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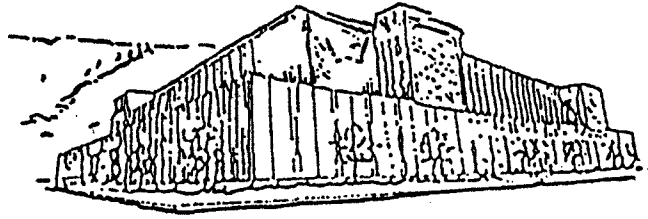
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Dietary Restraint and Body Dissatisfaction

by

Linda J. Schrader

B.S., University of Oregon, 1989

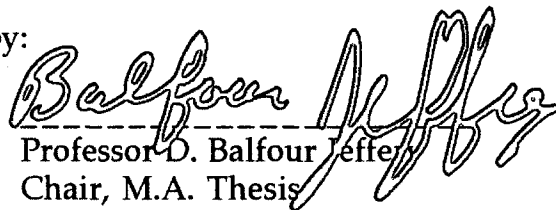
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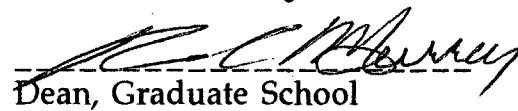
Master of Arts

UNIVERSITY OF MONTANA

1995

Approved by:


Professor D. Balfour Jeffrey
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Dean, Graduate School

May 16, 1995
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Abstract

Schrader, Linda J., May, 1995

Dietary Restraint and Body Dissatisfaction

Director: D. Balfour Jeffery, Ph.D. 

This study examined the variable of body dissatisfaction in conjunction with dietary restraint in an effort to address one mediator that might account for individual differences in consumption in the restraint research. The Revised Restraint Scale and the Body Dissatisfaction subscale of the Eating Disorder Inventory were administered to 498 women, and then a median split was performed on both scores, creating four groups: LL = low RRS/low BDS, LH = Low RRS/high BDS, HL = high RRS/low BDS, and HH= high RRS/high BDS subjects. Normal weight subjects were contacted by phone and invited to participate in a "Temperature and Taste" experiment which was actually the standard restraint research ice cream taste test. They were unaware that this was connected to the above measures. A 2x2x2 ANOVA on the grams of ice cream consumed was performed on the 117 subjects used in the final analysis. The significant main effects of both preload ($p=.03$) and body dissatisfaction ($p=.012$) suggest consistently restrictive effects upon consumption, such that persons who received a preload or had high body dissatisfaction consumed less. The significant interaction between body dissatisfaction and restraint ($p=.040$), was such that the HL group consumed significantly more than the HH group. Thus, subjects with low restraint consumed similar amounts regardless of BDS, but subjects with high restraint ate significantly more if they had low BDS than if they had high BDS. A strong trend ($p=.055$) was noted for the two-way interaction between BDS and preload such that high BDS subjects ate less with a preload than without, but low BDS subjects ate similar amounts regardless of preload. This trend suggests that high body dissatisfaction may co-exist with current dieting or a "dieting mind-set," restricting consumption, similar to Lowe's (1993) formulation of current dieters who ate less if their diet was made salient with a preload. Rather than intensifying the classic eating patterns of restrained eaters, high body dissatisfaction appears to have a consistently restrictive influence on consumption, and thus it seems important to examine body dissatisfaction within the taste test paradigm.

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Chapter 1

Introduction

Overview

Dietary restraint theories attempt to explain the cognitive regulatory behaviors that dieting individuals engage in to control their food consumption. A great deal of research has been done on the concept of dietary restraint, and several other psychological and behavioral variables have been found to correlate highly with dietary restraint. Higher scores on eating disorder scales, higher levels of depression, lower self-esteem, and lower levels of satisfaction with one's body have been found to correlate with higher levels of restraint. A limited body of research exists that examines the relationship between dietary restraint and dissatisfaction with one's body. Correlational studies have determined that dissatisfaction with one's body has been found to correlate with greater severity of eating disorder symptomology, and with higher levels of restraint (Weidel and Dodd, 1983), but the interactions between these constructs have not been explored. The goal of the current study is to explore the possible interaction between level of restraint and body dissatisfaction. To provide a theoretical background for the current study, the review of the literature will first cover theory development and measurement issues of dietary restraint, and then of body dissatisfaction, and lastly, research examining the relationship between the two will be reviewed.

Dietary Restraint

Background

Dietary restraint theories were originally developed to explain the differences between obese and normal weight persons with respect to eating behaviors, and originated in response to theories of obesity put forth by Schacter (1968, 1971) and Nisbett (1972). Schacter's externality theory of obesity (1968, 1971) purports that the eating behavior of obese individuals is influenced more by external food cues-- such as the sight and smell of food-- than the consumption of non-obese persons, who eat in response to internal cues such as gastric contractions. An additional theory called the "set-point theory" (Nisbett, 1972) suggested that obese persons have a higher biological set-point for natural weight, and in trying to attain a culturally preferred lower weight, they are likely to be in a constant state of food deprivation and below their biological set-point. This theorized deprivation state is hypothesized to cause them to be more sensitive to external food cues.

Difficulties in defining and manipulating internal and external cues which have made comparisons difficult and a lack of empirical support of the above theories have caused researchers to question these theories, but researchers in this area seem to concur on three points. First, that there are fewer differences in the eating patterns of obese and normal persons than hypothesized (Spitzer and Rodin, 1981). Second, that the only consistent difference is that consumption in obese persons tends to be more affected by

palatability than in normal persons. Third, that Nesbitt's basic concept of a homeostatically determined set-point seems viable.

Influenced by the idea that dieting might have a profound effect on eating patterns, Herman and Mack (1975) developed the construct of "dietary restraint." Herman and Polivy (1980) extended the restraint theory, suggesting that a person's eating behavior is influenced by the physiological desire for food and cognitive efforts to resist that desire. A 10-item scale was developed to assess individual levels of restraint (Herman, Polivy, Pliner, Threlkeld & Munic, 1978). The contemporary version of that scale, the Revised Restraint Scale (see Appendix A) discriminates between persons who chronically diet and worry about what they eat, and persons who eat freely and are not concerned about resisting food.

Herman and Polivy (1984) further extended restraint theory by introducing the "boundary model" which suggests that an organism strives to stay within the "range of biological indifference," or "above aversive levels of hunger and below uncomfortable levels of satiety". Within this range food consumption is determined by psychosocial and cognitive variables rather than physiological needs. Dieters and non-dieters (restrained and unrestrained eaters) differ in two main ways. First, dieters seem to have a larger range in which non-physiological variables dictate eating, and second, dieters have a self-imposed "diet boundary" that exists within and towards the hunger side of this range. If restrained eaters consume a diet breaking meal

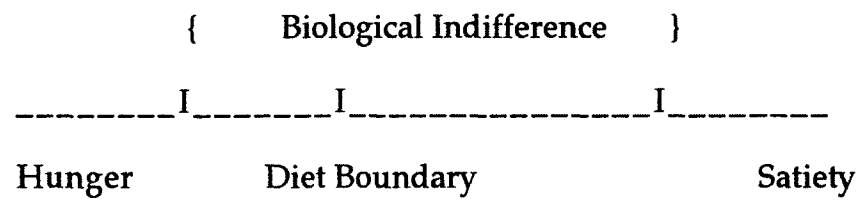
or treat that causes them to exceed their personal diet boundary, they may experience a release from or “disinhibition” of cognitive restraint. This is followed by “counterregulation” of eating behavior in which they consume more than they would have otherwise. The boundary model is not explanatory, but it does provide some useful parameters for describing eating behavior (see Figure 1, page 5).

The Revised Restraint Scale and Research Paradigm

Based on the assumption that restrained eaters will disinhibit and abandon their diets if they feel that they have overeaten, Herman and Mack (1975) devised a way to examine restrained and unrestrained eating which utilizes the Revised Restraint Scale (RRS), an experimental manipulation, and a deception. Subjects who have completed the RRS are classified as either restrained or unrestrained on the basis of a median split, and an equal number of subjects from both groups are randomly assigned to the experimental condition or the control condition. Subjects in the experimental condition are given a milk-shake “preload” prior to a bogus ice cream taste test, whereas subjects in the control condition are not. The amount of ice cream consumed is the dependent variable.

Results utilizing this paradigm follow a distinct and replicable pattern. Restrained eaters (dieters) who receive a preload tend to eat more in the taste test than restrained eaters who do not receive a preload. Conversely,

Figure 1
Boundary Model



(Ruderman, 1989)

unrestrained eaters (non-dieters) consume more when they have not received a preload. If interpreted in terms of the boundary model, these results suggest that the preload pushed the daily consumption for restrained eaters over the “diet-boundary,” causing them to disinhibit and “counterregulate” or consume more, but for unrestrained eaters the amount consumed was “regulated” by the satiety boundary (see Table 1, page 7).

In the Herman and Mack studies, all subjects were of normal weight, but several studies have been done in which obesity was the focus (Hibescher and Herman, 1977; Ruderman and Christensen, 1983). When obese persons are compared with restrained normal weight persons, the counterregulatory increase in consumption holds true for restrained eaters but not for obese persons. Obese persons ate either similar amounts in the preload- vs no-preload conditions, or actually ate less in the preload condition as would be expected of an unrestrained eater. This typifies the problems inherent in trying to equate restrained eaters and obese persons.

One psychometric elaboration on the RRS makes an effort to explain this phenomenon with obese subjects. Herman and Polivy (1979) divided the scale into two subscales on the basis of the face validity of the items, a “weight fluctuation” (WF) factor and a “concern with diet” (CD) factor. The CD factor is composed of items 1, 5, 6, 7, 8, and 9, and the WF factor is composed of items 2, 3, 4, and 10. Obese persons tend to score high on the WF factor, receiving an inflated restraint index that overestimates the likelihood that

Table 1
Previous Findings in Restraint Literature

	Restrained	Unrestrained
Preload	163g	119g
No Preload	97g	205g

(Herman and Mack, 1975)

they will counterregulate. The scale seems to be psychometrically sound for normal weight subjects, but further work needs to be done before it can be used with confidence to assess obese subjects.

Research Utilizing the Revised Restraint Scale

The construct of dietary restraint has been elaborated upon in numerous ways. In an effort to demonstrate that a major portion of the counterregulatory response is cognitive and not due to some physiological effect (ie., glucose levels), subjects' perceptions of the caloric content of the milkshake preload was manipulated (Polivy, 1976; Spencer & Fremouw, 1979). Although all of the preloads were identical, if told that the milkshake was high-calorie, the restrained eaters tended to consume more during the taste test than if told it was low-calorie. Unrestrained eaters responded in the reverse, eating somewhat less if told that the milkshake was high calorie. It was also found that a small pre-load sometimes failed to produce more consumption in dieters, theoretically because this did not push the consumption level over the diet boundary. A medium pre-load did produce more consumption, but a large pre-load tended to produce consumption similar to that of a medium pre-load, suggesting that even the dieters eventually responded to the natural satiety boundary.

In addition to examining the effect of preloads and cognitive manipulations, several studies have been done that examine the relationship

between mood and restraint, and its effect on consumption. In examining clinically depressed patients, restrained eaters reported a significant weight gain after the onset of depression and unrestrained eaters report a significant weight loss (Polivy and Herman, 1976). When mood was manipulated using a negative mood induction technique, restrained eaters ate significantly more than restrained eaters in a neutral mood, and unrestrained eaters ate slightly less when in a dysphoric mood (Baucom & Aiken, 1981; Ruderman, 1985). In a recent study by Smith & Jeffrey (1990), restrained subjects who experienced a temporary dysphoric mood (induced using the Velten mood induction technique and measured by the Multiple Adjective Checklist) ate significantly more crackers than the unrestrained eaters in the same condition.

There is also some evidence that chronic dieters have higher plasma levels of triglycerides than do unrestrained eaters, which may be the biochemical consequence of mild starvation incurred by dieting (Laessle, Tuschl, Kotthaus, & Pirke, 1989). When combined with the cognitive factors and a heightened responsiveness to mood, this physiological state could enhance the restrained eaters' susceptibility to overeat.

Current Issues in Restraint Research

There are several issues in dietary restraint research that have not been resolved. One of them is the descriptive rather than explanatory nature of the boundary model proposed by Herman and Polivy (1984) which leaves the

underlying mechanisms of disinhibition and counterregulation unknown.

