for example, Rosen & Leitenberg 1982; Leitenberg, Gross, Peterson, & Rosen 1984; Wilson, Rossiter, Kleifield & Lindholm 1986). Hence once an individual has learned to reduce their anxiety and fears of weight gain the vomiting becomes positively reinforced and increases in frequency. This model has provided successful behavioural interventions for reductions in the binge-purge cycle, for example, exposure with response prevention where an individual is instructed to binge to the point where they want to purge but are encouraged by their therapist who is with them at the time to resist it. Therefore they are prevented from using the escape-

avoidance response of purging to reduce their anxiety which in turn is no longer positively reinforced. Although this model provides successful treatment strategies it is not sufficient to provide a comprehensive etiology for bulimia, (for example, what causes the bingeing/purging to occur initially), and it does not take into account psychological and societal factors as discussed earlier on. Mizes (1988) compared bulimics to controls who were screened to exclude any eating related pathology using a battery of tests including the BDI and the STAI. The bulimic group scored significantly higher than the controls on the BDI, and both state and trait anxiety. Given the relationship between anxiety and eating disorders the present study aimed to assess the influence of trait anxiety on performance on a modified Stroop task using anxiety words and restrained and unrestrained eaters. Additionally, the present study aimed to control depression so as to assess its impact on the performance of subjects on the food, weight and shape target Stroop card and the anxiety target Stroop card.

Mathews and MacLeod (1985) found that all anxious subjects showed interference on socially threatening words but only those who were conscious of physical worries showed equivalent interference on the physical threat words. For this reason the modified anxiety Stroop task used in the present study contained 5 randomly chosen words from Mathews and MacLeod's list of socially threatening words. They drew their list of social threat words from descriptions given by Beck, Laude and Bohnert (1974) and Hibbert (1984). These words were frequency matched with 5 positive non-threat words which were used as the control card for the anxiety Stroop task in the present study. The most predictive factor contributing to the general interference effect of threat appears to be trait anxiety (Mogg, Mathews & Weinman, 1989).

Mathews and Sebastian (1993) suggest that Stroop interference effects on emotional words depend on three factors: fearfulness or levels of trait anxiety, a match between emotional concerns of the participant and word meaning and some kind of state effect associated with current stress of the individual. High trait anxiety individuals give more attention to the more threatening aspects of their environment suggesting a systematic bias in the cognitive system (Fox, 1993). Richards and Millwood (1989) compared high trait anxiety individuals to low trait anxiety counterparts using a modified Stroop task consisting of threat, neutral and pleasant words. The low trait anxiety group had similar response latencies to the three

word groups but the high trait anxiety group had the fastest response times to the pleasant words and the slowest response latencies to the threat words. These results suggest that people who have high levels of trait anxiety may be more vigilant to threatening information in their environment than people who have low levels of trait anxiety.

When restrained eaters are in an anxiety provoking situation which produces threat to self-esteem, (for example, when confronted with diet-related images during strong emotional states (Strauss, Doyle & Kreipe, 1994)), there is a strong tendency for them to overeat or binge to relieve their distress (Polivy, Herman & McFarlane, 1994). This phenomenon is not apparent when the source of distress is a physical threat such as an anticipated electric shock (Heatherton, Herman & Polivy, 1991). Restrained eaters have lower state and trait self-esteem than unrestrained eaters (Polivy, Herman, McFarlane, 1994). The high rates of anxiety disorders among eating disordered populations and the relationship of anxiety to dietary restraint suggest that people with eating disorders, restrained eaters and unrestrained eaters may lie on a continuum with regard to anxiety. For example, restrained eaters may have higher levels of anxiety than unrestrained eaters, but not as high as people with an eating disorder. Related to this is the possibility that people who have high trait anxiety may be more open to socially threatening cues in the environment. If this were combined with specific concern about appearance, body size and weight then this could lead to anxiety about weight. Such a person might then develop behaviors to change their weight and therefore reduce their anxiety. These behaviors may manifest themselves in the symptoms common among restrained eaters and people with eating disorders. For example, the binge/purge cycle in bulimia, and the chronic dieting and weight fluctuations found in restrained eaters.

Why does Stroop interference occur?

The modified Stroop task using food, weight, and shape related words may activate highly structured self-schema corresponding to these word groups in people who are eating disordered and/or people who are chronically weight preoccupied (restrained eaters). Activation of these schema facilitate encoding, processing, or retrieval of relevant information resulting in delayed response times on the Stroop modified task when compared to people who are not preoccupied with such word groups.

Bower's (1981) cognitive theory of emotionality predicts that emotionally loaded words (for example, food, weight, and shape related words) activate emotion nodes (for example, depression and anxiety) and memories associated with the emotion nodes (for example, feelings of inadequacy and sadness when a bulimic female compares herself to 'waif' models in a fashion magazine) resulting in activation and increased accessibility of such word groups.

A schema model assumes that the material relevant to the individuals concerns attracts disproportionately more processing resources due to the activation of specific knowledge structures representing the personally relevant material. Therefore "anxiety-prone individuals would be expected to have better developed or more dominant cognitive structures concerned with the processing of danger-related material" (Mogg, Mathews, & Weinman, 1989, p.321). The lack of memory bias found for the words used in Mogg et al's study was thought to suggest that "in anxiety states, a cognitive bias favouring threat stimuli may operate at relatively early stages of processing, such as attention, but not at later stages, such as those involved in memory", (p. 321.).

It appears that socially anxious individuals interpret information so as to be consistent with their own negative self-views and are much more attentive to evaluative social cues in the environment (Mattia, Heimberg & Hope, 1993). For example, O'Banion and Arkowitz (1977) found that regardless of the outcome of a interpersonal interaction, socially anxious women recalled more negative feedback than their non-anxious counterparts.

Bower's (1981) network model of emotion proposes that the induction of a mood results in the automatic activation of representations of relevant information in memory which leads to selective processing of mood-congruent information. Mogg, Kentish and Bradley (1993) provide evidence for supporting this theory with their study which found that induced relaxed mood appeared to produce an automatic processing bias for positive material.

Cognitive Structures

An individuals response to external situations depends on their rapid cognitive analysis of the components of the situation and of any personal resources they may have to use to deal with

any particular situation. Because people face the same situations in the environment many times they use past experiences to prepare them for what to expect and how to act.

“This advance preparation involves the activation of ‘cognitive structures’ (schemas) that orient the individual to a situation and help them to select relevant details from the environment and to recall relevant data. At times a person may be over prepared, so that they ‘see’ what they expect to see instead of what is actually present in the situation.” (Beck, Emery & Greenberg, 1985, p. 54).

Schemas are proposed by Beck et al., to be the basic structural components of cognitive organisation and are thought to be broken down into cognitive constellations which are then grouped into subsystems called modes. A person’s cognitive set is the result of the controlling cognitive constellation and provides a composite picture of a specific situation. When a specific schema or a constellation (group) of schemas is activated, their content directly influences the content of a person’s perceptions, interpretations, associations, and memories at a given time as cognitive schemas are used to label, classify, interpret, evaluate, and assign meanings to objects and events (Beck et al, 1985). Schemas vary in capacity and use, for example, a schema may only be used for labelling a discrete set of objects such as eating utensils or a schema may have a broad and abstract content such as when it incorporates concepts and terms like ‘beauty’, ‘confidence’ and ‘self-esteem’. When the relevant schema(s) are activated for a particular situation they are used to evaluate and provide meaning to the event. A final interpretation of the event is a result of interaction between the event and the schemas where the content of the schema dictates the broad range of affective and behavioural responses (Beck et al, 1985). These schema consist of specific concepts, assumptions, overlays, and rules that are applied to a given situation at a given time and are needed to obtain meaningful information from the environment. Schema or cognitive constellations are thought to allow us to sift through the endless amounts of information and data coming to us from the environment so that only the relevant and important data is processed allowing us to form relationships between actions and objects and to form meaningful patterns of what occurs in the environment. Our schemas allow us to make generalisations out of the constant bombardment of information coming to us from our sensory attributes. Once activated a constellation rapidly processes incoming information or data and it has the capacity to block out inconsistent or irrelevant information. They enable a person to obtain the greatest amount of information relevant to

the present concern in the shortest possible time. However, as well as using exclusionary principles these constellations tend to be over inclusive so that ambiguous stimuli are counted as relevant to that particular schema(s) and are therefore a false positive. Ultimately 100% accuracy is traded in for extremely rapid processing and response times. Once a constellation is activated then it becomes extremely sensitive so that the number of false positives increases and the number of false negatives decreases.

Applying these processes in the context of the present study, it could be argued that females' (predominately) self-evaluative and self-esteem schemas/cognitive constellations process information and data from the media (T.V, magazines and the movies) which promote the ideology that to be beautiful, sexy, successful, healthy and attractive to the opposite sex you must be size 10 or less and very lean. These people's schemas become so sensitive to these particular messages that they base much of their self-worth on them and the related cognitive constellations will not differentiate false negatives. That is, once these schemas are established they do not process information from the environment which will enhance the persons self-worth. For example, a young woman may decide that she is not a worthy person because she is size 16 and doesn't fit the physical profile of the ideal woman as portrayed by the media. Her cognitive constellations sift through the related information and she comes to the decision that she needs to diet and lose weight to fit in with this mass culture ideal and therefore gain self worth. Because her schema have become so sensitive to information concerning the cultural ideal female body type and the positive characteristics associated with it and how to obtain such a body, they do not process other information from the environment concerning self-esteem. For example, positive attributes such as self-worth based on intelligence, being good at sport or having noteworthy personality characteristics (fun, charismatic, fair, empathetic, sympathetic, compassionate, leadership skills, courageous). Such data from the environment have weaker and less salient messages than the body type messages, therefore they are screened out by the oversensitive cognitive constellations. Individuals who are preoccupied with their appearance in terms of body-shape and weight may develop cognitive biases which are specific to fear of fatness and contribute to misperceptions of body shape and weight (Sebastian, Williamson, & Blovin, 1996).