A second concern is the interpretation and use of restraint status as a dichotomous variable as opposed to a continuous variable. Intuitively, it makes sense that people possess varying degrees of restraint and Stein (1988) found that coding dietary restraint as a continuous variable more accurately accounted for amount consumed in a taste test than did coding it as a dichotomous variable. Thirdly, the large within group variation of amount consumed in bogus taste tests has not been explained. In reporting the means of the various restraint-by-preload conditions group differences are demonstrated, but the restraint scale has not been very successful at predicting individual eating behavior (Charnock, 1989; Polivy, Heatherton, & Herman, 1988). By examining additional variables such as level of body dissatisfaction, the individual characteristics of restrained eaters and their subsequent eating behavior can be better understood. Lastly, although restrained eaters are often viewed as an analogue for the eating disordered population, the understanding of the relationship between restraint and the development of eating disorders is still quite limited. By examining the interaction between restraint and one of the key aspects of eating disordered persons, body dissatisfaction, some aspects of this relationship may be illuminated.

Body Dissatisfaction

Attitudinal and Perceptual Constructs of Body Image

Two constructs have been examined with respect to how people view their own bodies (Cash & Brown, 1987). The first construct, “perceptual” disturbance or body image distortion, refers to the inability to accurately assess the size of one’s body. The second is “attitudinal” or affective, and refers to the level of satisfaction or dissatisfaction one feels towards their body. There are several techniques used in studying the first construct, perceptual distortion: image marking, analogue scale, optical distortion, silhouette-card sorting, and kinesthetic techniques. It has been purported that distortion of size estimation is the underlying problem in eating disorders, but the results from studies attempting to demonstrate that eating disordered individuals significantly overestimate their size have been mixed and overall the data is inconclusive.

Hsu & Sobkiewicz (1991) suggest that the second construct, attitude towards one’s body, has greater relevance and more potential for research. Studies attempting to differentiate between normals and eating disordered individuals with regard to level of body dissatisfaction have been more consistent and conclusive than those which examine the perceptual component of body image. This study will focus on the second attitudinal construct, body dissatisfaction, for three reasons. First, it seems to be a more powerful and non-confounded discriminator between normal populations

and eating disordered populations, especially with bulimics (Hsu et al, 1991). Second, it seems to be a more simple and homogenous concept (Brodie & Slade, 1988). And third, it appears to be more closely tied to clinical issues. Though normal subjects also tend to want to be thinner and tend to be dissatisfied with their bodies, anorexics and bulimics do so to a significantly greater degree. Eating disordered “patients assess their physical dimensions accurately but they react to their bodies with extreme forms of disparagement” (Garner & Garfinkel, 1981).

The Cultural Backdrop of Body Dissatisfaction

Research pertaining to body dissatisfaction suggests that our culture’s growing emphasis on thinness has drastically affected how women feel about their bodies. In the last two decades, the Western culture’s ideal body shape has shifted from the voluptuous figure to the ultra-fit, ultra-slim shape. Examining how beauty pageant contestants compare to the average American woman over a twenty year spread is one concrete way to examine changes in cultural pressures to be thin. Garner, Garfinkel, Schwartz and Thompson (1980) examined beauty pageant contestants from 1959 and 1979 in terms of their percentage of average weights for American women. In 1959, Miss America Pageant winners weighed an average of 88% of the mean weight of normal females of the same height, suggesting that three decades ago there was already a trend for slimmer than normal figures to be considered

desirable. By 1979, pageant winners weighed an average of 82% of normal females, a significant decrease since 1959.

A more recent examination (Wiseman, Gray, Moismann, & Ahrens, 1992) of the weights and body measurements of these same groups found that from 1979 to 1988 Miss America contestants decreased significantly in weight and that Playboy centerfolds stayed at the same low weights found in the Garner et al (1980) study. A decrease in hip size was the only body measurement which decreased significantly in the period from 1979-1988. It is interesting to note that one of the essential features for anorexia nervosa presented in the Diagnostic Statistical Manual III-Revised is body weight that is 15% or more below the expected body weight for one's particular size and height, and the women that are being hailed as the ideal American women usually meet this criteria. In addition, since 1970, pageant winners have weighed significantly less than other contestants. In addition, the number of diet articles in popular women's magazines doubled during that time. In contrast to this evolution of a thinner culturally ideal body shape, the average female became heavier from 1959 to 1979 (Garner et al, 1980).

This shifting cultural standard applies to women far more than it does to men. In studying non-eating disordered persons, Dolan, Birtchnell and Hubert (1987) found that 84% of women and 52% of men wish to weigh less, though of those persons within 10% of the MPMW (mean population matched weight), men wished to be 1.65 lbs heavier and women wished to be

7.17 lbs less. Women in this study who were most satisfied with their weight were well below the MPMW. The MPMW is the midpoint of the "medium-size frame" desirable weight limits for a specific height on the 1979 Metropolitan Life Insurance Height and Weight Table (Metropolitan Life Insurance Statistical Bulletin, 1983).

The extremely pejorative view of fat in our society may serve to exacerbate "fear of fat" and the pursuit of thinness so pervasive among women today. Those women who have most strongly introjected these views may be most at risk for developing eating disorders. Striegel-Moore et al (1986) suggest that women who perceive themselves to be fat have a self-schema in which body weight is a central component and that any experience that gives rise to self evaluation leads to evaluation of body and weight. Garner and Garfinkel (1981) suggest that body dissatisfaction in anorexics may be subsumed under a more general concept of self-esteem, such that "body fatness becomes an index by which non-physical qualities are evaluated."

When comparisons were made between adolescents of different ethnic groups using the EDI and the Bulimia test, Native American female adolescents were found to be significantly higher than whites or hispanics in number of binge eating episodes, induced vomiting episodes, endorsement of the statements "always terrified of gaining weight" and "never satisfied with body shape" (Smith & Krejci, 1991). Native Americans are more often above the weight norm, and thus are less likely to fit the our culture's thin ideal.

Measurement and Findings in Body Dissatisfaction

Numerous measures for assessing body satisfaction exist, and virtually all are pencil and paper self-report instruments. These include the Body Cathexis Scale (Secord and Jourard, 1953), the Body Parts Satisfaction Scale (Berscheid, Walster and Hohnstedt, 1973), the Negative Self Image Scale (Nash, 1978), the Body Esteem Scale (Mendelsen & White, 1985), and the Body Satisfaction Scale on the Eating Disorders Inventory (Garner et al, 1983). The Body Satisfaction Scale on the Eating Disorders Inventory (EDI) is the most widely used scale and seems to be the most valid and reliable scale, and thus will be used as the measure of body satisfaction in this study.

One of the first instruments designed to measure body satisfaction was the Body Cathexis Scale. This scale, developed in 1953 by Secord and Jourard, asks respondents to rate the degree of feelings of satisfaction or dissatisfaction with 46 various parts or processes of the body (hair, face, hands, thighs, back, breathing, sexual activities, etc.) Subjects rate body parts on a 5-point Likert scale with 1= "have strong feelings about and would like to change," 3= "neutral," to 5= "feel fortunate." Women presumably cathect more to their body parts and processes, as they used more ratings at the extreme ends of the scale, whereas men used more neutral ratings. When compared with Scottish women on the Body Cathexis Scale, American women differentiated more between body parts and processes, seeming to possess a less unified impression of their body. Women from both cultures gave the lowest rating

to the hips, buttocks, thighs-- areas that are most likely to be characteristic of a "womanly" shape.

Fabian and Thompson found that self-esteem, depression, eating disturbance and body-esteem were significantly correlated ($p < .01$). Using only normal weight subjects, Cullari & Trubilla (1989) administered the EDI and the Tennessee Self-Concept Scale, took measures of body image distortion, and also had subjects view nine somatotype drawings. Fifty percent of the subjects overestimated their own body size, but not those of observers, indicating that these subjects do not have pervasive perceptual inaccuracy.

Brodie and Slade (1988) gave 100 female volunteers three measures of adiposity or percentage body-fat, two measures of body size estimation, the Body Satisfaction Scale (a 16 item self report measure with three factors-- general body satisfaction, head parts satisfaction, and body-parts satisfaction), and several other psychological measures (the Eating Attitudes Test, the SCANS, and the Beck Depression Inventory). Brodie and Slade found that the more "over-fat" a person was, the more dissatisfied with her body she was and the more she wanted to change it. Fatter individuals did not show less accuracy in their body size estimation. In addition, subject's scores on the perceptual accuracy measures did not correlate with the other psychological measures, whereas the body dissatisfaction measures are found to be highly correlated with these other measures, such as level of depression on the BDI.

Dissatisfaction with body image was the most potent predictor in a regression equation predicting relapse in an eating disordered population (Freeman, Beach, Davis and Solyom, 1985). Also, two studies using the Body Cathexis Scale found that bulimics' body satisfaction improved after treatment (Huon and Brown, 1985; Ordman and Kirschenbaum, 1985).

The Eating Disorder Inventory

The instrument which will be used in this study is the Eating Disorders Inventory or EDI (Garner et al, 1983). This 64-item self-report instrument was developed to assess the cognitive and behavioral characteristics of patients with anorexia nervosa and bulimia, and to aid in differentiating between various subtypes of persons with eating disorders. Eight clinically derived subscales have been constructed and are presented below with a description of the intended content of each scale.

- (1) Drive for Thinness: excessive concern with dieting, weight, and pursuit of thinness.
- (2) Bulimia: tendency towards episodes of uncontrollable overeating which may be followed by the impulse to purge through vomiting and/or laxatives.
- (3) Body Dissatisfaction: the belief that parts of the body associated with shape change at puberty (hips, thighs, and buttocks) are too large and are unattractive.
- (4) Ineffectiveness: feelings of inadequacy, worthlessness, and lack of control in one's life.
- (5) Perfectionism: excessive expectations for one's own achievement.
- (6) Interpersonal Distrust: a sense of alienation and reluctance to form close relationships.
- (7) Interoceptive Awareness: a lack of confidence in one's ability to accurately identify emotions and sensations of hunger.
- (8) Maturity Fears: a wish to avoid the demands of adulthood and retreat to the security of childhood.

The EDI was originally tested using 113 anorexia nervosa patients who averaged 20% below their expected weight norms, and 577 female university students. The clarity and replicability of the subscales were evaluated by Welch, Hall and Walkey in 1988. Using the FACTOREP procedure (Walkey, 1983), three factors which utilize 44 of the items on the EDI were found to be internally consistent. The first factor was comprised of most of the items in the Drive for Thinness, Bulimia and Body Dissatisfaction subscales (utilizing items 2, 4, 5, 7, 9, 11, 12, 16, 19, 25, 28, 31, 32, 38, 45, 49, 53, 55, 59, and 62), and may focus on a concern with shape, weight and eating. A second replicable factor that may tap in to self-esteem was formed from the Ineffectiveness and Interpersonal Distrust subscales. The third factor was comprised of those items in the Perfectionism subscale, and seemed to measure the intended construct. Neither the Interoceptive Awareness nor the Maturity Fears subscales demonstrated any clear, replicable pattern of loadings.

In this study, all of the following groups of women scored quite high on the body dissatisfaction scale, with bulimic patients scoring highest, then obese controls, then anorexic restrictor patients and then restrained controls at normal weight. Conversely, the unrestrained control subjects scored very low on the body dissatisfaction scale (Welch et al, 1988).

Current Measurement Issues

The interaction between body weight and body dissatisfaction had not

been controlled for until recently when Garner, Garner and Van Egeren (1992) developed a method for systematically adjusting the Body Dissatisfaction score according to percentage overweight or underweight to reflect the greater valence of high body dissatisfaction at progressively lower weights. Women who are above the weight that is considered normal for their height are the most dissatisfied with their bodies (Huenemann, Shapiro, Hampton & Mitchell, 1966). Their argument is that higher body dissatisfaction at higher weights reflects a response to cultural demands, and, though significant clinically, is not as much of an indication of pathology as are high levels of body dissatisfaction at lower weights. Normal weight was determined using the Matched Population Mean Weight (MPMW) with 1979 Metropolitan Life Insurance Weight Norms (Metro-politan Life Insurance Statistical Bulletin, 1983). The MPMW is the midpoint of the "medium-size frame" desirable weight limits for a specific height on the 1979 Metropolitan Life Insurance Height and Weight Table (1983). By examining the linear regression of Body Satisfaction on body weight and the correlation between the two variables ($r=.39$), and determining that body weight accounts for 4% to 15% of the variation in Body Dissatisfaction scores, Garner et al determined that for every five units of increase in weight there is an increase of one unit in Body Dissatisfaction. When this adjustment is made, the regression line is flat and the correlation is .0211. Table 2 (see page 20) shows the adjustment scale of the Body Illusion Index.

Table 2
Body Illusion Index Adjustment Scale
Adjustment to the Eating Disorder Inventory Body Dissatisfaction Score

Weight (% of MPMW)	Add to raw Body Dissatisfaction Score
>120	0
115-119	1
110-114	2
105-109	3
100-104	4
95-99	5
90-94	6
85-89	7
80-84	8
75-79	9
70-74	10
65-69	11
60-64	12
55-59	13
50-54	14
<50	15

(Garner, Garner, & Van Egeren, 1992)

Restraint and Body Dissatisfaction

Most studies that measure dietary restraint and body dissatisfaction do not analyze the interaction between the two constructs and are concerned instead with differentiating between groups of eating disordered individuals and controls. Still, a brief review of several studies that include both constructs will help to provide an arena in which the conceptualization of the relationship between restraint and body dissatisfaction can be explored.

When entered in to a multiple regression with other measures such as depression, self-esteem, social anxiety, desired weight and actual weight, body dissatisfaction was the most powerful predictor of level of restraint for high school women (Rosen, Gross, and Vara, 1987). Body Dissatisfaction and Drive for Thinness were the only scales on the EDI that were significantly predictive of the development of eating disorders in ballet students in a 2 year follow-up (Garner, Garfinkel, Rockert & Olmstead, 1987).

One study which directly reports upon the relationship between dietary restraint and body dissatisfaction used the Negative Self-Image scale (Nash, 1978) to assess negative body image in college-aged males and females. In addition, subjects completed the Restraint Scale (Herman et al, 1978), and several other personality scales. Restraint and negative body image were significantly correlated ($r=.56, p<.01$), with restrained eaters tending to report a more negative body self-image (Weidel and Dodd, 1983). Also highly correlated with these two variables was the percentage ideal body weight

(with $r=.48$ for restraint and $r= .39$ for body image, both $p< .01$). In this analysis, persons at higher levels above their idealized weight were more likely to score high on restraint and have a poorer body image. Several other studies have found a high correlation between restraint and body dissatisfaction (Rosen, 1987; Eldredge, Wilson, & Whaley, 1990).

Using the RRS and the Body Attitudes Scale in addition to six other personality and attitudinal measures, Katzman and Wolchik (1984) found that bulimics were more depressed, had lower self-esteem, higher self-expectations, greater restraint scores, and poorer body image.

In another study with a very small number of subjects (Rossiter, Wilson, & Goldstein, 1989), 10 bulimia patients were compared with 20 female undergraduates. Subjects were split into restrained and unrestrained groups on several measures. Bulimics and restrained eaters were equally dissatisfied with their weights and bodies, equally preoccupied with food, and equally restrained in their eating. Yet, bulimics were higher than restrained eaters, (who were higher than unrestrained eaters), on the total scores of the Three Factor Eating Questionnaire (a version of the Revised Restraint Scale), and the EDI. This suggests a continuum in which greater restraint and concern about dieting issues may lead to overeating in disinhibiting situations. No analysis of the relationship between body dissatisfaction and restraint was made, however.

Purpose and Hypothesis

Research suggests that chronic dieters, or restrained eaters, are more at risk for development of a clinical eating disorder than are unrestrained eaters. It has also been found that body dissatisfaction, though common for the majority of women in America, is more extreme in persons with eating disorders. A great deal of research has been done on the concept of dietary restraint, but little research has examined the interaction between dietary restraint and body dissatisfaction. Examining the relationship between these two variables in the eating behavior of a “normal” analogue population will improve the understanding of eating disordered individuals and of chronic dieters.

The purpose of this study is to explore the interaction between dietary restraint and body satisfaction. Dietary restraint is described as the level to which a person places controls upon their consumption of food. For the purpose of this study, high restraint will be defined as scoring above the median on the RRS, and low restraint will be defined as scoring below the median on the RRS. High scores on the RRS reflect a greater concern with dieting, and a preoccupation with weight and food. Body dissatisfaction is defined as the dislike or lack of acceptance of one’s body or parts of one’s body. High body dissatisfaction will be defined in this study as scoring above the median on the Body Dissatisfaction subscale of the EDI. Low body dissatisfaction will be defined as scoring below the median on this subscale.

Persons with high body dissatisfaction scores (BDS) are likely to feel that the shape of their stomach, buttocks, thighs and total body are not acceptable.

The structure of this study will closely follow the methods used in prior restraint studies to allow for comparison (see Figure 2, page 25).

The research questions posed are: 1) "Do level of restraint and body satisfaction interact to influence amount of food consumed?" and 2) "If so how is this interaction affected by a 'diet-breaking' pre-load?"

It is hypothesized that the pre-load manipulation and the restraint variable will interact in a manner consistent in earlier studies with unrestrained eaters in the no preload condition consuming the most in the taste test, then restrained eaters in the preload condition, then restrained eaters in the no preload condition, and lastly unrestrained eaters who consume a preload.

A three way interaction between restraint, body dissatisfaction and preload condition is expected such that: a) those restrained eaters with high body dissatisfaction will consume a significantly larger amount than those with low body dissatisfaction in the pre-load condition, whereas b) restrained eaters with high body dissatisfaction will consume less than the restrained eaters with low body dissatisfaction in the no preload condition. In addition, it is expected that the RRS score and the BDS will be positively correlated (see Figure 3, page 26).

Figure 2
Experimental Design

n per cell = 14-15, total n = 117

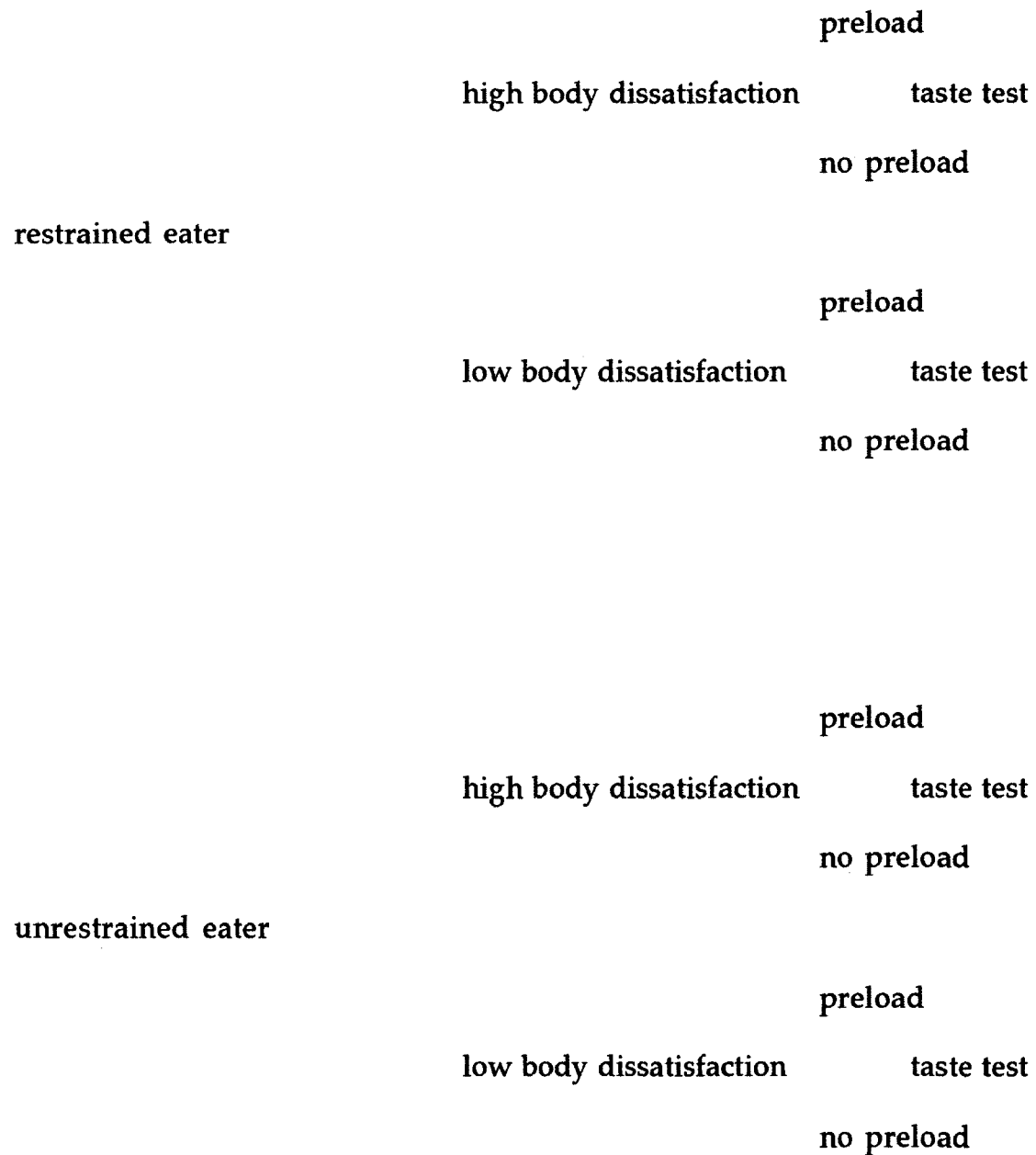
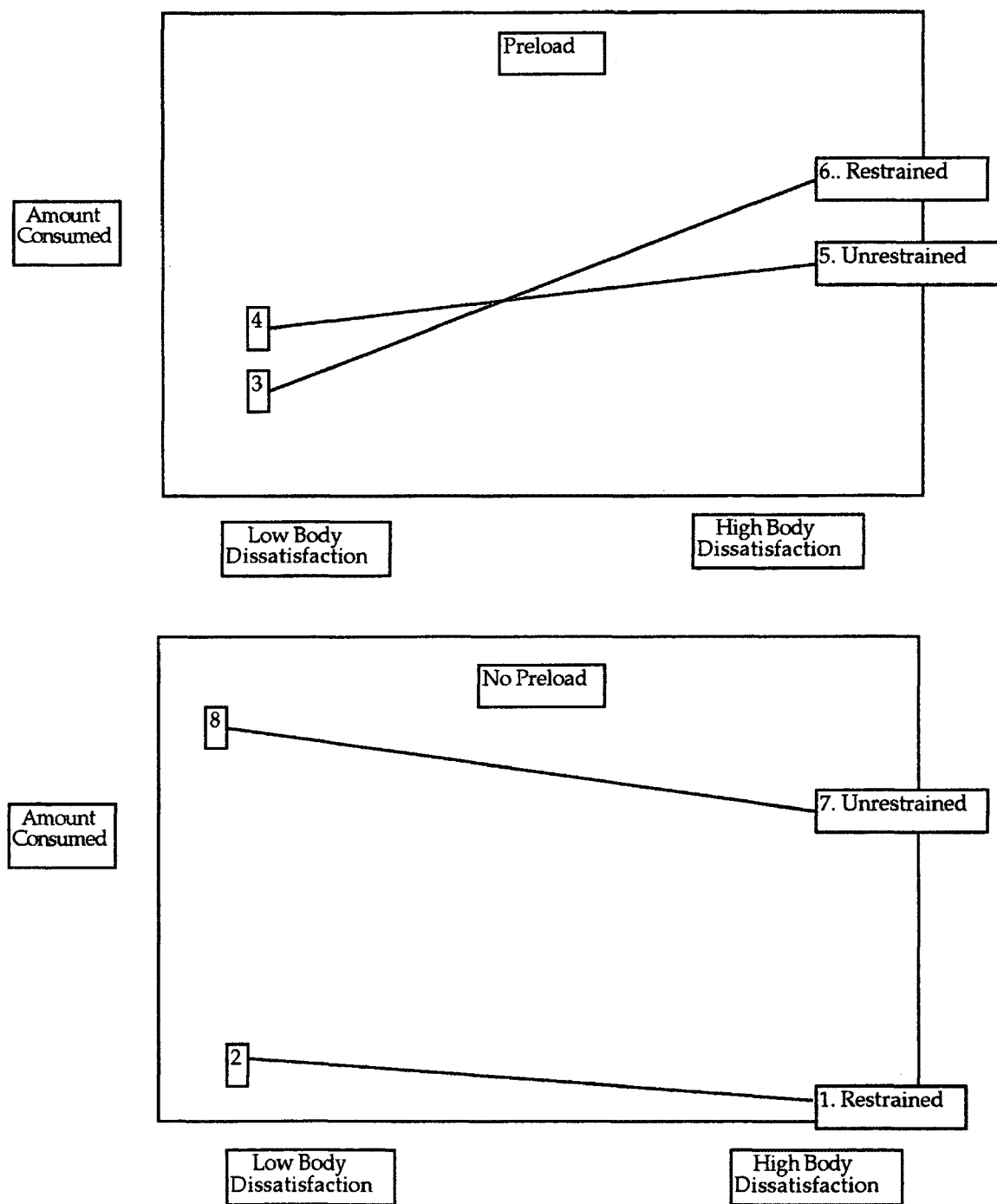


Figure 3

Hypothesized Levels of Consumption

(Numbers 1-8 correspond to hypothesized order of levels of consumption)



Chapter 2

Method

Overview

Female subjects at the University of Montana were administered a brief demographic questionnaire, the Revised Restraint Scale (RRS; Herman, Polivy, Pliner, Threlkeld and Muncie, 1978), the Eating Disorders Scale for its Body Dissatisfaction subscale (Garner et al, 1983), and a developmental questionnaire (Schrader, 1993) during two Psychology 100 group screening procedures in the fall term of 1993 and the spring term of 1994. A median split was performed on both scales, dividing the subjects into four groups; high RRS/high BDS, high RRS/low BDS, low RRS/high BDS, and low RRS/low BDS. Normal weight subjects with complete data were recruited by phone from each of these four groups to participate in the laboratory segment of the study. These groups were divided further with half of each group receiving a preload consisting of a milkshake, and half receiving no pre-load, following the procedures used by Polivy, et al (1988). All subjects then participated in a hypothetical taste test with the dependent measure being the amount of ice cream eaten during the taste test. Subjects were then weighed and measured, given a second hunger scale, debriefed, and then released.