AIMS AND HYPOTHESES

Aims

The present study aims to replicate Cooper et al's (1992) study by comparing restrained and unrestrained eaters using the same food, weight and shape target and control cards and conflicting colour card. Following their study, depression will be investigated to determine if it has an influence over any group differences found on the Stroop tasks. The present study additionally aims to determine if there are differences between restrained and unrestrained eaters in relation to anxiety using a modified Stroop task with anxiety target and control words and by measuring trait anxiety.

Hypotheses

The following hypotheses relate to females only and they involve the theory that eating disordered individuals, restrained eaters and unrestrained eaters may be on a continuum in relation to eating related pathology (for example, anxiety and depression) and interference indices on modified Stroop tasks. The present study compares restrained and unrestrained eaters on measures of depression and anxiety and Stroop tasks involving food, weight and shape words and anxiety words. Hence the first, second and third hypotheses are:

1. Restrained eaters will have larger interference indices on the food, weight, and shape Stroop than unrestrained eaters
2. Restrained eaters will have larger interference indices on the anxiety Stroop task than unrestrained eaters
3. Restrained eaters will have higher levels of trait anxiety and depressive symptomatology than unrestrained eaters

The Cooper et al (1992) study found that when depression was controlled for the significant differences found between subjects with eating disorders and control subjects on the food, weight and shape Stroop task disappeared. Therefore to test whether any group differences found in the present study between restrained and unrestrained eaters on the two modified

Stroop tasks are due to the word content of the cards or are caused by other variables the fourth hypothesis is:

4. The interference indices effects hypothesised in 1 and 2 above will disappear when depression and/or trait anxiety are controlled for.

METHOD

Constraints on the present study

The original intention of this study was to compare females with eating disorders to female restrained and unrestrained eaters on the two modified Stroop tasks involving food, weight and shape words and anxiety words. It was also intended to compare these three groups on measures of eating, depression and anxiety. This study was approved by two ethics committees, the Massey University Ethics Committee and the Wanganui-Manawatu Area Health Ethics Committee, to include all three proposed groups of subjects. Eating disordered individuals were to be recruited on a voluntary basis by practitioners informing their eating disordered clients about the present study and requesting they contact the researcher if they were willing to participate. Based on local prevalence estimates of eating disordered individuals it was anticipated that between 10 and 30 eating disordered individuals would volunteer. However, only one person meeting this diagnostic criteria volunteered. Therefore the present study is written without the inclusion of such subjects in the method and procedure sections.

Subjects

In the initial phase subjects were obtained from undergraduate classes at Massey University. Male and female volunteers were asked to read a brief description of the experiment (see Appendix 1) and to complete a three page questionnaire labelled 'Eating Habits Questionnaire' (EHQ) which consisted of the Restraint Scale (RS; Herman & Polivy, 1980), the trait anxiety section of the State-Trait Anxiety Inventory (STAI; Spielberger, 1983), and the Beck Depression Inventory (BDI; Beck & Steer, 1987). The researcher gave a brief explanation of the experimental procedure, and emphasised that it was voluntary, anonymous and completely confidential.

In total 181 subjects completed the initial screening phase of which 50 (28%) were male and 131 (72%) were female. Female subjects were asked to volunteer to participate in Phase 2 of the study which required completion of additional measures and five Stroop tasks. Fifty-five (30%) of the available females completed both phases.

Gender differences

The mean age, height, weight, body mass index ($BMI = \text{weight (kg)} / \text{height (m)}^2$) are shown in Table 1, together with scores on the restraint scale, trait anxiety (from the STAI) and BDI (Beck Depression Inventory) comparing males and females.

Table 1

Characteristics of males and females as an overall comparison.

Measure	Males			Females		
	n	M	SD	n	M	SD
age (years)	50	21.74	4.83	131	22.72	7.43
height (m)	50	1.79*	0.05	127	1.66*	0.07
weight (kg)	50	77.79*	9.33	127	63.04*	9.62
BMI	50	24.19*	2.82	123	22.94*	3.53
Restraint Scale	50	8.02*	5.21	131	12.66*	5.87
Trait Anxiety	50	39.26	8.11	130	40.50	8.93
BDI	50	6.02	5.55	129	7.39	6.15

Note: $BMI = \text{weight (kg)} / \text{height}^2 \text{ (m)}$, $*p < .05$

There were no significant differences between males and females in age, trait anxiety and depression scores. However, as expected males were significantly taller, $t(119.83) = -13.67$, $p < .05$, heavier, $t(175) = -9.26$, $p < .05$, had larger Body Mass Indices, $t(171) = -2.24$, $p < .05$, and smaller Restraint Scale scores, $t(179) = 4.90$, $p < .05$, than females. All subsequent analyses involve females only.

Comparison of females who completed the initial phase only to females who completed Phase 2

In order to clarify any differences between the participants who only completed the initial phase of the study and those who completed the second phase, and to determine the representativeness of those in the second phase, comparisons were made on the measures of age, height, weight, BMI, restraint, anxiety, and depression. The comparisons of the two groups on these measures are shown in Table 2.

Table 2

Characteristics of females who completed the second phase compared to females who completed phase one only.

Measure	Phase Two Completed			Phase One Only		
	n	M	SD	n	M	SD
age (years)	55	24.73*	8.59	76	21.26*	6.12
height (m)	54	1.67	0.07	73	1.66	0.07
weight (kg)	53	63.43	7.70	74	62.76	10.83
BMI	52	22.70	2.39	71	23.11	4.18
Restraint Scale	55	12.51	5.88	76	12.78	5.90
Trait Anxiety	54	38.04*	9.98	76	42.25*	7.69
BDI	55	6.85	7.55	74	7.78	4.88

Note: BMI = weight (kg) / height² (m), *p < .05

The females who completed both phases did not differ significantly on height, weight, BMI, or on restraint and BDI scores from the females who completed the initial phase only. This shows that the two groups were comparable on these measures and had similar characteristics. Those who had completed the second phase were significantly older, $t(92.05) = 2.56$, $p < .05$, and had significantly lower trait anxiety scores, $t(95.18) = -2.60$, $p < .05$, than those who had completed phase one only.

Materials-Instruments

The Stroop Colour-Naming Cards

The five cards containing the standard Stroop task, the food, weight, and shape target words plus the relevant control words, and the anxiety target words and anxiety control words were constructed as described by Cooper et al (1992). Full descriptions of these cards follow.

Food, weight, and shape target and control cards, and conflicting colour card

The ink colours used were orange, yellow, blue, green and black. The words were be printed in block capitals 0.5 cm high in one of the five different colours. The cards were 29.7 cm by 21 cm and coloured white with the words appearing in 10 rows of ten. On each card the relevant stimulus words (five for each card) were repeated 20 times and words on the target and control cards have been matched for number of letters and frequency of use (Cooper et al., 1992).

For the target card the words used were; fat, diet, thighs, cakes and hips (see Appendix 2). On the control card the words were; sit, dare, filter, tower and wool (see Appendix 3). The conflicting-colour card used the words orange, red, blue, green and brown (see Appendix 4). The stimulus words on the target and control cards were repeated, in random order, twice in each row with no immediate repetition of the stimulus words or the colours within a row. The conflicting colour card had none of the words appearing in its own ink colour. The conflicting colour card was used as a control check to ensure that the subject groups did not differ in their cognitive ability to complete a task where colour naming interference is a reliable phenomenon. Therefore any group differences found with colour naming times of the conflicting colour card would indicate that the groups were not similar in terms of cognitive colour naming ability and thus it would not be appropriate to compare them on other colour naming tasks.

Anxiety target and control card

The two remaining cards using anxiety target words and anxiety control words from Mathews and MacLeod's (1985) list were designed in a similar manner to the cards above. The ink colours used were orange, yellow, blue, green and black. The words were printed in block capitals 0.4 cm high in one of the five different colours. Because the anxiety words and anxiety control words were longer than the words used for the three cards mentioned above they were printed 0.1 cm smaller so that all the cards had similar style of presentation. The cards were 29.7 cm by 21 cm and coloured white with the words appearing in 10 rows of ten. On each card the relevant stimulus words (five for each card) were repeated 20 times and words on the target and control card have been matched for frequency of use (as detailed by Mathews and MacLeod). For the target card the words used were; failure, pathetic, inferior, lonely and stupid (see Appendix 5). On the control card the words were; relaxed, confident, bold, assured, and capable (see Appendix 6). The stimulus words on the target and control cards were repeated, in random order, twice in each row with no immediate repetition of the stimulus words or the colours within a row.

To determine whether the amount of interference caused by the target cards was related to subject characteristics, comparisons between the subject groups were made with the following measures:

Body Mass Index (BMI)

This was calculated by dividing weight by height squared ($BMI = \text{kilograms} / \text{metres}^2$) (Keys, Fidanza, Karvonen, Kimura & Taylor, 1972). The resulting number gives an indication of body fat content where $BMI \leq 19$ indicates underweight, $BMI = 20-25$ indicates normal weight, $BMI = 26-30$ indicates overweight, and $BMI > 31$ indicates obesity (Keys et al, 1972; Killeen, Vanderburg & Harlon, 1978).