Subjects

One-hundred-seventeen female undergraduate students at the University of Montana served as subjects (14-15 per treatment cell). Only those subjects who were within 15% of their normative body weight participated in the laboratory segment of the study in order to avoid counterregulation problems encountered in previous studies with overweight subjects (Rudderman & Wilson, 1979; Smith, 1990). Subjects with lactose intolerance, an allergy to chocolate, diabetes, or hypoglycemia were identified during the phone contact and were not invited to participate in the laboratory segment. All subjects received experimental credit required by their introductory psychology course for their participation. They were tested individually by female experimenters who were blind to their restraint status and body dissatisfaction level. Subjects were asked to refrain from eating for two hours prior to the laboratory segment, and completed a brief hunger scale (Preston, 1982) prior to the taste test to assess their hunger level. Those subjects who reported that they'd eaten in the two hours prior to the experiment were rescheduled.

Measures

Revised Restraint Scale = RRS (Herman et al., 1978): When used with normal weight subjects this 10 item scale has been found to be both reliable and valid. Test-re-test stability has been found to be .93 (Kickham & Gayton,

1977), and internal consistency has been found to high, with coefficient alphas of .78 to .86 reported with a normal weight sample (Ruderman, 1983; Allison, Kalinsky & Gorman, 1992). Scores for the total RRS as well as the two factors Concern with Dieting (CD) and Weight Fluctuation (WF) were calculated and analyzed. Questions #11 and #12 have been added as # 11 has been shown to be highly predictive of the amount consumed after a preload (Stein, 1988). This questionnaire were administered during the screening procedure. See Appendix A.

Eating Disorder Inventory = EDI (Garner et al, 1983): The EDI is a 64 item, self-report, multi-scale measure designed for the assessment of the psychological and behavioral traits common in eating disorders. Reliability, and convergent and discriminant validity have been established for all subscales. The Body Dissatisfaction subscale, one of eight subscales, provided the score for the body satisfaction variable. Authors report reliability coefficients (Standardized Cronbach's Alpha) at .91 for control samples (non-eating disorder). The Body Illusion Index was used to eliminate the effects of relative weight on Body Dissatisfaction scores (BDS). This statistically derived index addresses the different meanings and clinical significance that body dissatisfaction implies for individuals at different weights (Garner et al, 1992). See Appendix B.

Demographic Questionnaire (Ridgway, 1993): A brief demographic questionnaire was administered during the screening session. This

questionnaire gathered information about name, age, height, weight, and phone number for contact and screening purposes. See Appendix C.

Developmental Questionnaire =DQ; (Schrader, 1993): This questionnaire, also administered during the screening, inquired about childhood body shape, age at menarche and feelings about body shape and menarche. This pilot instrument will be used for future instrument development and analysis. See Appendix D.

Hunger Scale(s); (Preston, 1982): These brief measures assesses the subject's level of hunger. A pre-experimental version was administered just prior to the taste test to eliminate persons who had eaten within two hours before the test, and a post-experimental version was given immediately after the procedure. See Appendices E and F.

Procedures

In the fall term of 1993 and the spring term of 1994, 498 female undergraduates at the University of Montana who were enrolled in introductory psychology were administered a screening battery consisting of the RRS, the EDI (containing the BDS), the Demographic Questionnaire, and the Developmental Questionnaire. Subjects whose responses on the demographic form indicated that they were more than 15% overweight with respect to the 1979 Metropolitan Life Insurance weight norms for women (Metropolitan Life Insurance Statistical Bulletin, 1983) were discarded from

the subject pool (see Appendix G). These criteria were chosen for several reasons. First, the 1979 norms are more applicable to women today as they reflect the increase in average weights for women in the past 30 years. Second, 15% was chosen as the cut-off point because this is the cut-off used in the majority of restraint studies, and it provides a more stringent protection against inflated Weight Fluctuation factor scores than a 20% cut-off. Third, in order to utilize the Body Illusion Index it was necessary to use the 1979 weight norms.

It is important to note that the initial BDS's used to group subjects for the taste test utilized the weight reported by subjects at the screening to determine the Body Illusion Index. In the final groupings and in the data analysis, the subject's actual weight as measured at the time of the screening was used to determine the Body Illusion Index, resulting in an adjusted body dissatisfaction score which is still labeled the BDS.

A median split was performed for the data from the RRS and the BDS and those subjects with complete data who were not on the median were separated into one of the following four groups were selected: 1) LL= low restraint subjects/low body satisfaction, 2) LH= low restraint subjects/high body satisfaction, 3) HL= high restraint subjects/low body satisfaction, and 4) HH= high restrained subjects/high body satisfaction. These 173 subjects were then contacted via phone by a female experimenter using the phone contact script (see Appendix J). They were asked to participate in a study examining

“the relationship between temperature and taste.” If they agreed to participate, a time was arranged for them to participate and they were asked to refrain from eating for two hours prior to the study. A selection of taste test times were offered, and subjects were encouraged to schedule themselves for a time that allowed them to maintain their usual meal schedule.

Appointments for the lab segment were made at either 10:00am, 10:45am, 11:30am, 12:15am, 2:00pm, 2:45pm, 3:30pm, or 4:15pm as these are times that are not normally considered meal times.

Upon arrival, the subject was greeted by a female experimenter and shown to the “taste test” lab. The experimenter was blind to the subject’s scores on the scales and utilized a script for the interaction to standardize as much as possible the administration of the taste test (Appendix K). The female experimenters were of normal weight and wore white lab coats to obscure their body shape to reduce the effect that an underweight or overweight experimenter might have on the subject’s consumption. The subject read and signed an informed consent form (Appendix H). Next they completed a brief hunger scale which asked them when and what they last ate and to rate their level of current hunger on the Hunger scale (Appendix E). Subjects who reported that they had eaten were rescheduled.

Subjects were told that the experiment was concerned with effects of temperature on taste and were randomly assigned to either the “cold mouth” condition or the control condition. The “cold mouth” condition was

achieved by having the subject consume a 15-ounce freshly made chocolate milkshake. This was actually the preload. Half of the subjects in each median split group consumed a preload and half did not. The experimenter informed the subject that they need not hurry, but that they should drink the milkshake at a steady rate. The experimenter noted the time it took the subject to consume the milkshake, and the one subject who took more than five minutes to do so was eliminated from the study. This was done to reduce the chance that metabolic responses to glucose would be different for some subjects.

After this point in the procedure, all subjects were treated identically. After the preload was consumed for subjects in that condition, or after the no-preload subjects had signed the consent form, the subjects were given three large bowls each containing 1,100 grams of three flavors of ice cream (chocolate, vanilla and strawberry), serving spoons, three individual tasting cups and spoons, and three rating forms. The rating forms asked subjects to rate the ice cream in terms of how good, sweet, rich, thick, and flavorful it was. Subjects were instructed to serve the ice cream into their own tasting cups with the serving spoons and to taste the ice cream using their tasting spoons. They were asked to rate the three flavors according to the following instructions:

“The goal of the study is to determine the effect that temperature has on taste, and to obtain prospective consumers’ opinions regarding ice cream tastes under varying conditions, in a setting free of marketing gimmicks, such as advertisements, packaging, etc. You are in the (control/ cold mouth)

condition. Now, this study is concerned with peoples' sensitivity and liking for different kinds of tastes. Please taste and rate each of these three flavors of ice cream using these three rating forms.

Please use these serving spoons to dish out the ice cream, and these tasting spoons to taste. Take as much as you need to be sure of your rating before going on the next flavor. Fill out all of the ratings for the first flavor before tasting any of the next one. Please do not change a rating after having tasted another flavor-- once you have tasted a new one you may not go back and change any ratings of another flavor. Please rate the three flavors in the order in which they are laid out in front of you so that the tastes don't get mixed up. Oh, also -- we'll be throwing away any leftover ice cream at the end of the day, so feel free to eat as much as you like after you're done rating the flavors. It is important, however, that you don't go back and change any of your ratings. I'll be back in about 10 minutes." (from Polivy et al, 1988)

After ten minutes the experimenter returned, removed the bowls of ice cream, took the subjects rating sheets, and gave the subject another Hunger Scale (Appendix F). The subject was then weighed and measured, was debriefed about the taste test and was given information about the description of the study which occurred in April of 1994, after all subjects had completed the experimental session. After the subject left, the experimenter weighed the remaining ice cream to determine the amount of each flavor consumed by that subject, and recorded these amounts and the actual weight and height of the subject. The complete script and instructions for the experimenters is provided in Appendix K .

Chapter 3

Results

Overview

A total of 498 female subjects from the introductory psychology subject pool at the University of Montana were screened during two mass screening sessions in the Fall of 1993 and Spring term of 1994, from November through March. One-hundred-twenty-nine of these subjects were eliminated from the subject pool because their weight deviated more than 15 percent above or below the MPMW for their height. An additional 66 were eliminated because their score on the RRRS or the BDS fell on the median, and 39 more were eliminated because they supplied incomplete information. On the basis of their scores on the RRS and on the BDS, which utilized the subjects' actual weights to adjust the Body Dissatisfaction scale, the subjects were grouped into four groups: LL = low RRS/low BDS, LH = Low RRS/high BDS, HL = high RRS/low BDS, and HH = high RRS/high BDS.

Of the remaining 264 subjects, 173 were contacted by phone and participated in the experimental phase of the study. Thirty-two were dropped from the study because they weighed more than they'd indicated during the screening and exceeded the MPMW for their height, and one subject was dropped because she reported having dental work just prior to the experimental session that made eating ice cream painful. Two subjects

indicated that they'd eaten less than two hours before the experimental session and did not attend their rescheduled appointments, one took more than five minutes to consume the preload, and seventeen additional subjects were dropped by a random procedure to balance the number of subjects per cell as closely as possible. The random procedure was as follows: subjects in each cell were arranged in order of the last four digits of their social security number and then a coin was tossed for each subject to determine if that subject would be discarded until the proper number of subjects was discarded. Eleven were dropped from the LL group, two from the LH group, one from the HL group, and three were dropped from the HH group, for a total of 120 subjects, thirty in each group. After the initial BDS was recalculated using the actual weights, three subjects fell on the median for this actual BDS, and so were discarded. After the initial analysis, it was discovered that one LH subject's high consumption of ice cream made this person a statistical outlier as her consumption was more than three standard deviations above the mean. She was removed from the analysis, and was replaced with another randomly selected LH subject. A total of 117 subjects were thus included in the final data analysis, 14 or 15 in each cell.

Subject Characteristics

The subject characteristics are reported in Table 3 (see next page).

Table 3.
Means and Standard Deviation Scores
for the Current Study and Comparable Studies

<u>Variable</u>	<u>Mean</u>	<u>SD</u>	<u>Range</u>
Eating Disorder Inventory (current study) (Garner et al, 1993)	38.55 38.4	24.16 10.1	3 - 127
Body Disatisfaction Scale (current study) (Garner et al, 1993)	12.69 12.2	8.44 8.3	0 - 27
BDS revised w/ reported weights (current study)	17.81	8.35	3 - 33
BDS revised w/ actual weights (current study)	17.02	8.21	2 - 33
Revised BDS (Garner et al, 1993)	16.4	7.5	
Body Illusion Index w/ reported weights (current)	5.10	1.32	2 - 7
Body Illusion Index with actual weights (current)	4.32	1.49	1 - 7
Revised Restraint Scale-RRS (current study) (Smith, 1990)	14.99 14.62	5.39 5.37	3 - 29 0 - 27
(Ridgeway, 1994)	14.8	6.30	1-33
(Duchman, 1989)	11.47	3.60	--
RRS- Concern For Dieting (current study) (Smith, 1990)	9.12 8.59	3.80 2.65	2 - 18 --
RRS- Weight Fluctuation (current study) (Smith, 1990)	5.90 6.03	2.81 2.61	1 - 14 --
Age (current study)	20.03	4.75	17 - 42
Height- reported (current study)	65.47	3.05	54 - 73
Height- actual, with shoes on (current study)	66.03	2.51	59 - 72
Weight- reported (current study)	130.73	12.23	105-75
Weight actual (current study)	137.60	13.44	110-70
Weight difference (current study)	6.87	7.77	-29- 24
Percentage of MPMW- reported weights (current)	97.56%	--	--
Percentage of MPMW- actual weights (current) (Garner et al, 1993)	100.44% 99.6%	-- --	-- --
Grams Consumed (current study) (Herman and Mack, 1975)	108.74 146	52.98 --	27-302 --
Hours since last meal (current study)	4.05	1.52	0 - 6
Level of Hunger prior to taste test (current study)	2.77	1.34	0 - 5

Scores on the EDI had a mean total score of 38.55 and a BDS of 17.02, very similar to recent scores of 38.4 and 16.4 respectively found in a college student population and reported in Garner et al, (1993). The average score on the RRS of 14.99 was quite similar to other research completed at the University of Montana. Smith (1990) found an mean score of 14.62 on the RRS, and Ridgway (1994) found a mean score of 14.8. These three means are higher than the mean of 11.47 on the RRS found in a relatively recent restraint study done elsewhere (Dutchman, 1989). The mean number of grams of ice cream consumed in the current study was 108.74, less than the 146 mean grams consumed in the seminal restraint theory study done in by Herman and Mack (1975).

The means and standard deviations for each of the four groups are reported in Table 4 (see next page). On average, subjects were found to under-report their weight by 6.87 pounds. No significant differences at the $p < .05$ level were found using a one-way ANOVA between the four groups with respect to the discrepancy between their reported and actual weights. The four groups were compared on the following key variables which were judged to be possible confounds: actual body weight, seaonality, hours since subjects had last eaten, and pre-experimental hunger level. No significant differences were found at the $p < .05$ level between the four groups with respect to any of these key variables using a one-way ANOVA.

Table 4.
Means and Standard Deviations by Group

<u>Variable</u>	<u>Groups</u>			
	<u>LL</u>	<u>LH</u>	<u>HL</u>	<u>HH</u>
Body Dissatisfaction Scale				
Mean	9.00	22.60	10.60	25.87
SD	2.39	4.30	3.56	4.17
Revised Restraint Scale				
Mean	9.27	11.77	18.10	20.83
SD	2.83	2.47	2.22	3.17
Eating Disorder Inventory				
Mean	19.97	39.10	27.73	67.40
SD	10.42	12.71	15.29	23.50
Age				
Mean	20.67	19.63	20.73	19.10
SD	5.76	3.23	20.73	2.35
*Weight (actual) ^a				
Mean	135.23	136.83	139.39	138.98
SD	14.83	14.66	12.51	11.74
Weight (reported)				
Mean	129.33	130.73	131.67	131.20
SD	13.46	13.84	10.63	11.19
*Weight Difference ^a				
Mean	5.90	6.10	7.70	7.77
SD	5.98	10.68	6.58	7.18
*Hours since last food consumption ^a				
Mean	4.17	4.13	3.60	4.30
SD	1.56	1.53	1.57	1.42
*Level of Hunger (prior to taste test) ^a				
Mean	2.80	2.63	2.63	3.03
SD	1.30	1.40	1.40	1.27

LL = Low Restraint, Low Body Dissatisfaction
LH = Low Restraint, High Body Dissatisfaction
HL = High Restraint, Low Body Dissatisfaction
HH = High Restraint, High Body Dissatisfaction
^a = No significant difference ($p < .05$) between groups

Food Consumption

The mean grams of ice cream consumed by each group is displayed in Table 5 (see next page) along with significance levels. Because of the presence of heterogeneity of variance between the groups, a natural logarithmic transformation was performed, and the data was analyzed using this formulation. The omnibus test was significant, ($F(3, 113)=3.88, p=.011$) and main effects for both body dissatisfaction and pre-load condition pre-load condition were significant. Subjects with high body dissatisfaction consumed an average of 98.96 grams of ice cream, significantly less than the 116.91 grams consumed on average by subjects with low body dissatisfaction ($F(1,115)=6.58, p=.012$). Subjects who received a milkshake pre-load ate an average of 98.19 grams, significantly less than the subjects who did not receive a preload, whose mean consumption was 118.61 grams ($F(1,115)= 4.86, p=.03$).

A significant two-way interaction between body dissatisfaction and restraint level was found ($F(3, 113)=4.32, p=.040$), such that persons in the HH group consumed the least (mean = 86.7 grams), subjects in the LH group consumed the next highest amount of ice cream (mean = 106.23 grams), subjects in the LL group consumed the third highest amount (mean = 112.11 grams) and those subjects in the HL group consumed the most ice cream (mean = 127.93 grams). Student-Newman-Keuls paired comparisons tests revealed that the HL group differed significantly in comparison to the HH group ($p=.041$). Thus, the amount consumed by subjects with low restraint

Table 5.
Grams of Ice Cream Consumed by Condition and Subject Variable

Overall mean= 108.15, n=117, omnibus test significance of $F(3,113)$, $p = .011$

Main Effects

<u>Rest</u>	<u>Unrest</u>	<u>High BDS</u>	<u>Low BDS</u>	<u>Preload</u>	<u>NoPre</u>
107.67g	108.97g	98.96g	116.91g	98.19g	118.61g
NS		$p = .012$		$p = .030$	

Two Way Anovas

<u>Condition</u>	<u>Restrained</u>	<u>Unrestrained</u>	
<u>Preload</u>	97.18g	99.24g	
<u>No Preload</u>	118.52g	118.70g	NS

<u>Condition</u>	<u>High Body Dis</u>	<u>Low Body Dis</u>	
<u>Preload</u>	81.53g	113.42g	
<u>No Preload</u>	116.38g	120.69g	NS

	<u>High Body Dis</u>	<u>Low Body Dis</u>	
<u>Restrained</u>	86.71g	127.93g	
<u>Unrestrained</u>	106.23g	112.11g	$p = .040$

Three Way Anovas

<u>Condition</u>	<u>Restraint Status</u>	<u>High Body Dis</u>	<u>Low Body Dis</u>
<u>Preload</u>	<u>Restrained</u>	78.49g	115.87g
	<u>Unrestrained</u>	85.04g	110.78g
<u>No Preload</u>	<u>Restrained</u>	95.51	139.99g
	<u>Unrestrained</u>	137.25g	101.39g
			NS

NS = not significant

was similar regardless of the level of body dissatisfaction amount, whereas subjects with high restraint ate significantly more if they had low body dissatisfaction than if they had high body dissatisfaction (see Figure 4, next page). The three factor interaction was not significant.

A strong trend ($F(3,113) = 3.76, p = .055$) was noted for the two-way interaction between BDS and preload condition for the weights reported by the subjects at the screening sessions (all other analysis were made using the actual weights obtained after the taste test). High BDS tended to eat less with a preload than without, but low BDS tended to eat similar amounts regardless of preload condition (see Figure 5, page 44). The $2 \times 2 \times 2$ ANOVA (RRS \times BDS \times preload condition) is reported in Table 6 (see page 45).

A stepwise multiple regression analysis was performed on the grams consumed to determine which variables were the best predictors of consumption (see Table 7, page 46). The two significant predictors, using $R = .05$ to enter and $R = .10$ to remove were first, body dissatisfaction ($F(3,113) = 12.54, p = .0004$), and second, preload condition ($F(3,113) = 10.07, p = .0094$). Together the level of predictiveness was $r^2 = 13.23\%$, significant at the $p = .0001$ level.

A correlational analysis was conducted which included the following variables: the Concern for Dieting factor of the RRS, the Weight Fluctuation factor of the RRS, the RRS score, the total EDI score, the BDS, and the number of grams consumed (see Table 8, page 46). It was expected that the Concern for Dieting and the Weight Fluctuation factors would be highly correlated with

Figure 4

Amount of Ice Cream Consumed:
Body Dissatisfaction (BDS) by Restraint (RRS)

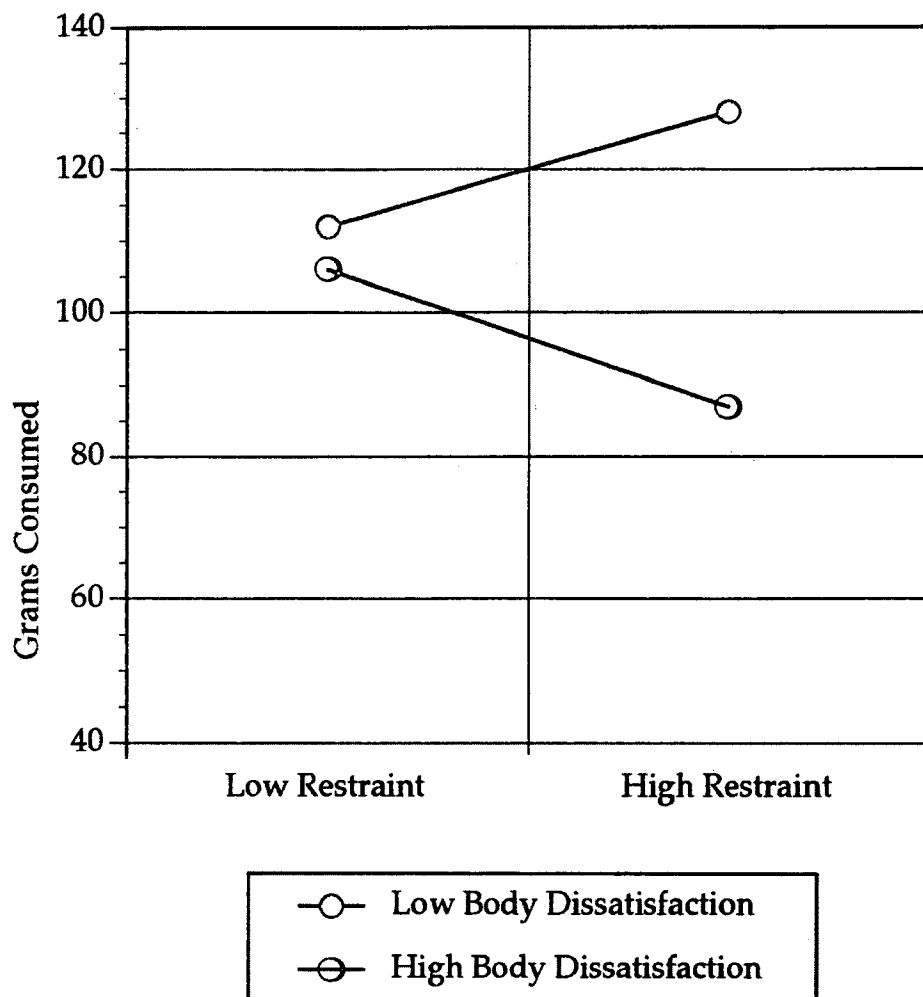


Figure 5.

Amount of Ice Cream Consumed:
Body Dissatisfaction (BDS) by Preload Condition

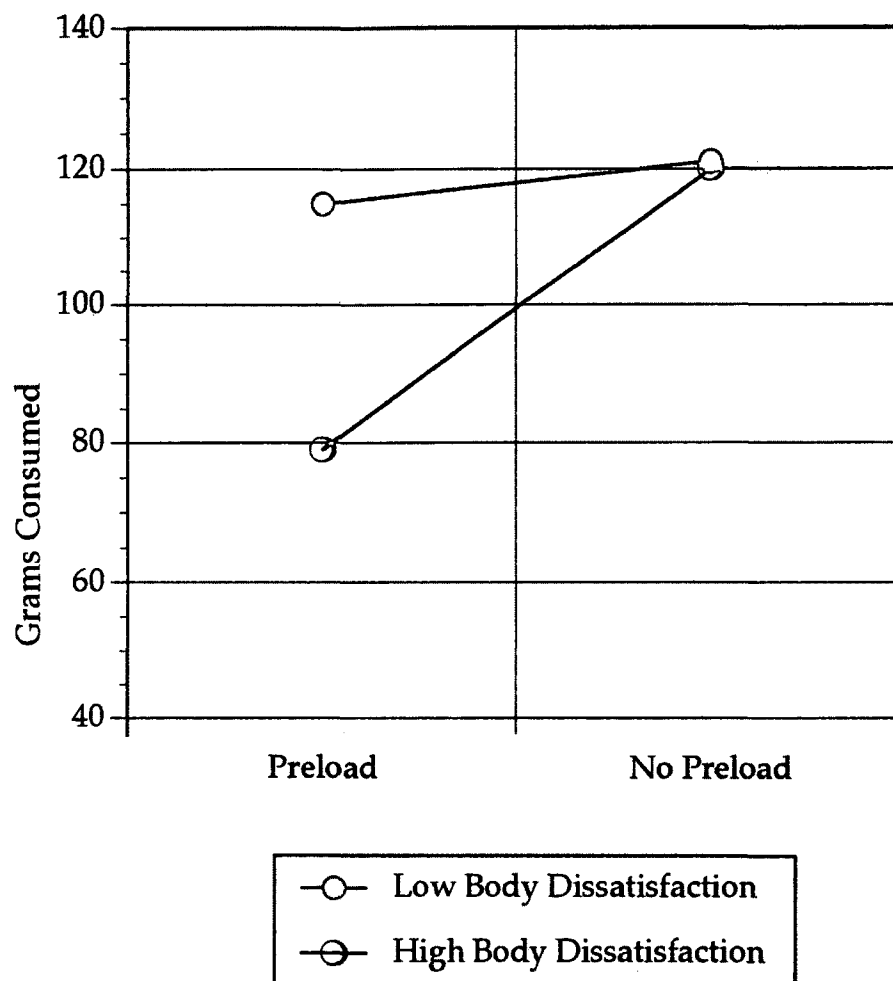


Table 6.