Restraint Scale

The Restraint Scale (RS; Herman and Polivy, 1980; see Appendix 7) assesses over-concern with body weight and the chronicity of dieting to control body weight. The RS is a 10 item self-report questionnaire which assesses weight fluctuations, chronic dieting and related attitudes and one item which asks for the maximum weight ever. Items require Likert-type responses with either 4 or 5 response options. There is no reverse scoring so that each item is scored 0, 1, 2 or 3 (4 response options) or 0, 1, 2, 3, or 4 (5 response options). Scores range from a maximum of 35 to a minimum of 0. The RS also consists of 5 unscored questions concerning age, sex, weight, height, and maximum weight ever. This scale takes approximately 5 minutes to complete and for the purposes of this study, as recommended by Polivy, Herman and Howard (1988), it was titled 'Eating Habits Questionnaire' to reduce its apparent focus on dieting. In asking people about their weight fluctuations Herman and Polivy (1980) required answers in pounds (lb.). Due to New Zealand using the metric system, the RS was modified so as subjects could also give their answers in either pound (lb.) or kilogram (kg) equivalents.

Internal reliability of the RS is adequate with item total correlations ranging from 0.413 to 0.777 for female subjects, and 0.303 to 0.676 for male subjects. Test-retest reliability of the RS with a one week interval between testings yielded a correlation coefficient of $r = .93$. Long term test-retest reliability of the RS has shown to be high with one study having a 2 1/2 year interval between testings which yielded an intraclass correlation of $r = .74$ (Klesges, Klem, Epkins, & Klesges, 1991). The alpha reliability coefficient for the RS, when used with normal weight groups, have ranged from $r = .79$ (Johnson, Lake, & Mahan, 1984) to $r = .86$ (Ruderman & Christensen, 1983). Norms for males and females are significantly different with males (on average) consistently scoring lower than females. For female

college students the median is usually a score of 15 or 16, and for male college students a score of approximately 12 (Polivy, Herman & Howard, 1988).

The RS was compared to the Three Factor Eating Questionnaire (TFEQ; Stunkard & Messick, 1985) and the Dutch Eating Behaviour Questionnaire (DEBQ; Van Strien, Frijters, Bergers, & Defares, 1986) by Laessle, Tuschl, Kotthaus and Pirke (1989). These scales are all measures of restrained eating and significant correlations were found between the RS and the TFEQ-R ($r = 0.35$, $p < .01$), and between the RS and the DEBQ ($r = 0.59$, $p < .0001$). The RS was chosen over other dietary restraint scales because a high score on the RS is closely related to consequences of mostly unsuccessful dieting, such as binge eating and weight fluctuations (Laessle, Tuschl, Kotthaus and Pirke, 1989). These behavioural characteristics are present among individuals who go on to develop bulimia nervosa.

Trait Scale of the State-Trait Anxiety Inventory

Trait anxiety (assessed via the State-Trait Anxiety Inventory, STAI-Y; Spielberger, 1983; see Appendix 8) was measured among subjects to determine if it has any involvement in interference differences found between the groups on the Stroop tasks. The trait scale consists of twenty statements that evaluate how respondents generally feel. The respondents are requested to indicate how they generally feel by rating the frequency of their feelings of anxiety on a four point Likert-type scale (1 = almost never, 2 = sometimes, 3 = often, 4 = almost always). Items 1, 3, 6, 7, 10, 13, 14, 16, 19 are reversed scored and the total scale score is obtained by adding the score for each item. The minimum possible score is 20 indicating very low trait anxiety and the maximum score is 80.

Test-retest reliability for the trait scale, using high school students, found after a thirty day interval correlation coefficients of $r = .71$ for males and $r = .75$ for females. After a sixty day interval the coefficients were $r = .68$ for males and $r = .65$ for females (Spielberger, 1983). These results suggest that the trait form has adequate stability over a relatively long retest period. Additionally internal consistency was demonstrated by calculating alpha coefficients which gave a median coefficient of $r = .90$ (Spielberger, 1983).

Evidence of construct validity for the trait scale was shown when neuropsychiatric patient (NP) groups were compared to normal subjects and it was found that the NP group had a

higher average score (46.62) than the working adult normal subjects (34.89). To demonstrate concurrent validity the trait form of the STAI was correlated with the IPAT Anxiety Scale (Catell & Scheier, 1963). The IPAT and trait anxiety scale correlations were high, indicating that the trait scale of the STAI does adequately measure trait anxiety. Proof for convergent and divergent validity of the trait scale was shown by correlations with the Cornwell Medical Index and the U.S. Army Beta intelligence test. The former revealed a correlation of .70 indicating that a large number of medical symptoms are associated with high trait anxiety (Spielberger, 1983). The latter gave a correlation of -.03 showing that the STAI trait anxiety is unrelated to the concept of intelligence.

Beck Depression Inventory

The Beck Depression Inventory (BDI; Beck and Steer, 1987; see Appendix 9) was administered because depression is a common complication amongst subject populations and depressive symptomology is a variable that could contribute to any group differences found on the modified Stroop tasks. It has become one of the most widely used and accepted psychometric tests for assessing the intensity of depression in clinical populations (Piotrowski, Sherry, & Keller, 1985) and for detecting possible depression in non clinical populations (Steer, Beck, & Garrison, 1985). The BDI is a 21 item inventory designed to assess the severity of depression in adolescents and adults. Each item on the BDI is rated on a 4-point scale ranging from 0 to 3, with a total score obtained by adding the rating for each item. If a participant chooses more than one statement within an item then the statement with the highest rating is used in generating the total score (Beck & Steer, 1987). BDI scores of 0 to 9 are considered to be non-symptomatic, scores 10 to 18 indicate mild to moderate depression, scores 19 to 29 indicate moderate to severe depression, and scores 30 to 63 indicate extremely severe depression (Beck & Steer, 1987).

Mixed results have been found regarding the stability or test-retest reliability of the BDI. Using a non-psychiatric sample of 204 undergraduates Lightfoot and Oliver (1985) found a test-retest correlation of .90 over a two week interval. In contrast Zimmerman (1986) found a test-retest reliability of .64 over a one week interval with 139 undergraduates. As the BDI instructs the respondent to "circle the number which best describes the way you have been feeling the past week" (Beck & Steer, 1987, p. 5) and depending on the individuals experiences in the week preceding completing the test (for example, major surgery, exams,

discovering ones partner in bed with another person) the possibility of total scores being transient is high. Therefore in the present study the participants who completed the second phase of the study were asked to complete the BDI again.

In terms of content validity when the BDI was compared to the DSM-III Affective Disorder criteria by Moran and Lambert (1983) it was concluded that the BDI assessed six out of nine of the DSM criteria. Sleeping and eating disturbances were not fully addressed in that the BDI does not assess increased sleeping and food intake which are symptoms of some depressed people. Also the BDI does not assess psychomotor activity and agitation. Beck and Steer's rationale for leaving out these components is that approximately 72% of severely depressed patients have loss of appetite and 87% report sleep impairment (Beck, 1967), which they considered were too low a percentage to include within the BDI. They did not consider agitation "appropriate for a self-report instrument" (Beck & Steer, 1987, p. 15).

Eating Disorder Inventory

The Eating Disorder Inventory (EDI-2; Garner, 1991) is a broad screening device which measures psychological, cognitive and behavioural characteristics associated with eating disorders and differentiates individuals with eating disorders from those without eating disorders. The cover page of the EDI-2 item booklet consists of 21 questions regarding an individual's weight history (see Appendix 10) and takes approximately 5 minutes to complete. The detailed weight history information provided by individuals can be used to help screen for people who currently, or have previously suffered from an eating disorder. The other 3 pages of the inventory consist of 91 items (see Appendix 11) which require respondents to decide the extent that each item applies to their lives on a 6-point Likert-type scale from "always", "usually", "often", "sometimes", "rarely", or "never". Items are positively and negatively scored with the positive items scored as follows: always = 3, usually = 2, often = 1, sometimes = 0, rarely = 0, and never = 0. The negative items are scored as follows: never = 3, rarely = 2, sometimes = 1, often = 0, usually = 0, and always = 0. The EDI-2 consists of 11 subscales (Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, Maturity Fears, Asceticism, Impulse Regulation and Social Insecurity), with the Drive for Thinness, Bulimia and Body Dissatisfaction subscales designed to assess attitudes and behaviours concerning eating, weight and shape. Subscale scores are simply computed by adding all

item scores for that particular subscale. The higher the subscale score, the greater the manifestation of that particular trait (Garner, 1991). EDI-2 normative groups include 657 respondents with bulimia nervosa and 205 female college control nonpatients. Of the bulimic total 68 completed three additional subscales called Asceticism, Impulse Regulation and Social Insecurity which were added to the revised version of the EDI-2 (Garner, 1991).

Internal consistency of the EDI-2 subscales are high with reliability coefficients for eating disordered populations ranging from $\alpha = .70$ to $\alpha = .92$, and for nonpatient college women ranging from $\alpha = .44$ to $\alpha = .93$ (Garner, 1991; Raciti & Norcross, 1987). The EDI-2 manual does not provide information for test-retest reliability using the EDI-2 on eating disordered populations but there are studies reporting such data on nonpatient populations. Welch (1988) obtained retest coefficients of .79 to .95 for all the subscales except Interoceptive Awareness (.67) with a one week interval between tests. Wear and Pratz (1987) found retest reliabilities above .80 for all subscales apart from Maturity Fears with a three week interval between testings.