Analysis of Variance for Grams of Ice Cream Eaten

<u>Source</u>	<u>SS</u>	<u>MS</u>	<u>df</u>	<u>F</u>	<u>F-ratio</u>
Omnibus Test	2.409	.803	3	3.877	3.877**
RRS	.040	.040	1	.195	.660
BDS	1.363	1.363	1	6.578	.012**
Cond. (preload-no)	1.006	1.006	1	4.857	.030*
RRS X BDS	.894	.894	1	4.317	.040*
RRS x Condition	.042	.042	1	.201	.656
BDS x Condition	.383	.383	1	1.849	.177
3- Way Interaction	.458	.458	1	2.212	.140

* = $p < .05$

** = $p < .01$

Table 7.
Stepwise Multiple Regression Analysis

$F(3, 113) = 10.073$

Significance of $F = .0001$

<u>Variable</u>	<u>b</u>	<u>s_b</u>	<u>t</u>	<u>Sig. of t</u>	<u>VarR²</u>
Body Dissatisfaction	-.019	.005	13.296	.0004	8.8%
Condition	.222	.084	6.97	.0094	13.23%
Restraint	(not entered into the equation)				

Table 8.
Correlations between Test Scores and Ice Cream Consumed

	CD	WF	RRS	EDI	BDS	GRM
CD	1.000					
WF	.327**	1.000				
RRS	.873**	.742**	1.000			
EDI	.603**	.219*	.532**	1.000		
BDS	.427**	.120	.360**	.757**	1.000	
GRM	-.156	.031	-.097	-.269*	-.270*	1.000

CD= Concern for Dieting Factor of the RRS
 WF= Weight Fluctuation Factor of the RRS
 RRS= Revised Restraint Scale
 EDI= Eating Disorder Inventory
 BDS= Body Dissatisfaction Scale
 GRM= Grams of Ice Cream Consumed

* = $p > .01$
 ** = $p > .001$

the total RRS score, as these are imbedded in the RRS. Similarly, the high correlation between the subscale score BDS and the total EDI score was expected. The high correlation ($r=.53$, $df=114$, $p<.001$) between the RRS scores and the EDI scores is similar to the high level of correlation found in previous studies (Weidel et al, 1983; Rosen, 1987; Eldredge et al, 1990). A significant correlation ($r=.43$, $df=114$, $p<.001$) was also found between the BDS of the EDI and the Concern for Dieting factor of the RRS. In addition, the BDS was also highly correlated with the total RRS score ($r=.36$, $df=114$, $p<.001$).

Chapter 4

Discussion

Synopsis of Study and Hypotheses

Research in the restraint field has obtained relatively consistent restraint-by-preload group differences, but the amount of within group variance with respect to consumption has not been well explained. The goal of this study was to examine the additional variable of body dissatisfaction in conjunction with restraint in an effort to address one mediator of individual functioning that may account for differences in individual responses in consumption level among restrained eaters. The research questions posed were: 1) "Do level of restraint and body satisfaction interact to influence amount of food consumed?" and 2) "If so, how is this interaction affected by a 'diet-breaking' pre-load?"

In addition to the expectation that the classic two-way interaction in an ANOVA between restraint and preload condition would be found, the present study hypothesized a three-way interaction in which high body dissatisfaction would augment restrained eaters' disinhibition after a pre-load, and would also intensify the efforts of restrained eaters to avoid dietary transgression in the no preload condition. It was hypothesized that restrained eaters with high levels of body dissatisfaction could represent persons who are engaging in extreme cognitive and behavioral patterns that set them up

for more intense counterregulatory behavior. Restrained eaters who have less dissatisfaction with their bodies were expected to consume less after a preload, possibly representing successful dieters who are able to maintain their cognitive resolve to inhibit intake and have thus achieved a body shape with which they are satisfied. It was also suggested that body dissatisfaction might be found to be more predictive in a stepwise multiple regression analysis of counterregulatory eating than restraint level, and that higher levels of body dissatisfaction increase the likelihood that a person will become a restrained eater. In addition, a positive correlation between the RRS and the BDS scores was expected.

To test the initial hypothesis, subjects were classified into four groups according to their restraint scores (RRS) and their body dissatisfaction scores (BDS): LL= low on both scales, LH= low RRS, high BDS, HL= high RRS, low BDS, and HH= high on both scales.

Overview

Contrary to initial hypothesis, the data did not generally support the hypothesis of this study or those of previous restraint literature. In answer to the first question posed, "do restraint and body dissatisfaction interact to influence consumption," the significant two-way interaction between restraint and body dissatisfaction was such that the order of ice cream consumption, lowest to highest, was HH, LH, LL, HL. The HL group ate

significantly more than the HH group. Persons with low restraint ate a similar (and moderate, close to the mean for the total sample) amount whether they had high or low body dissatisfaction. Persons with high restraint, however, ate significantly more if they had low body dissatisfaction than if they had high body dissatisfaction. Apparently the relationship between restraint and body dissatisfaction is not one of straightforward augmentation of the classic restraint patterns of consumption as was expected. This will be discussed in more detail later in this section. With respect to the second question posed "how is this interaction affected by a 'diet-breaking' pre-load," the data did not reveal a three-way interaction. In addition, the expected classic interaction between restraint and preload was not significant, suggesting that the effect of theorized counterregulation and diet boundary was not substantiated.

The main effect for preload condition contradicted the classic counterregulatory eating behavior of restrained eaters in response to a preload. Regardless of restraint or body dissatisfaction, persons who received a preload ate less than those who did not receive a preload. In addition, the significant main effect for body dissatisfaction showed that subjects with high body dissatisfaction ate significantly less than those with low body dissatisfaction. A strong trend towards interaction was noted for body dissatisfaction and preload.

As was predicted, body dissatisfaction was the best predictor in the

stepwise multiple regression of consumption in the taste test, supporting the hypothesis that body dissatisfaction may play a more important or underlying role in eating behavior than dietary restraint. Interestingly, preload condition was the next best predictor. Restraint did not enter significantly into the equation. Finally, the expected high correlation between RRS and EDI was found. The BDS was more highly correlated with the CD factor of RRS than the total RRS, suggesting that a concern with dieting and a higher level of body dissatisfaction seem to co-exist. The body dissatisfaction scale focuses on size of areas that women in our culture tend to view as too large, and with shape of these parts, so it is quite focused on size and fatness. The CD factor focuses on intake of food that might be related to weight loss or weight gain and with one question on weight. One last finding of interest is that subjects in the study were found to under-report their weights by an average of 6.87 pounds.

Methodological Issues

In general, the average scores of subjects in this study on both the RRS and the EDI were very similar to normative data. Correlations between the RRS and the EDI were similar to the correlation found in Weidel et al (1983) sample ($r=.53$, $p<.01$). Because of this, it seems that data from this sample can be compared to data from previous restraint studies, and that this sample did not vary from the norm. In addition, no discernable confounds were

indicated by an analysis of several key variable that might have affected the amount consumed. The variables analyzed for differences between the four groups were: discrepancy between actual and reported weight, actual body weight, season, hours since the subject had last eaten, and the pre-experimental level of hunger.

One aspect of the sample that may have influenced the amount to which these groups actually represented different groups is that the LH and HL were closer to the mean than the LL and HH groups. In other words the subjects in the LH group had a higher low score than those in the LL group, and vice-versa for the HL group as compared to the HH group. In addition, due to relatively high correlation between RRS and BDS, the LH and HL cells were more difficult to fill, as fewer subjects scored high on one measure and low on another.

The data for this study differed from previous studies in that no group ate significantly more when preloaded. The main effect of eating less after a preload was consistent for all combinations of groups. This findings suggests that the concepts of counterrugulation and disinhibition are less robust than previously thought to be.

In addition, the mean amount of ice cream consumed in the taste test was less than in previous studies, though other variables and scores were strikingly similar. In the more recent Lowe, Whitlow and Bellwoar (1991) study the overall mean is not reported, but it appears to be between 125 and

130 grams, which is less than the Herman et al study of 1975 which had a mean consumption of 146. The current mean consumption of 109 grams is less than the mean for the Lowe et al 1991 study whose data was probably collected in 1989.

It may be that with the increasingly slim cultural ideal body type for women described in a prior section on the cultural backdrop of body dissatisfaction (Wiseman et al, 1992) and the recent increasing concern with reducing fat intake (Shapiro, 1994), that this population of subjects differs from previous taste-test participants in that they are aiming for a thinner body shape and a more restricted diet than ever before. The recent national obsession with reducing fat intake would make a high-fat food such as ice cream particularly subject to restriction.

Recent Theoretical Developments in Restraint

Although studies using the classic restraint theoretical and research paradigm have proliferated over the last 15 years, recently researchers are questioning its validity and suggesting that the classic theory may be too simplistic to account for differences within groups of restrained eaters. A brief review of this recent theoretical shift may help to elucidate some of the findings of the current study. Lowe (1993) has developed a new theory that attempts to explain some of the contradictory findings in the restraint research. Lowe's Three Factor Model includes frequency of dieting and

overeating, current dieting, and weight suppression. Frequency of dieting and overeating seems to most closely resemble the construct of dietary restraint as it has historically been conceptualized, describing the person's history with dieting and overeating. Current dieting refers to the subject's current dieting status, and weight suppression "refers to a significant diet-induced weight loss that it sustained for a lengthy period of time (ie., one year or more)" (Lowe, 1993).

Lowe suggests that the theorized constructs of the diet boundary and cognitive regulation are not sufficient to explain consumption patterns in the research, and points out that the RRS does not discriminate between history of dieting and current dieting. This is crucial, as he theorizes that a past history of dietary restraint and current dieting have different effects on consumption.

In a study with unrestrained dieters, restrained dieters, and restrained non-dieters (Lowe et al, 1991), it was found that restrained non-dieters ate more with preload than without (as in previous restraint research), but restrained dieters ate less with preload than without. In the non-preload condition, restrained current dieters ate more than did restrained and unrestrained non-dieters. Based upon this data and upon results from other studies, Lowe hypothesizes that when challenges to one's diet are not made salient (for example in the taste test with no preload in which lots of food is available), then consumption is greater. However, when challenges to ones

current diet are made salient (for example, a large pre-load is presented), consumption is controlled. Current dieters could be viewed as being “on guard.”

Re-evaluation of Current Results

The main effect of preload condition, such that preloaded subjects ate less than non preloaded subjects, could be due simply to satiety, but it could also be due to the fact that a concern with or awareness of diet and consumption was made more salient, as indicated by Lowe (1993). It is not possible to see if the current results follow this theory exactly, however, as the current dieting status was not assessed. The main effect of eating less after a preload was fairly consistent for all combinations of groups, possibly due to the proposed changes in the population relating to idealized body type and concern with fat intake described previously.

The main effect for body dissatisfaction in the current study that subjects with high BDS ate less than low those with low BDS may indicate that persons with higher levels of body dissatisfaction react to the taste test as a current dieter would when preload is not taken into account, generally inhibiting their intake. It's possible that they are more likely to actually be on a diet currently at the time of the study than those who are more satisfied with their bodies. Yet, even in the absence of current dieting, persons with high body dissatisfaction may be more likely to restrict their consumption

when presented with an obvious threat of weight gain such as the taste test--with or without the preload. The fear of becoming fat or fatter may not be as salient for subjects with low levels of body dissatisfaction

The two-way interaction between RSS and BDS, such that subjects in the HL group ate significantly more than those in the HH group can be conceptualized in term of Lowe's 1991 study with restraint and dieting status. If high body dissatisfaction is hypothesized to co-exist with a current dieting status or a concern with becoming "fatter," this concern may mediate any tendency restrained subjects may have to consume more when presented with unlimited ice cream. HH subjects may perform in the taste test similar to the restrained dieters in the Lowe et al (1991) study. Persons with a history of dieting and overeating (high restraint) might be more likely to overeat in the face of unlimited access to ice cream regardless of preload if they had no current dieting mind-set to keep them "in line."