Efforts were made to achieve content validity in the construction of the EDI-2 through the generation of a pool of 146 items by experienced clinicians (both theoretical and practical) in the field of eating disorders (Garner, 1991). The items were designed to measure 11 constructs thought to be meaningful in eating disorders and these constructs were based on the clinical writings of prominent eating disorder theorists. Eight of the constructs survived reliability and validity requirements for a subscale. Additionally items were only retained if they were more highly correlated with their own subscale than with any other subscale (Garner, 1991). A high percentage of the items demonstrate face validity in that they directly relate to eating disorder issues.

Criterion related validity was incorporated into the construction of the EDI-2 as only those items that discriminated between eating disorder and nonpatient samples were included. It is therefore logical that EDI-2 subscales have shown to differentiate between eating disorder and nonpatient groups in subsequent studies (Garner, 1991). The EDI-2 illustrates convergent validity as its subscales correlate adequately with other eating disorder measures. For example, the EDI-2 subscale Drive for Thinness has been shown to have correlation

coefficients of $r = .71$ and $r = .61$ ($p < .001$) with EAT total scores and RS scores respectively (Garner, 1991).

There is evidence to suggest that the EDI-2 can differentiate Bulimics from Restrained eaters. Laessle, Tuschl, Waadt and Pirke (1989) found that Restrained eaters differed from Bulimic individuals on all of the EDI-2 subscales, and Lindholm and Wilson (1988) found that Bulimics differed from Restrained eaters on the Drive for Thinness, Bulimia, Ineffectiveness, and Interpersonal Distrust subscales. The EDI-2 was chosen for this study over the Eating Attitudes Test (Garner and Garfinkel, 1979) because the EDI-2's subscales give a detailed analysis of which cognitive and behavioural characteristics the subjects experience, producing more comprehensive and specific descriptions than the EAT's generalised total score allows.

Procedure

Subjects were approached during university lecture time and were asked to complete a 57 item questionnaire labelled the Eating Habits Questionnaire (EHQ). The EHQ consisted of the Restraint Scale, the trait form of the State-Trait Anxiety Inventory, and the Beck Depression Inventory. If female volunteers who had completed the EHQ wished to complete phase two of the study, which consisted of colour naming Stroop tasks and two more questionnaires (the Eating Disorder Inventory and the Beck Depression Inventory), they were asked to sign and complete the informed consent sheet (see Appendix 12) giving their name, phone number and a time to call. Once the subjects who had completed the informed consent sheet had been identified, they were contacted to make an appointment to complete the second phase. Appointments were conducted on a one to one basis in a quiet experimental room in the Psychology Department on Massey University campus. Women with a history of and/or current eating disorders were automatically excluded from the sample as were people with known clinical psychopathologies. This led to the exclusion of three female volunteers who during the second phase disclosed that they were currently seeking treatment and/or had a history of an eating disorder.

With female subjects who took part in phase two of the study a few minutes were spent at the beginning of each session to put the participant at ease and build rapport. It was emphasised once again that all information given was strictly confidential and anonymous.

Standardised instructions were used with all participants and were given as follows: The experimenter first explained to each participant that a colour naming task would first be completed followed by some questionnaires and that the entire procedure would take approximately 35-40 minutes. It was then explained that 5 cards would be presented one at a time and the experimenter would time how long it took them to name the ink colours of the words reading from left to right, top to bottom. Before the Stroop cards were presented participants were asked to say out loud the ink colours of two rows of zeros, with five zeros in each row. The zeros were printed in the ink colours used for the Stroop task and the purpose of presenting them to the participants was to eliminate anyone who was colour blind and to familiarise them with the colours so that all participants used the same colour names for the five different inks. The experimenter would then ask "Are you ready?" to which all participants answered affirmatively and the experimenter said "Go" and started timing. After the initial card the experimenter would say "It's the same thing with this card, just name the ink colours of the words, are you ready? Go" and this was repeated for each card until all five were completed. Between the presentation of each Stroop card the experimenter wrote down the time taken and there was a standard break of 30 seconds before the presentation of the next card. The time taken for each card was measured using an electronic stop watch which recorded to the nearest hundredth of a second. The Stroop cards were presented before the questionnaires as a colour unrelated word can be made to cause less interference with colour naming if its meaning is activated or primed by a related word shortly before the colour-naming trial (MacLeod, 1991). The five cards were presented in random order to counteract practice, fatigue and order effects as a precaution even though neither familiarity with the procedure (Walker, Ben-Tovim, Jones & Bachok, 1992) nor variations in the order of card presentation (Cooper et al, 1992) appear to effect the magnitude of interference (Vitousek & Orimoto, 1993).

At no time during the administration of the Stroop tasks were their content discussed and if participants asked questions the experimenter asked if they could be answered at the end of the entire procedure so as not to affect the results. All participants agreed to this. If during the Stroop tasks participants made comments concerning the difficulty or content of the cards the experimenter made no judgement or comment. Dialogue was kept to a minimum to prevent demand characteristics. The entire colour naming procedure took approximately 10 minutes.

Finally, the EDI-2, including the weight history information sheet were administered and the participants were retested on the BDI. The experimenter reviewed the instructions with the participant for both of these measures. For the weight history information sheet participants were told to answer the questions using the weight system (metric or Imperial) they preferred. Once the questionnaires had been completed participants had an opportunity to have their questions answered. Lastly the experimenter checked if the procedure had raised any personal issues which participants wished to ask about or discuss but in all cases it had not.

RESULTS

Data checking and screening

Data was missing on items of the Restraint Scale for 10 (18%) of the subjects who had completed both phases. So that their data could be included in all analyses Restraint Scale scores were prorated for each subject. Of the four subjects who had one item missing, two omitted item 4, one omitted item 3, and the fourth subject omitted item 1. The two subjects who had two items missing both omitted items 3 and 1. Three subjects had the same 4 items missing, consisting of items 2, 3, 4, and 11. One subject had 5 items missing consisting of items 2, 3, 4, 5, and 11. The 6 subjects who had more than one item missing indicated on their Restraint Scale forms that they did not know how to answer each particular question. This was indicated by question marks (two subjects) or short statements (four subjects). The content of the four short statements were: “No idea”, “I don’t watch my weight”, “Don’t know”, and “Don’t check”. The Restraint Scale is clearly stated and it is doubtful that subjects did not understand the questionnaire items. Therefore these questionmarks and statements were interpreted as meaning that the subject could not answer the questions because they did not regularly weigh themselves. These subjects would be unlikely to be restrained eaters because they appear unconcerned about their weight and weight fluctuations. If they had answered their missing items to the best of their ability it would be likely that their scores on these items would be low. Therefore it was considered appropriate to prorate the 6 subjects total scores who had more than 1 item missing. As anticipated the prorated scores placed these subjects within the unrestrained eaters group.

Proration occurred only on the Restraint Scale and only with the subjects who completed both phases of the present study. This was because the Restraint Scale total scores were essential data to compare restrained and unrestrained eaters on the Stroop tasks. It was also considered important to prorate this data as group numbers were low among subjects who completed Phase 2.

Prorating was preferred over other methods for managing missing data, such as replacement of total scores with group means (Tabachnik & Fidell, 1991), because it was considered important to allow most of each individuals unique information to remain. Prorating

involved the same procedure as used with other self-report measures (for example, STAI-Y, Spielberger, 1983). This procedure involved calculating the mean score for the scale items to which the subject responded on the Restraint Scale, multiplying this by 10 (the number of scored items on the Restraint Scale), and then rounding this number to the next highest whole number.

All variables approximated a normal distribution. While some were mildly skewed this was not severe enough to warrant transformation of the data. Analyses of the 5 Stroop task frequencies revealed outlying data. Analyses were run with and without outliers. However, because the removal of outliers did not effect overall results, and the sample size was small, it was decided to retain them in reporting the results.

Small variations in sample size occur between analyses, involving anxiety and depression scores, and height, weight and BDI information, due to missing data.

Comparison of restrained and unrestrained eaters

The total of 131 females were placed into two groups based on their restraint scale score. As recommended by Polivy et al (1988), a cut-off score of 16 and above was used on the restraint scale to classify subjects as restrained eaters and a score below 16 placed them in the unrestrained eater group. Polivy et al (1988) suggest that a score around 15 or 16 is typically the median found for female college students, and most studies comparing restrained and unrestrained eaters have used a cut off score of 16 (for example, Heatherton et al, 1988; Perpiñá et al, 1993). The mean age, height, weight, and body mass index, together with restraint scale, trait anxiety and BDI scores for the two groups are shown in Table 3.

Table 3

Mean Body Mass Index, restraint, anxiety and depression scores for restrained and unrestrained eaters.

Measure	Restrained Eaters			Unrestrained Eaters		
	n	M	SD	n	M	SD
age (years)	46	24.33	9.80	85	21.85	5.64
height (m)	45	1.68	0.07	82	1.66	0.07
weight (kg)	43	68.25*	10.55	84	60.38*	7.93
BMI	42	24.57*	4.36	81	22.09*	2.67
Restraint Scale	46	19.02*	3.02	85	9.22*	3.79
Trait Anxiety	46	42.59*	10.14	84	39.36*	8.02
BDI	45	9.13*	6.37	84	6.45*	5.85

Note: BMI = weight (kg) / height² (m), *p < .05

There were no significant differences between restrained and unrestrained eaters on age and height. Restrained eaters were significantly different from unrestrained eaters by being heavier, $t(66.97) = -4.31$, $p < .05$, and having larger BMI, $t(57.38) = -3.38$, $p < .05$. Restrained eaters also scored significantly higher than unrestrained eaters on the Restraint Scale, $t(129) = -15.12$, $p < .05$, trait anxiety, $t(128) = -2.00$, $p < .05$, and depression scales, $t(127) = -2.40$, $p < .05$.