The trend towards a two-way interaction between BDS and preload for reported weights suggests that subject's dissatisfaction with their body may lead them to have a current "diet mind-set." Recall that subjects tended to underestimate their weight, and that with lower weights their BDS would be higher. This is due to the fact that the same Body Dissatisfaction Score at a lower weight gets adjusted to a higher BDS than at a higher weight. This allows higher body dissatisfaction scores at lower weights to reflect a greater level of dissatisfaction above and beyond the expected level of dissatisfaction

engendered by our culture. Thus, the BDS contribution to this trend is greater than with actual weights. Subjects with high BDS ate less with a preload than without a preload, but low BDS subjects ate similar amounts regardless of preload (but followed the same trend). It seems that a high level of body dissatisfaction further restricts consumption in such a way that the restrictive effect of the preload is intensified. This is similar to Lowe's (1993) formulation of current dieters who ate less if their diet was made salient with a preload.

Conclusions and Recommendations for Further Research

Rather than acting as an intensifier of the classic restrained eaters' response to restriction of intake with no preload and the disinhibition with a preload as was originally hypothesized, body dissatisfaction appears to be correlated with restraint, but to have very different effects on consumption. High body dissatisfaction appears to act as a restrictive influence on consumption in general (main effect), as well as in conjunction with high restraint status and, though less conclusively, with a preload.

Note that body dissatisfaction in this study is the variable most predictive of consumption, more than preload or restraint level, and that it seems to influence consumption differently than expected. There is dearth of research that pairs body dissatisfaction with variables such as restraint, current dieting status, weight suppression, obesity, etc in the taste-test

paradigm. In light of the significant and contradictory findings of this study and the absence until now of studies which address this, it seems crucial to examine body dissatisfaction within the taste test paradigm and its' possible interaction with these other variables. Because body dissatisfaction effects on consumption seem similar to the effects of dieting status, it would be interesting to explore the possible interaction between these two variables.

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Appendix A
Eating Habits Questionnaire
(Revised Restraint Scale)

1. How often are you dieting?

never	rarely	sometimes	often	always
-------	--------	-----------	-------	--------
2. What is the maximum amount of weight (in pounds) that you have ever lost within one month?

0 - 4	5 - 9	10 - 14	15 - 19	20+
-------	-------	---------	---------	-----
3. What is your maximum weight gain within a week?

0 - 1	1.1 - 2	2.1 - 3	3.1 - 5	5.1+
-------	---------	---------	---------	------
4. In a typical week, how much does your weight fluctuate?

0 - 1	1.1 - 2	2.1 - 3	3.1 - 5	5.1+
-------	---------	---------	---------	------
5. Would a weight fluctuation of 5 pounds affect the way you live your life?

not at all	slightly	moderately	very much
------------	----------	------------	-----------
6. Do you eat sensibly in front of others and splurge alone?

never	rarely	often	always
-------	--------	-------	--------
7. Do you give too much time and thought to food?

never	rarely	often	always
-------	--------	-------	--------
8. Do you have feelings of guilt after overeating?

never	rarely	often	always
-------	--------	-------	--------
9. How conscious are you of what you are eating?

not at all	slightly	moderately	extremely
------------	----------	------------	-----------
10. How many pounds over your desired weight are you?

0-1	1 - 5	6 - 10	11 - 20	21+
-----	-------	--------	---------	-----
11. How likely are you to fail to stay on a weight reduction diet?

never fail	rarely fail	sometimes fail	often fail	I don't diet
------------	-------------	----------------	------------	--------------
12. When you are on a diet and have eaten slightly more than your limit of calories, what do you usually do?
 - A. Cut back on food for a long time to make up for it.
 - B. Just stop eating and go back to the regular diet.
 - C. Tell myself I will diet tomorrow; and eat a bit more.
 - D. Consume at least several more helpings, and promise myself to do better tomorrow.
 - E. This question does not apply to me since I never diet to lose weight.

Appendix B

Eating Disorder Inventory

“EATING HABITS INVENTORY”

This is a scale which measures a variety of attitudes, feelings, and behaviors. Some of the items related to food and eating. Others ask you about your feelings about yourself. THERE ARE NO RIGHT OR WRONG ANSWERS SO TRY VERY HARD TO BE COMPLETELY HONEST. Read each question and place an “X” in the column which best applies to you. Please answer each question very carefully. Thank you.

ALWAYS USUALLY OFTEN SOMETIMES RARELY NEVER

- | ALWAYS | USUALLY | OFTEN | SOMETIMES | RARELY | NEVER | |
|--------|---------|-------|-----------|--------|-------|--|
| _____ | _____ | _____ | _____ | _____ | _____ | 1. I eat sweets and carbohydrates without feeling nervous. |
| _____ | _____ | _____ | _____ | _____ | _____ | 2. I think my stomach is too big. |
| _____ | _____ | _____ | _____ | _____ | _____ | 3. I wish I could return to the security of childhood. |
| _____ | _____ | _____ | _____ | _____ | _____ | 4. I eat when I am upset. |
| _____ | _____ | _____ | _____ | _____ | _____ | 5. I stuff myself with food. |
| _____ | _____ | _____ | _____ | _____ | _____ | 6. I wish I could be younger. |
| _____ | _____ | _____ | _____ | _____ | _____ | 7. I think about dieting. |
| _____ | _____ | _____ | _____ | _____ | _____ | 8. I get frightened when I think my feelings are too strong. |
| _____ | _____ | _____ | _____ | _____ | _____ | 9. I think my thighs are too large. |
| _____ | _____ | _____ | _____ | _____ | _____ | 10. I feel ineffective as a person. |

ALWAYS USUALLY OFTEN SOMETIMES RARELY NEVER

- | ALWAYS | USUALLY | OFTEN | SOMETIMES | RARELY | NEVER | |
|--------|---------|-------|-----------|--------|-------|--|
| _____ | _____ | _____ | _____ | _____ | _____ | 11. I feel extremely guilty after overeating. |
| _____ | _____ | _____ | _____ | _____ | _____ | 12. I think 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 about gaining weight. |
| _____ | _____ | _____ | _____ | _____ | _____ | 17. I trust others. |
| _____ | _____ | _____ | _____ | _____ | _____ | 18. I feel alone in the world. |
| _____ | _____ | _____ | _____ | _____ | _____ | 19. I feel satisfied with the overall shape of my body. |
| _____ | _____ | _____ | _____ | _____ | _____ | 20. I am generally in control of things in my life. |

ALWAYS USUALLY OFTEN SOMETIMES RARELY NEVER

- | ALWAYS | USUALLY | OFTEN | SOMETIMES | RARELY | NEVER | |
|--------|---------|-------|-----------|--------|-------|---|
| _____ | _____ | _____ | _____ | _____ | _____ | 21. I get confused about what emotion I'm 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 my weight. |
| _____ | _____ | _____ | _____ | _____ | _____ | 26. I can clearly identify what emotion I am feeling. |
| _____ | _____ | _____ | _____ | _____ | _____ | 27. I feel inadequate. |
| _____ | _____ | _____ | _____ | _____ | _____ | 28. I have gone on eating binges where I have 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. |

ALWAYS USUALLY OFTEN SOMETIMES RARELY NEVER

- | ALWAYS | USUALLY | OFTEN | SOMETIMES | RARELY | NEVER | |
|--------|---------|-------|-----------|--------|-------|--|
| _____ | _____ | _____ | _____ | _____ | _____ | 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 with me. |
| _____ | _____ | _____ | _____ | _____ | _____ | 34. I have trouble expressing 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 binging (overeating). |
| _____ | _____ | _____ | _____ | _____ | _____ | 39. I feel happy that I am not a child anymore. |
| _____ | _____ | _____ | _____ | _____ | _____ | 40. I get confused as to whether or not I am hungry. |

ALWAYS USUALLY OFTEN SOMETIMES RARELY NEVER

- | ALWAYS | USUALLY | OFTEN | SOMETIMES | RARELY | NEVER | |
|--------|---------|-------|-----------|--------|-------|--|
| _____ | _____ | _____ | _____ | _____ | _____ | 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 that my hips are too big. |
| _____ | _____ | _____ | _____ | _____ | _____ | 46. I eat moderately in front of others and stuff myself after 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. |

ALWAYS USUALLY OFTEN SOMETIMES RARELY NEVER

- | ALWAYS | USUALLY | OFTEN | SOMETIMES | RARELY | NEVER | |
|--------|---------|-------|-----------|--------|-------|---|
| _____ | _____ | _____ | _____ | _____ | _____ | 51. When I am upset, I don't know if I'm sad, frightened , or angry. |
| _____ | _____ | _____ | _____ | _____ | _____ | 52. I feel that I must do things perfectly , or not do them at all. |
| _____ | _____ | _____ | _____ | _____ | _____ | 53. I have 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. |
| _____ | _____ | _____ | _____ | _____ | _____ | 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 that my buttocks are too large. |
| _____ | _____ | _____ | _____ | _____ | _____ | 60. I have feelings I can't quite identify. |
| _____ | _____ | _____ | _____ | _____ | _____ | 61. I eat or drink in secrecy. |
| _____ | _____ | _____ | _____ | _____ | _____ | 62. I have extremely high goals. |
| _____ | _____ | _____ | _____ | _____ | _____ | 63. I think my hips are just the right size. |
| _____ | _____ | _____ | _____ | _____ | _____ | 64. When I am upset, I worry that I will start eating. |

Appendix C
Demographic Questionnaire

Name _____ Last six digits of SSN__ _ - _ _ _ _

Phone _____

Gender: male_____ female_____

Age_____

Weight _____

Height_____

Year in School: Freshman _____

Sophomore _____

Junior _____

Senior _____

Other _____

Appendix D

Developmental Questionnaire

For the first two questions, please fill in the blank(s).

1. How old were you when you started to menstruate? _____ years old
 2. What grade were you in when you started to menstruate? _____ grade

For the next 4 questions, circle the answer that best applies to you.

3. How did you feel about starting to menstruate?

very positive	somewhat positive	neutral	somewhat negative	very negative
------------------	----------------------	---------	----------------------	------------------

4. How did you feel about your body shape when you were 12 yrs old?(circle one)

very positive	somewhat positive	neutral	somewhat negative	very negative
------------------	----------------------	---------	----------------------	------------------

5. How did you feel about your level of attractiveness you were 12 yrs old?(circle one)

very positive	somewhat positive	neutral	somewhat negative	very negative
------------------	----------------------	---------	----------------------	------------------

6. What was your body shape as a child between the ages of 6 & 12 yrs old?(circle one)

very thin	somewhat thin	normal weight	somewhat overweight	very overweight
--------------	------------------	------------------	------------------------	--------------------

7. "I started to menstruate ____ than my friends"(circle one)

<u>earlier</u>	<u>about the same time</u>	<u>later</u>
----------------	----------------------------	--------------

8. Please describe in three or four sentences how you felt about starting to menstruate.

Thank you very much for your participation.

Appendix E

Hunger Scale

1. How many hours has it been since you last had something to eat?
2. What was it that you last ate?
3. How hungry are you at this time?

:-----:-----:-----:-----:-----:-----:

Not hungry
at all

Very
Hungry

Appendix G
Normal Weights for Women

Height		MPMW	Range of Normal Weight	
<u>ft in</u>	<u>inches</u>		<u>-15%</u>	<u>to +15%</u>
4 10	58	115	97	to 132
4 11	59	117	99	to 135
5 0	60	119.5	102	to 137
5 1	61	122	104	to 140
5 2	62	125	106	to 144
5 3	63	128	109	to 147
5 4	64	131	111	to 151
5 5	65	134	114	to 154
5 6	66	137	116	to 158
5 7	67	140	119	to 161
5 8	68	143	122	to 164
5 9	69	146	124	to 170
5 10	70	149	127	to 171
5 11	71	152	129	to 175
6 0	72	155	132	to 178

(MPMW, or “matched population mean weight” derived from the weight and height table of 1979, Metropolitan Life Insurance Statistical Bulletin, 1983)

Appendix H
Informed Consent Form

Informed Consent
"The Effects of Temperature on Taste Perceptions"
Principal Investigator: Linda Schrader, B.S.
Under the direction of Professor D. Balfour Jeffrey, Ph.D.
University of Montana

I understand that by signing my name below, I give my informed consent to participate in this study.

1. The procedures to be followed include completion of two brief questionnaires, perhaps consuming a cold liquid, and participating in an ice cream taste test to help determine the effects of temperature on taste perceptions. The total time for participating in this study is between 45 and 60 minutes, which includes time for your debriefing after your participation.
2. All information will be kept confidential. Your name will not be associated with any of the data collection and only a subject number will be used to identify your data.
3. You will receive two experimental credits for participating in this study.
4. You may refuse to participate or discontinue participation at any time, without prejudice to you and without jeopardy to any credits you're entitled to.
5. You may contact the Principal Investigator, Linda J. Schrader, at 243-4523 to answer any questions you may have about the study. Because of confidentiality, no information can be provided to you about any other participating individual.

I HAVE READ AND UNDERSTAND THE ABOVE AND HEREBY AGREE
TO PARTICIPATE IN THIS STUDY.