The following analyses involved only those subjects who completed the second phase of the present study and consisted of 55 females who were divided into two groups based on their restraint scale score. The criteria used was the same as mentioned above with a cut-off score of 16. The restrained eaters group consisted of 21 subjects and unrestrained eaters group 34 subjects. The mean age, height, weight, body mass index are shown in Table 4, together with scores on the restraint scale, trait anxiety scale and the BDI.

Table 4

Mean Body Mass Index, restraint, anxiety and depression scores for restrained and unrestrained eaters who completed the second phase.

Measure	Restrained Eaters			Unrestrained Eaters		
	n	M	SD	n	M	SD
age (years)	21	28.86*	11.07	34	22.18*	5.37
height (m)	20	1.66	0.07	34	1.68	0.07
weight (kg)	20	65.98	8.25	33	61.89	7.02
BMI	19	24.07*	2.55	33	21.92*	1.93
Restraint Scale	21	18.57*	2.94	34	8.76*	3.69
Trait Anxiety	21	40.43	11.50	33	36.51	8.73
BDI	21	8.95	7.78	34	5.56	7.22

Note: BMI = weight (kg) / height² (m), *p < .05

There were no significant differences between the groups in height, weight, trait anxiety scores and BDI scores. The two subject groups did differ significantly in age, $t(25.92) = -2.58$, $p < .05$, and BMI, $t(50) = -3.45$, $p < .05$, with restrained eaters being older and having larger BMI than unrestrained eaters. As expected restrained eaters also had significantly higher scores on the restraint scale, $t(53) = -10.32$, $p < .05$, than unrestrained eaters.

It is noticeable that compared to these same comparisons on the larger sample of restrained and unrestrained eaters who completed the initial phase (see Table 3), significant differences between groups on weight, trait anxiety and depression scores are no longer present. While the lack of differences between restrained and unrestrained eaters may be attributable to a reduction in sample size, it is also probable that these differences were influenced by sampling bias as suggested by the results in Table 2.

Colour naming times

The raw colour colour-naming speeds for each card group are presented in Tables 5 and 6. The procedure followed Cooper and colleagues (1992; 1994) method to control for differences in general colour naming speed. Two interference indices were computed using the raw scores to represent the amount of disruption or interference caused to colour-naming times by the target cards and conflicting colour words when compared to the relevant control cards (Cooper, Anastasiades & Fairburn, 1992; Cooper & Fairburn, 1994).

The first index was a target interference index and was calculated by subtracting the control card time from the relevant target card time. For example, the food target interference index was calculated by subtracting the food control card time from the food target card time. Similarly the anxiety target interference index was calculated by subtracting the anxiety control card time from the anxiety target card time. The second index was a colour interference index and was calculated by subtracting the control card times from the conflicting colour card time. For example, the food colour interference index was calculated by subtracting the food control card time from the conflicting colour card time. The mean scores for the indices are also shown in Tables 5 and 6.

Table 5
Speed (seconds) of colour naming the food, weight and shape target and control cards (raw scores) and the interference indices for these cards in relation to restrained and unrestrained eaters.

Measure	Restrained Eaters n = 21		Unrestrained Eaters n = 34	
	M	SD	M	SD
Food, weight, and shape target card (seconds)	78.55	13.89	81.31	16.71
Food, weight and shape control card (seconds)	74.75	11.30	77.66	15.06
Food, weight and shape target interference index	3.81	6.24	3.65	8.85
Conflicting colour card (seconds)	100.70	18.63	100.71	19.72
Food, weight and shape colour interference index	25.95	12.65	23.05	11.36

Table 6

Speed (seconds) of colour naming the anxiety target and control cards (raw scores) and the interference indices for these cards in relation to restrained and unrestrained eaters.

Measure	Restrained Eaters n = 21		Unrestrained Eaters n = 34	
	M	SD	M	SD
Anxiety target card (seconds)	75.76	13.50	75.91	12.76
Anxiety control card (seconds)	74.76	14.61	75.63	14.45
Anxiety target interference index	0.99	5.23	0.28	6.85
Conflicting colour card (seconds)	100.70	18.63	100.71	19.72
Anxiety colour interference index	25.93	11.21	25.08	10.51

Mean raw scores comparing the two groups on the colour naming tasks and the interference indices for the food, weight, and shape words are shown in Table 5. For the anxiety words the mean raw scores and interference indices comparing the two groups are shown in Table 6. An independent groups t-test revealed no significant differences between groups on the conflicting colour naming task, $t(53) = 0.00$, $p > .05$. This was expected and indicates that the restrained eaters did not find the conflicting colour-naming task more difficult when compared to the unrestrained eaters, and the two groups had equivalent cognitive ability for colour naming tasks. There was no significant differences between groups with regard to food target interference and anxiety target interference indices, $t(53) = -0.07$, $p > .05$, and, $t(53) = -0.41$, $p > .05$, respectively.

Comparison of restrained and unrestrained eaters on the Eating Disorder Inventory (EDI-2)

Table 7 illustrates the scores of the two groups on the 11 subscales of the EDI-2 and compares them with the EDI-2 norms provided by Garner (1991).

Table 7
Comparison of restrained and unrestrained eaters to females with bulimia and female college controls on the EDI-2 subscales.*

EDI-2 Subscales	Garner and Olmsted (1983)*				Present Study			
	Bulimia Nervosa N=657		Female College Controls N=205		Restrained Eaters N=21		Unrestrained Eaters N=34	
	M	SD	M	SD	M	SD	M	SD
Drive for Thinness	15.0	5.0	5.5	5.5	5.4*	4.9	1.4*	2.6
Bulimia	10.8	5.4	1.2	1.9	1.2	1.6	0.5	1.3
Body Dissatisfaction	17.9	7.9	12.2	8.3	13.8*	7.8	6.6*	7.3
Ineffectiveness	11.0	7.5	2.3	3.6	2.2	4.3	1.5	4.0
Perfectionism	8.8	4.8	6.2	3.9	5.2	4.9	3.9	4.0
Interpersonal Distrust	5.3	4.5	2.0	3.1	2.2	2.4	1.4	2.1
Interoceptive Awareness	11.1	6.8	3.0	3.9	1.8	2.7	1.2	2.8
Maturity Fears	4.4	4.6	2.7	2.9	1.7	1.9	0.9	1.7
Asceticism	8.5	4.0	3.4	2.2	4.5*	4.8	1.9*	1.5
Impulse Regulation	6.1	5.4	2.3	3.6	2.6	3.7	1.2	3.2
Social Insecurity	8.2	4.5	3.3	3.3	3.2	2.7	1.9	3.4

Note: From Table 3 of the EDI-2 manual, Garner, 1991, p. 14, *p < .05 for significant differences between restrained and unrestrained eaters in the present study.

There were no significant differences found on 7 of the 11 scales. However, restrained eaters differed from unrestrained eaters by scoring significantly higher on the Drive for Thinness, $t(27.25) = -3.41, p < .05$, Body Dissatisfaction, $t(53) = -3.44, p < .05$, and Asceticism, $t(22.51) = -2.39, p < .05$, subscales.

DISCUSSION

Gender differences

Consistent with previous research, mean scores indicated that males were significantly taller, heavier and had larger body mass indices than females (Kenny & Adams, 1994). The mean male and female trait anxiety scores (39.26 and 40.50 respectively) found in the present study are consistent with the trait anxiety norms found for male and female college controls (mean scores of 38.30 and 40.40 respectively) (Spielberger, 1983). However, in the present study, males did not differ significantly from females on trait anxiety scores which conflicts with normative data which indicates that on average females score higher on trait anxiety than males (Spielberger, 1983).

Males differed significantly from females on the restraint scale indicating that female undergraduate university students are more likely to diet, have weight fluctuations and generally be more concerned with body weight than male undergraduate university students. This is consistent with prior research (Polivy, Herman & Howard, 1988) and fits the theory that females are generally more concerned about their weight than males.

Investigation into the differences found between restrained and unrestrained eaters

When female subjects were grouped together and placed into two groups of restrained and unrestrained eaters, significant differences in means between the groups were found for weight and body mass index. Restrained eaters were on average heavier (a difference between means of 7.86 kg) and related to this had larger BMI than unrestrained eaters. This finding has several explanations. Firstly, larger people may be more likely than lean people to diet in an attempt to fit the cultural ideal. Second, a study conducted by Klesges, Isbell, and Klesges (1992) over a 1 year period found that dietary restraint was associated with weight gain and a higher percentage of dietary fat intake when compared to unrestrained eating. As expected the groups differed on the restraint scale.

The restrained and unrestrained eaters also differed significantly in trait anxiety and depression scores, with the restrained eaters having higher mean scores on these measures

than unrestrained eaters. Elevated levels of trait anxiety in restrained eaters is consistent with the theory that eating and weight preoccupied individuals may have higher levels of general anxiety than people who are not preoccupied with such matters. Because of their high trait anxiety, people may be more likely to react to anxiety provoking situations with greater speed and intensity than their low trait anxiety counterparts. Relating this to social and self-evaluative situations, people who have high levels of trait anxiety may react more strongly to societies messages about weight and to situations in which social self-evaluation about appearance takes place, for example, reading a fashion magazine and walking down a crowded beach in a bikini. In reaction to becoming hypersensitive about appearance people may become more weight conscious, and therefore become firmly entrenched within dieting mentality and the restrained eating phenomenon. However, only an experimental design could clarify whether restrained eaters are more anxious due to eating related concerns or whether trait anxiety operates as a vulnerability factor leading to eating related problems.

Studies comparing subjects with eating disorders to controls on the Beck Depression Inventory (BDI; Beck & Steer, 1993) have consistently found those with eating disorders are significantly more depressed (for example, Laessle, Tuschl, Waadt & Pirke, 1989; Cooper, Anastasiades & Fairburn, 1992; Cooper & Fairburn, 1993). However, there are very few studies which have compared restrained and unrestrained eaters on the BDI. The present study found restrained eaters to have significantly higher depression scores on the BDI than unrestrained eaters which is opposite to a previous finding (see Laessle, Tuschl, Waadt & Pirke, 1989). Laessle et al., found no difference between restrained and unrestrained eaters on depression scores using the BDI. Comparisons between Laessle et al's results and those found for the present study must be made with caution as Laessle and colleagues used the Three Factor Eating Questionnaire (Stunkard & Messick, 1985) to measure dietary restraint, whereas the present study used the Restraint Scale (Herman & Polivy, 1980). Because of this it is possible that different constructs of dietary restraint are being measured with each construct having a unique relationship to depression scores on the Beck Depression Inventory. The results of the present study indicating that restrained eaters had significantly higher trait anxiety and depression scores than unrestrained eaters, support hypothesis 3. They also support the proposition mentioned earlier in the introduction that individuals with eating disorders, restrained and unrestrained eaters may be on a continuum with regard to eating related pathologies such as depression and anxiety.

When the subjects who completed the second phase of this study were placed into two groups on the basis of their restraint scale scores, it was found that the unrestrained and restrained eaters did not differ significantly in height and weight. The restrained and unrestrained eaters did differ significantly in age and BMI and on restraint scale scores. The BMI result may seem surprising because restrained eaters were not significantly heavier than unrestrained eaters. However, restrained eaters were on average 4.1 kilograms heavier and 2 cm shorter than unrestrained eaters and when these numbers were entered into the BMI equation could have produced the BMI significant difference between groups. The result from this group of subjects that restrained eaters were on average 6.7 years older than the unrestrained eaters may be related to the finding that females who completed the second phase of this study were significantly older than female subjects who completed the initial phase only. Therefore this phenomenon is likely to be an artefact and a result of sampling bias and a reflection of the characteristics of female subjects who volunteered for the second phase of this study. Contrary to previous results found when comparing restrained and unrestrained eaters within the overall female sample, there was no significant difference between restrained and unrestrained eaters who completed the second phase on trait anxiety and depression scores therefore this result does not support hypothesis 3. The lack of differences between restrained and unrestrained eaters who had completed Phase 2 may have been caused by the reduction in sample size. However, the participants who completed Phase 2 had significantly lower trait anxiety than the participants who completed the initial phase only, which suggests that a sampling bias may have occurred which may have contributed to the conflicting results.

Comparisons of restrained and unrestrained eaters on colour naming times for the Stroop tasks

In relation to the modified Stroop tasks, the current results have not supported the hypothesis that restrained eaters would have larger interference indices on the food, weight, and shape related Stroop task than the unrestrained eaters. These findings do not support previous results reported by Green and Rogers (1993), Perpiñá, Hemsley, Treasure and deSilva (1993) and Wilson (1989). However, they are consistent with the results found by Cooper and Fairburn (1992) and Mahamedi and Heatherton (1993).

A possible explanation for these studies finding conflicting results may lie in the different methods that each study has used in the application of the Stroop tasks and the use of different measures for identification of restrained and unrestrained eaters. Green and Rogers (1993) used the Dutch Eating Behaviour Questionnaire (DEBQ; Van Strien, Frijters, Bergers & Defares, 1986) to identify restrained and unrestrained eaters and subjects were presented with a computer-based version of modified Stroop tasks involving food words, body words and appropriate control words. Each word was presented individually on the screen and subjects pressed one of four buttons coded to match the four colours used. The colour naming latencies were divided into two groups: body shape and food. Restrained eaters were found to have significantly larger interference latencies on both word groups compared to unrestrained eaters. Differences between the DEBQ and the Restraint Scale (used in the present study) are discussed ahead.

Perpiñá et al. (1993) used the Restraint Scale (RS; Herman & Polivy, 1980) and presented subjects with modified Stroop tasks using cards which kept the different word groups separate so that food words were on one card and body words on another. Although this study found that high restraint was related to slower processing of food and body words this was found only when the restrained and unrestrained subject groups contained eating disordered individuals. When the control group was divided into restrained and unrestrained eaters a difference occurred between groups on the food Stroop task only. No such detail is available for the Wilson (1989) study.

The two studies that the present study supports are also diverse. Cooper and Fairburn (1992) used the concept of dieters instead of restrained eaters and classified these people by whether they had made an attempt to lose weight for at least four weeks. The modified Stroop tasks and words used were the same as the present study. Cooper and Fairburn found that females who were classified as dieters did not differ significantly from female non-dieters in terms of cognitive interference and food, weight and shape words. However, when dieters had a history of an eating disorder they showed interference similar to eating disordered individuals.

Mahamedi and Heatherton (1993) used the Restraint Scale to identify restrained and unrestrained eaters and used separate cards for body shape and food words. Initially they

found no difference between restrained and unrestrained eaters on food or body words. However, after all subjects had consumed a standard chocolate milkshake and repeated the same colour naming process as before, both groups showed increased interference for the body words but not the food words.

Conflicting results may also be the result of some studies use of separate lists for different word categories such as food words and body words (for example, Green & Rogers, 1993; Perpiñá et al., 1993; Mahamedi & Heatherton, 1993) and other studies present different types of word categories on the same card and have one colour naming interference index for this card (for example, Cooper & Fairburn, 1992). Additionally when studies use different words within the same category on the Stroop tasks, this may also produce conflicting results. For example, Perpiñá et al. (1993) used different food and body words to Cooper and Fairburn, (1992).

What these studies suggest is that different methods of investigating Stroop interference among restrained and unrestrained eaters using different measures of dietary restraint may produce conflicting results, such as Green and Rogers (1993) using the DEBQ, Cooper and Fairburn (1992) using a dieting concept, and Perpiñá et al., (1993) using the RS. Some support for this explanation was provided in a study which found that three popular measures of dietary restraint (the Restraint Scale (RS; Herman & Polivy, 1980), the restraint factor of the Three Factor Eating Questionnaire (TFEQ-R; Stunkard & Messick, 1985), and the restraint scale of the Dutch Eating Behavior Questionnaire (DEBQ-R; Van Strien, Frijters, Bergers, & Defares, 1986), quantified different components of the restraint construct (Laessle, Tuschl, Kotthaus & Pirke, 1989). Laessle et al conducted a factor analysis with these three scales and found that a high score on the RS was associated with outcomes of unsuccessful dieting (for example, weight fluctuations and uninhibited eating), but not with successful restriction of calories. High scores on the TFEQ-R and the DEBQ-R were found to be associated with the successful dieting behavior aspect of restraint.

The information from these studies suggest that if differences between restrained and unrestrained eaters exist within the Stroop paradigm, they may only be identified when target words are presented within the context of their own word group and colour naming times are calculated for each word group. Additionally, interference effects may only occur

when restrained eaters have been preloaded with a food that breaks their strict dieting regime prior to their completion of the Stroop task. Therefore, recommendations for future research would include the use of separate colour naming times for each word group and further investigation into the effects of preloading subjects with diet breaking foods on cognitive interference. Applying this to the present study, group differences may have been found if subjects had been preloaded with food before completion of the Stroop tasks, as discovered by Mahamedi and Heatherton (1993). Additionally, following the results of Perpiñá et al (1993), if the food, weight and shape word list had been made longer and presented on three separate cards and each word group had their own control words so that separate colour naming times and interference indices could be calculated for each word group, then group differences may have been found.

The present results also have not supported the hypothesis that restrained eaters would have larger interference indices on the anxiety related Stroop task than the unrestrained eaters. Why no interference differences between groups occurred on the anxiety Stroop task could be a reflection on the participants and their characteristics. As mentioned earlier, when females who completed phase one only were compared to females who had completed the second phase a significant difference in trait anxiety was found. The subjects who completed the second phase had on average trait anxiety scores 4.21 points lower than subjects who completed phase one only. This suggests that the participants who completed the Stroop tasks were on average less "symptomatic" in trait anxiety than the larger overall female sample. Consequently, sample bias may have occurred and acted as an artifact in the present study. It is plausible that only those subjects who had lower levels of trait anxiety volunteered to complete the Stroop tasks. Perhaps such subjects volunteered because they did not feel threatened or anxious about meeting with the experimenter on a one to one basis and completing an evaluative task and filling out further measures on emotive topics such as personal eating habits. As a consequence this could explain why no interference effects between groups were found for the anxiety modified Stroop task.

Similarly it is possible the lack of predicted effects lie with the reasons behind why emotional words tend to cause response latencies on modified Stroop tasks. There is an assumption that cognitive interference is automatic and cannot be controlled by the individual. However, it is possible that individuals with the appropriate motivation may be able to

control inference effects by increasing their efforts at avoiding attentional capture by specific stimuli relevant to personal concerns which could reduce interference effects (Mathews & Sebastian, 1993).