Participant's signature

Date

Experimenter's signature

Date

Appendix I

Internal Review Board Proposal **DIETARY RESTRAINT AND LEVEL OF BODY SATISFACTION** Investigator : Linda J. Schrader

1. Description of the Research

The goal of the proposed research project is to investigate the effects of two subject variables, dietary restraint and level of body satisfaction and one experimental variable, administration of a milkshake "preload" upon the eating behavior of undergraduate females.

This study uses a 2 x 2 x 2 factorial design (level of restraint x body satisfaction x pre-load condition).

2. Benefits of the Research

Dietary restraint theories attempt to explain the cognitive regulatory behaviors that dieting individuals engage in to control their food consumption. Research suggests that chronic dieters, or "restrained eaters," are more at risk for development of a clinical eating disorder than are "unrestrained eaters." It has also been found that body dissatisfaction, though common for the majority of women in America, is more extreme in persons with eating disorders. A great deal of research has been done on the concept of dietary restraint, but little research has examined the relationship between dietary restraint and body image dissatisfaction. Examining the relationship between these two variables and the eating behavior of a "normal" analogue population will improve the understanding of eating disordered individuals and of chronic dieters. These people represent a group that is at risk for developing eating disorders and may provide an opportunity for primary prevention and clinical intervention.

3. Use of Subjects

Approximately 250 female undergraduates will be administered a brief demographic form, the Revised Restraint Scale, the Eating Disorders Scale, and a developmental questionnaire (a pilot instrument) during a Psychology 100 group screening procedure in the Fall of 1993. The students will receive 2 experimental credits for participating in the screening.

A median split will be performed on both scales, dividing the subjects into four groups; high restrained/high body satisfaction, high restraint/low body satisfaction, low restraint/high body satisfaction, and low restraint/low body satisfaction. Forty subjects will be recruited from each of these four groups to participate in the laboratory segment of the study. These groups will be divided further with half of each group receiving a preload consisting of a milkshake, and half receiving no pre-load.

In order to collect experimental data on 160 subjects, a sufficient

number of the screened subjects will then be contacted via phone by a female experimenter and will be asked to participate in a study examining "the relationship between temperature and taste." If they agree to participate, a time will be arranged for them to participate and they will be asked to refrain from eating for two hours prior to the study.

Upon arrival, the subject will be greeted by a female experimenter. The subject will read and sign an informed consent form and will complete a brief hunger scale which asks them when and what they last ate and to rate their level of current hunger. Subjects who report that they have eaten will be rescheduled. Subjects will be randomly assigned to either the "cold mouth" condition or the control condition. The "cold mouth" condition will be achieved by having the subject consume a 15-ounce milkshake. This is actually the pre-load. Half of the subjects in each median split group will consume a pre-load and half will not.

After the pre-load is consumed for subjects in that condition, or after the no-preload subjects have signed the consent form, the subjects will be taken in to the "tasting room" and will be given three large bowls containing three flavors of ice cream (chocolate, vanilla and strawberry), serving spoons, three individual tasting cups and spoons, and three rating forms. Subjects will be instructed to serve the ice cream into their own tasting cups with the serving spoons and are to taste the ice cream using their tasting spoons for sanitation purposes. They will be asked to rate the three flavors. After ten minutes the experimenter returns and gives the subject another hunger rating scale. The subject will then be weighed and measured, their hunger will be assessed again, and they will be debriefed about the taste test in a clinically sensitive manner that addresses any concerns that may arise. The subject will be informed that the results of the study will be posted in April of 1994, that the time and date of the full disclosure will also be posted at that time, and that they are invited to attend. After the subject has left, the experimenter will weigh the remaining ice cream to determine the amount consumed.

4. Description of Subjects

One-hundred-sixty normal weight female undergraduate students who are enrolled in Introductory Psychology in Fall term 1993 and Spring Term 1994 will serve as subjects. Subjects will receive experimental credit required by their introductory psychology course for participation.

5. Risks and Discomforts

Only those subjects who are within 15% of their normative body weight will participate in the laboratory segment of the study in order to avoid confounding data and the risk of utilizing subjects with a serious eating disorder. Subjects with lactose intolerance, an allergy to chocolate, diabetes, or hypoglycemia will not be invited to participate in the laboratory

segment. Thus, no risks or discomforts are anticipated.

6. Correction of Undesirable Consequences to Subjects

No undesirable consequences are expected to occur, but in the event that a subject experiences discomfort the experiment will stop, she will be debriefed about the experiment until such time that she indicates that she is fully recovered, and she will be given the primary investigator's phone number should she need further debriefing.

7. Protection of Confidentiality

During the screening session, subjects will complete a brief demographic form which will ask for their name and phone number. These demographic forms will be labeled and filed with a subject number which is also marked on the screening questionnaires. The forms and the questionnaires will be kept stored separately. In order to schedule experimental sessions, Research assistants (Psychology 397 students) will be provided with a list of prospective subjects and their phone numbers, but they will be given no other information about the subjects. These research assistants will also conduct the experimental sessions and will remain blind to the subjects responses to the questionnaires.

8. Informed Consent

A copy of the form to be used for obtaining informed consent is included in this proposal.

9. Waiver of Informed Consent

Not applicable.

10. Other Information Pertaining to Ethical Responsibility.

Not necessary

D. Balfour Jeffrey, Ph.D.
Professor of Psychology
Chair of Thesis Committee

Appendix J

Phone Contact Script

Initial Call:

"Hello, this is experimenter's name, may I speak with subject's name? Hi, I'm a research assistant in the Psychology department, and I wondered if you would be interested in participating in an experiment for 2 experimental credits for your Psych 100 class. (Pause, see if they are interested. If they have all their exp. credits, see *) Great, let me tell you a little bit about the experiment. The experiment is called Temperature and Taste, and we are examining the effect that temperature has on taste. The experiment takes 20 to 30 minutes and we can set up a time that fits your schedule. Would you be interested? Okay. Let me ask you a couple of questions first. Do you have any allergies to milk products or chocolate? Are you diabetic or hypoglycemic? (*If yes, thank them and hang up, if no--->*)

Alright, let's set up a time for you. We require that you refrain from eating for two hours prior to the appointment, so please think about when you normally tend to eat breakfast, lunch and snacks. We'll schedule your appointment for a time when you normally will not have eaten for two hours. Here are times I have available:

*(E lists the times that they have available and a time is determined. If none of these times work for the subject, other times are presented and the person is told that they will be contacted by another research assistant. See below***)*

#So, date and time of appt. is a time when you will be able to refrain from eating for two hours prior to the appointment? Good. You will need to come to the Clinical Psychology Center or "CPC" where the experiment is being held. Please come 5 minutes early, and take a seat in the lobby area; I'll come get you. It is very important that you be there at time -5 mins because our appointments are scheduled back to back. Do you have any questions? Okay, subject's name, I'll see you on date and time of appt. at the CPC for the Temperature and Taste experiment. If for some reason you can't make it, please call me at home the day before your appointment so we can reschedule, and my name is _____, just in case. Remember, please don't eat anything for two hours prior to your appointment. Thank you so much for your participation. Take care, bye!"

Reminder Call

"Hello, this is experimenter's name, may I speak with subject's name? Hi, I'm just calling to remind you about your appointment tomorrow for the Temperature and Taste Experiment. We just like to call everyone to remind them of the time and place. Your appointment is at _____ tomorrow at the Clinical Psychology Building or CPC. Do you remember how to get there? Okay? Great, I'll see you there. Please come at _____, 5 minutes before your appointment. Thank you! Bye.

***Persons who have all their experimental credits:**

Oh, you have all your credits. Well, would you be willing to participate voluntarily? It only takes about 25 minutes, and we would really appreciate it if wouldn't be too much trouble for you. [continue on if they agree, otherwise just thank them and say good-bye in a friendly way. Do not apply undue pressure].

****List of times available:**

Give them your times:

*****Second Contact, if the subject has been passed to another experimenter.**

"Hello, this is experimenter's name, may I speak with subject's name? Hi, I'm a research assistant in the Psychology department, and I was given your name by another research assistant who said that you were interested in the Temperature and Taste experiment. They thought I might have times that will work with your schedule. Okay, remember, the experiment takes 20 to 30 minutes and you will receive 2 credits for participation.

Alright, let's set up a time for you. We require that you refrain from eating for two hours prior to the appointment, so, again, please think about when you normally tend to eat breakfast, lunch and snacks. We'll schedule your appointment for a time when you normally will not have eaten for two hours. Here are times I have available (*E lists the times that they have available, and a time is determined. Back to #*)

Appendix K

Experimenter's Script for the Taste Test Segment

A.

Greet and take them back to the room

Hi (subject's name), I'm, (experimenter's name) the research assistant.
How are you doing?...Good, we'll be in room 108.

Lead the way to 108

Have a seat. Thanks for participating in this study. This will take from 20 to 30 minutes, and you'll receive 2 experimental credits. I can't answer any questions about the purpose of the study while we are conducting it, but when we have finished I'll be happy to answer any questions you may have about the taste test, okay?

Give Subject informed consent form

Please read the following, and if you agree to participate in this study, sign right here.

Subject signs informed consent

B. As you know from your phone contact, we are interested in the effects of temperature in taste sensations. Before we begin, there is a short questionnaire here for you to take. I know you were instructed not to eat anything for two hours prior to the experimental session. And I also know that it's hard enough to remember to come to an experiment, let alone remember two hours beforehand that you are not supposed to eat anything. If you have forgotten and eaten something, please write it down so we can determine if there are any taste interactions.

Give Subject the hunger scale, subject completes this.

Review questionnaire to see when the S has last eaten and put it aside.

(If the S reports food intake of any kind within the last 2 hours, the subject will be rescheduled using the following script in a friendly tone of voice:

"Well, we'll need to reschedule you because this really requires that you not eat 2 hours prior to the taste test. Here is a list of times I'm available. [Get out your schedule, only give them other time options if they can't make any of your times] Let's try to find a time when you normally won't have eaten for 2 hours prior. What time works best for you? [a time is decided upon, subject is given a reminder slip]. Thanks so much for your cooperation. We'll see you on time and day of rescheduled session.")

C. Great. The goal of the study is to determine the effect that temperature has on taste, and to obtain prospective consumers' opinions regarding ice cream tastes under varying conditions, in a setting free of marketing gimmicks, such as advertisements, packaging, etc. You are in the control/ cold mouth condition.

Say only one of these*

*Control Condition:

Okay, I'll set up the taste test.
(Proceed to **D**)

*Cold Mouth Condition:

"I'll be right back."

Go behind partition and mix milkshake
5 full scoops of ice cream
1 & 1/4 cup milk
blend on whip
pour into glass, fill to the brim
put left over in freezer

Give this to subject with a spoon

Here is a cold milkshake for you to drink. Please drink all of it within the next 5 minutes, and please let me know when you're finished.

Subject finishes milkshake

(If subject cannot finish milkshake, end experimental session, give subject 2 experimental credits, and record this)

Okay, thanks. I'll set up the taste test.

Take empty cup

D.

Get ice cream tray and bowls and rating forms. Set them out on tasting table

Now, this study is concerned with peoples' sensitivity and liking for different kinds of tastes. Please taste and rate each of these three flavors of ice cream using these three rating forms.

Set out each rating form in front of its flavor

Please use these serving spoons to dish out the ice cream, and these tasting spoons to taste. [Set them out]. Take as much as you need to be sure of your rating before going on the next flavor. Fill out all of the ratings for the first flavor before tasting any of the next one. Please do not change a rating after having tasted another flavor-- once you have tasted a new one

you may not go back and change any ratings of another flavor. Please rate the three flavors in the order in which they are laid out in front of you so that the tastes don't get mixed up. Oh, also -- we'll be throwing away any leftover ice cream at the end of the day, so feel free to eat as much as you like after you're done rating the flavors. It is important, however, that you don't go back and change any of your ratings. I'll be back in about 10 minutes."

Get timer, leave room, start timer

Return to room after exactly 10 minutes, knocking on the door before entering

E. Are you finished? Okay, thanks.

Take the ice cream tray and rating forms (put ice cream into freezer)

Get the subject's clip board,

Give subject the post experimental hunger scale

Now, please fill out this form

(Subject completes this)

Thanks. Now I'll need to take your weight and height. Please come this way

Take subject to scale

Weigh and measure the subject and record it on the post exp. hunger scale

Okay, let's go back to the room

F: Do you have any questions or concerns about the taste test?"

Answer questions about the taste test, but if S asks about other purposes of the study, E says that they are simply doing a taste test.

Let's mark down your experimental credits right now.

Get Exp. credit sheet and mark this down

Also, if you're interested in finding out about the results of the study, you can come to a presentation about this study at the end of this term. The date and time will be posted across the hall from the Psychology Office on the main floor of PHP on April 1st. Any (other) questions? Okay. Thank you again for your participation.

Let the subject out and point them towards the lobby area