Comparison of restrained and unrestrained eaters to normative EDI-2 groups

Further evidence illustrating the possibility that the restrained and unrestrained eaters who completed the Stroop tasks may have had lower overall eating related pathology than the general population is shown in comparisons with normative bulimia nervosa and female college control groups for the EDI-2 (see Table 7). At a descriptive level it can be seen that the restrained eaters have comparable subscale scores to the female college controls. The restrained eaters scored less than or equal to the female college controls on Drive for Thinness, Bulimia, Ineffectiveness, Perfectionism, Interoceptive Awareness, Maturity Fears, and Social Insecurity subscales. The restrained eaters scored slightly higher than the female college controls on Body Dissatisfaction, Interpersonal Distrust, Asceticism, and Impulse Regulation subscales. This data tends to suggest that the restrained group, which in theory should have had higher EDI-2 subscale scores than the control group, was in fact similar to the female college controls. This finding could account for why no significant differences were found between restrained and unrestrained eaters on the food, weight and shape Stroop task in the present study. That is, the sample in the present study was a particularly nonpathological group.

Limitations

The results suggest that the variables of the female participants who completed the second phase of the present study were relatively consistent with those who volunteered for the initial phase only. The exceptions were on the variables of age and trait anxiety. This suggests that the recruitment process to encourage participants to complete the second phase of this study may have influenced people with certain personality characteristics to volunteer. In effect this may have contributed to the lack of differences on the modified Stroop tasks between restrained and unrestrained eaters. Recommendations for future research would include finding a method of participant recruitment which would ensure a representative sample. For example, financial inducements could have been used in this study to increase the number the subjects volunteering to complete the second phase.

Two further potential limitations of the present study involve the use of the Restraint Scale. Firstly, it is possible that the cut-off score used on the Restraint Scale to identify restrained and unrestrained eaters was too low to pick up group differences on the food, weight and shape Stroop task. It is recommended that future research on restrained and unrestrained eaters, as identified by the Restraint Scale, and their possible group differences on food, weight and shape related Stroop tasks, use a range of cut-off scores. This would allow the establishment of a cut-off score which would differentiate restrained and unrestrained eaters on food, weight and shape Stroop tasks, if such differences do exist. The second possible limitation involves the wording and the scoring of the Restraint Scale. As mentioned in the results section some participants found they could not complete some items of the Restraint Scale as they did not weigh themselves often enough to answer the weight oriented questions. The Restraint Scale may be able to improve its usefulness if it were to incorporate "I do not regularly weigh myself" answers to the weight questions and restructure the scoring of such items.

Conclusion

No significant differences in interference effects were found on the modified Stroop tasks. This may in part be due to the subjects in the present study having low levels of eating related pathology. The subjects had low trait anxiety compared to their control group (females who completed phase one only). When the group who had completed both sections was divided into restrained and unrestrained eaters no difference in trait anxiety scores were found. When these same restrained and unrestrained eaters were compared on EDI-2 subscale scores, and then compared to two reference groups (females with bulimia, and female college controls) on these same subscales, it became apparent that the restrained eaters had low levels of pathology. The restrained eaters scores were very similar to the females college controls, and the unrestrained eaters had scores well below the female college controls on all of the subscales. What had been expected was that the unrestrained eaters would have similar scores to the female college controls, and the restrained eaters would have scores falling between the females with bulimia and the female college controls. This outcome could explain why the restrained eaters did not differ from the unrestrained eaters on the food, weight, and shape Stroop card, and the corresponding interference index. Although the restrained and unrestrained eaters did differ significantly on Drive for Thinness and Body Dissatisfaction subscales of the EDI-2, and these subscales contain material

relevant to the food, weight, and shape Stroop task, it is possible that this Stroop task was not able to detect differences between restrained and unrestrained eaters. Related to this is the possibility that separate word lists for each word group and pre-loading with food may need to be used to identify differences between restrained and unrestrained eaters.

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Eating Habits Study Information Sheet



Who are the researchers? The researcher for this study is Philippa Strang, who is completing her MA in Psychology at Massey University. She is being supervised by Dr Frank Deane, who is a lecturer in the Department of Psychology at Massey University.

Where can they be contacted? Philippa can be contacted by phoning (06) 356-5992. Dr Deane can be contacted at the Psychology Clinic at Massey University, telephone 356-9099 extension 4126.

What is the study about? The aim of the study is to assess the relationship between women's eating habits and aspects of the way they think and feel. It is hoped that this will lead to better ways of assessing eating problems.

What will the participants have to do? If you decide to take part in the first section of this study you will complete a questionnaire which assesses your eating habits and how you are feeling. The second section of this study involves a task where you will be asked to name the ink colours of words printed on cards. You will also complete an additional questionnaire on eating habits. You may decide to participate in only section one of the study.

How much time will be involved? The initial questionnaire will take about 10 to 15 minutes to complete. The second part will take about 40 minutes, to be completed at a time convenient for you.

What can the participants expect from the researcher? All participants will receive full information about the study, and can ask questions at any time. You will have access to a summary of results on completion of the study. The results will be posted on the undergraduate notice board in the Psychology department. The only person who will be present during your participation in the second section of this study will be Philippa.

What are your rights? If you take part you have the right to:

- * withdraw from the study at any time
- * ask any further questions you may have
- * provide information on the understanding that it is completely confidential to the researchers
- * receive access to the results when the study is concluded.

If you only wish to complete section one of this study then you do not have to complete the consent form, since your answers will be entirely anonymous. Complete the attached consent form only if you are willing to complete both section one and two of this study.

Thank you for your time

Philippa Strang.

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Appendix 7: Restraint Scale

EATING HABITS QUESTIONNAIRE

The following questions refer to your normal eating patterns and weight fluctuations. Weight measures are provided in both pound and kilogram equivalents. Please answer using which ever you feel most familiar with.

Age: _____ Sex: _____ Height: _____ Weight: _____

1. How often are you dieting? (Circle one)

Never	Rarely	Sometimes	Usually	Always
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2. What is the maximum amount of weight you have ever lost in one month? (Circle one)

Pounds:	0-4	5-9	10-14	15-19	20+
Kilograms:	0-1.8	1.9-4.1	4.2-6.4	6.5-8.6	8.7+

3. What is your maximum weight gain within a week? (Circle one)

Pounds:	0-1	1.1-2	2.1-3	3.1-5	5.1+
Kilograms:	0-0.45	0.46-0.91	0.92-1.36	1.37-2.27	2.28+

4. In a typical week, how much does your weight fluctuate? (Circle one)

Pounds:	0-1	1.1-2	2.1-3	3.1-5	5.1+
Kilograms:	0-0.45	0.46-0.91	0.92-1.36	1.37-2.27	2.28+

5. Would a weight fluctuation of 5 lbs. or 2.3 kg. affect the way you live your life? (Circle one)

Not at all	Slightly	Moderately	Very much
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6. Do you eat sensibly in front of others and splurge alone? (Circle one)

Never	Rarely	Often	Always
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7. Do you give too much time and thought to food? (Circle one)

Never	Rarely	Often	Always
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8. Do you have feelings of guilt after overeating? (Circle One)

Never	Rarely	Often	Always
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9. How conscious are you of what you are eating? (Circle one)

Not at all	Slightly	Moderately	Very much
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10. What is your maximum weight ever? _____

11. How many pounds or kilograms over your desired weight were you at your maximum weight? (Circle one)

Pounds:	1<	1-5	6-10	11-20	21+
Kilograms:	0.45<	0.45-2.27	2.28-4.54	4.99-9.07	9.08+

Appendix 8: Trait Scale of the State-Trait Anxiety Inventory

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

	1 = almost never	2 = sometimes	3 = often	4 = almost always	
1	I feel pleasant.....	1	2	3	4
2	I feel nervous and restless.....	1	2	3	4
3	I feel satisfied with myself.....	1	2	3	4
4	I wish I could be happy as others seem to be.....	1	2	3	4
5	I feel like a failure.....	1	2	3	4
6	I feel rested.....	1	2	3	4
7	I am “calm, cool, and collected”.....	1	2	3	4
8	I feel that difficulties are piling up so that I cannot overcome them.....	1	2	3	4
9	I worry too much over something that really doesn’t matter.....	1	2	3	4
10	I am happy.....	1	2	3	4
11	I have disturbing thoughts.....	1	2	3	4
12	I lack self confidence.....	1	2	3	4
13	I feel secure.....	1	2	3	4
14	I make decisions easily.....	1	2	3	4
15	I feel inadequate.....	1	2	3	4
16	I am content.....	1	2	3	4
17	Some unimportant thought runs through my mind and bothers me.....	1	2	3	4
18	I take disappointments so keenly that I can’t put them out of my head	1	2	3	4
19	I am a steady person.....	1	2	3	4
20	I get in a state of tension or turmoil as I think over my recent concerns and interests.....	1	2	3	4

Appendix 9: Beck Depression Inventory

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

- 1 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 or unhappy that I can't stand it.
- 2 0 I am not particularly discouraged about the future.
1 I feel discouraged about the future.
2 I feel I have nothing to look forward to.
3 I feel that the future is hopeless and that things cannot improve.
- 3 0 I do not feel like a failure.
1 I feel I have failed more than the average person.
2 As I look back on my life, all I can see is a lot of failures.
3 I feel I am a complete failure as a person.
- 4 0 I get as much satisfaction out of things as I used to.
1 I don't enjoy things the way I used to.
2 I don't get real satisfaction out of anything anymore.
3 I am dissatisfied or bored with everything.
- 5 0 I don't feel particularly guilty.
1 I feel guilty a good part of the time.
2 I feel quite guilty most of the time.
3 I feel guilty all of the time.
- 6 0 I don't feel I am being punished.
1 I feel I may be punished.
2 I expect to be punished.
3 I feel I am being punished.
- 7 0 I don't feel disappointed in myself.
1 I am disappointed in myself.
2 I am disgusted with myself.
3 I hate myself.
- 8 0 I don't feel I am any worse than anybody else.
1 I am critical of myself for my weaknesses or mistakes.
2 I blame myself all the time for my faults.
3 I blame myself for everything bad that happens.
- 9 0 I don't have any thoughts of killing myself.
1 I have thoughts of killing myself, but I would not carry them out.
2 I would like to kill myself.
3 I would kill myself if I had the chance.
- 10 0 I don't cry any more than usual.
1 I cry more now than I used to.
2 I cry all the time now.
3 I used to be able to cry, but now I can't cry even though I want to.
- 11 0 I am no more irritated now than I ever am.
1 I get annoyed or irritated more easily than I used to.
2 I feel irritated all the time now.
3 I don't get irritated at all by the things that used to irritate me.
- 12 0 I have not lost interest in other people.
1 I am less interested in other people than I used to be.
2 I have lost most of my interest in other people.
3 I have lost all of my interest in other people.
- 13 0 I make decisions about as well as I ever could.
1 I put off making decisions more than I used to.
2 I have greater difficulty in making decisions than before.
3 I can't make decisions at all anymore.
- 14 0 I don't feel I look any worse than I used to.
1 I am worried that I am looking old or unattractive.
2 I feel that there are permanent changes in my appearance that make me look unattractive.
3 I believe that I look ugly.
- 15 0 I can work about as well as before.
1 It takes an extra effort to get started at doing something.
2 I have to push myself very hard to do anything.
3 I can't do any work at all.
- 16 0 I can sleep as well as usual.
1 I don't sleep as well as I used to.
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
3 I wake up several hours earlier than I used to and cannot get back to sleep.
- 17 0 I don't get more tired than usual.
1 I get tired more easily than I used to.
2 I get tired from doing almost anything.
3 I am too tired to do anything.
- 18 0 My appetite is no worse than usual.
1 My appetite is not as good as it used to be.
2 My appetite is much worse now.
3 I have no appetite at all anymore.
- 19 0 I haven't lost much weight, if any, lately.
1 I have lost more than 5 pounds. I am purposely trying to lose weight.
2 I have lost more than 10 pounds. by eating less. Yes _____ No _____
3 I have lost more than 15 pounds.
- 20 0 I am no more worried about my health than usual.
1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
2 I am very worried about physical problems and it's hard to think of much else.
3 I am so worried about my physical problems that I cannot think about anything else.
- 21 0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

Appendix 10: Eating Disorder Inventory cover page

DIRECTIONS

Enter your name, the date, your age, sex, marital status, and occupation. Complete the questions on the rest of this page. Then turn to the inside of the booklet and carefully follow the instructions.

Name _____ Date _____

*Age _____ Sex _____ Marital status _____ Occupation _____

A. *Current weight: _____ pounds

B. *Height: _____ feet _____ inches

C. Highest past weight excluding pregnancy: _____ pounds

How long ago did you first reach this weight? _____ months

How long did you weigh this weight? _____ months

D. *Lowest weight as an adult: _____ pounds

How long ago did you first reach this weight? _____ months

How long did you weigh this weight? _____ months

E. What weight have you been at for the longest period of time? _____ pounds

At what age did you first reach this weight? _____ years old

F. If your weight has changed a lot over the years, is there a weight that you keep coming back to when you are not dieting? ____ Yes ____ No

If yes, what is this weight? _____ pounds

At what age did you first reach this weight? _____ years old

G. What is the most weight you have ever lost? _____ pounds

Did you lose this weight on purpose? ____ Yes ____ No

What weight did you lose to? _____ pounds

At what age did you reach this weight? _____ years old

H. What do you think your weight would be if you did not consciously try to control your weight? _____ pounds

I. How much would you like to weigh? _____ pounds

J. Age at which weight problems began (if any): _____ years old

K. Father's occupation: _____

L. Mother's occupation: _____

Appendix 11: Eating Disorder Inventory

INSTRUCTIONS

First, write your name and the date on your EDI-2 Answer Sheet. Your ratings on the items below will be made on the EDI-2 Answer Sheet. The items ask about your attitudes, feelings, and behavior. Some of the items relate to food or eating. Other items ask about your feelings about yourself.

For each item, decide if the item is true about you ALWAYS (A), USUALLY (U), OFTEN (O), SOMETIMES (S), RARELY (R), or NEVER (N). Circle the letter that corresponds to your rating on the EDI-2 Answer Sheet. For example, if your rating for an item is OFTEN, you would circle the O for that item on the Answer Sheet.

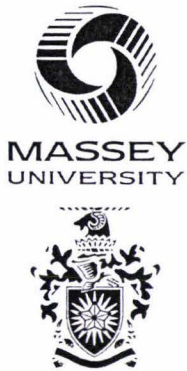
Respond to all of the items, making sure that you circle the letter for the rating that is true about you. **DO NOT ERASE!** If you need to change an answer, make an "X" through the incorrect letter and then circle the correct one.

1. I eat sweets and carbohydrates without feeling nervous.
2. I think that my stomach is too big.
3. I wish that I could return to the security of childhood.
4. I eat when I am upset.
5. I stuff myself with food.
6. I wish that I could be younger.
7. I think about dieting.
8. I get frightened when my feelings are too strong.
9. I think that my thighs are too large.
10. I feel ineffective as a person.
11. I feel extremely guilty after overeating.
12. I think that my stomach is just the right size.
13. Only outstanding performance is good enough in my family.
14. The happiest time in life is when you are a child.
15. I am open about my feelings.
16. I am terrified of gaining weight.
17. I trust others.
18. I feel alone in the world.
19. I feel satisfied with the shape of my body.
20. I feel generally in control of things in my life.
21. I get confused about what emotion I am feeling.
22. I would rather be an adult than a child.
23. I can communicate with others easily.
24. I wish I were someone else.
25. I exaggerate or magnify the importance of weight.
26. I can clearly identify what emotion I am feeling.
27. I feel inadequate.
28. I have gone on eating binges where I felt that I could not stop.
29. As a child, I tried very hard to avoid disappointing my parents and teachers.
30. I have close relationships.
31. I like the shape of my buttocks.
32. I am preoccupied with the desire to be thinner.
33. I don't know what's going on inside me.
34. I have trouble expressing my emotions to others.
35. The demands of adulthood are too great.
36. I hate being less than best at things.
37. I feel secure about myself.

38. I think about bingeing (overeating).
39. I feel happy that I am not a child anymore.
40. I get confused as to whether or not I am hungry.
41. I have a low opinion of myself.
42. I feel that I can achieve my standards.
43. My parents have expected excellence of me.
44. I worry that my feelings will get out of control.
45. I think my hips are too big.
46. I eat moderately in front of others and stuff myself when they're gone.
47. I feel bloated after eating a normal meal.
48. I feel that people are happiest when they are children.
49. If I gain a pound, I worry that I will keep gaining.
50. I feel that I am a worthwhile person.
51. When I am upset, I don't know if I am sad, frightened, or angry.
52. I feel that I must do things perfectly or not do them at all.
53. I have the thought of trying to vomit in order to lose weight.
54. I need to keep people at a certain distance (feel uncomfortable if someone tries to get too close).
55. I think that my thighs are just the right size.
56. I feel empty inside (emotionally).
57. I can talk about personal thoughts or feelings.
58. The best years of your life are when you become an adult.
59. I think my buttocks are too large.
60. I have feelings I can't quite identify.
61. I eat or drink in secrecy.
62. I think that my hips are just the right size.
63. I have extremely high goals.
64. When I am upset, I worry that I will start eating.
65. People I really like end up disappointing me.
66. I am ashamed of my human weaknesses.
67. Other people would say that I am emotionally unstable.
68. I would like to be in total control of my bodily urges.
69. I feel relaxed in most group situations.
70. I say things impulsively that I regret having said.
71. I go out of my way to experience pleasure.
72. I have to be careful of my tendency to abuse drugs.
73. I am outgoing with most people.
74. I feel trapped in relationships.
75. Self-denial makes me feel stronger spiritually.
76. People understand my real problems.
77. I can't get strange thoughts out of my head.
78. Eating for pleasure is a sign of moral weakness.
79. I am prone to outbursts of anger or rage.
80. I feel that people give me the credit I deserve.
81. I have to be careful of my tendency to abuse alcohol.
82. I believe that relaxing is simply a waste of time.
83. Others would say that I get irritated easily.
84. I feel like I am losing out everywhere.

- 85. I experience marked mood shifts.
- 86. I am embarrassed by my bodily urges.
- 87. I would rather spend time by myself than with others.
- 88. Suffering makes you a better person.
- 89. I know that people love me.
- 90. I feel like I must hurt myself or others.
- 91. I feel that I really know who I am.

Eating Habits Study
Consent Form



I have read the Information Sheet for this study and have had the details of the study explained to me. My questions about the study have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I have the right to withdraw from the study at any time and to decline to answer any particular questions in the study. I agree to provide information to the researcher on the understanding that it is completely confidential.

I would like to participate in section two of this study as outlined in the information sheet.

NAME: _____

AGE: _____

SIGNED: _____

PHONE: _____

TIME TO CALL: _____