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The Effects of Laboratory Stress on Appraisal of Control in Bulimia

Maria L. Kearney

THE EFFECTS OF LABORATORY STRESS ON APPRAISAL OF CONTROL IN BULIMIA

by

Maria L. Kearney
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This dissertation, submitted by Maria L. Kearney in partial fulfillment for the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

(Chairperson)

This dissertation meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

Dean of the Graduate School

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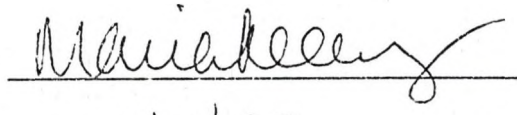
Signature 

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ABSTRACT

Recent work pertaining to bulimia has shown that bulimics tend to perceive themselves as having a decreased ability to control their environments, particularly when faced with a stressful situation. Results from studies examining the type or amount of stress experienced by bulimics have been inconsistent. The transactional model of stress, which calls for the examination of an individual's appraisal of a situation, provides a more advanced method of measuring stress than has generally been used in past studies.

The present study sought to examine bulimics' perceptions of control in stressful and nonstressful situations using an in vivo behavioral task. Thirty female undergraduate bulimics and thirty noneating-disordered controls engaged in a 40 trial contingency-learning task in which they estimated the amount of control they could exert. Half of the subjects were placed in a stressful condition, which involved a statement linking their performance with their intellectual functioning.

The results of the study failed to demonstrate that bulimics perceived themselves as having less control than the noneating-disordered control subjects. However, this study

was unable to address whether the stress could elicit differences in the appraisal of control as the stress manipulations proved unsuccessful. This study did find, however, that for bulimic subjects, increases in amount of behavioral involvement (i.e., button-pressing) did not result in increases in perceived control, as was the case for the noneating-disordered control subjects. These results are interpreted within a learned helplessness framework as suggesting that bulimics may not view themselves as being able to exert control over their lives, regardless of the amount of effort they exert.

INTRODUCTION

Recent studies indicate that between two and four percent of college females meet the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987) diagnostic criteria for bulimia nervosa (Drewnowski, Yee, & Krahn, 1988; Pyle, Newman, Halvorson, & Mitchell, 1991; Mintz & Betz, 1988; Striegel-Moore, Silberstein, Frensch, & Rodun, 1989). However, it is estimated that an alarming 61% of college females display some intermediate form of eating problem such as binging or purging alone or chronic dieting (Mintz & Betz, 1988). Binge eating and purging can lead to serious medical complications, including electrolyte disturbances, cardiac irregularities, kidney dysfunction, neurological abnormalities, gastrointestinal disturbances, and even death (Garner & Garfield, 1985).

Bulimia is an eating disorder characterized by rapid consumption of a large amount of food in a relatively short period of time, typically less than two hours. It is also characterized by an awareness that the eating pattern is abnormal, a fear of not being able to stop eating voluntarily, depressed mood and self-depreciating thoughts after binging (Butterfield & Leclair, 1988). Self-induced

vomiting, restrictive dieting, and/or use of diuretics or laxatives to lose or control weight typically accompany binge eating.

Diagnosis

DSM-III-R Criteria

In order to receive a diagnosis of bulimia nervosa an individual must meet each of the following criteria (American Psychiatric Association, 1987):

1. Recurrent episodes of binge eating (rapid consumption of a large amount of food in a discrete period of time).
2. A feeling of lack of control over the eating behavior during the eating binges.
3. The person regularly engages in either self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise in order to prevent weight gain.
4. A minimum average of two binge eating episodes a week for at least three months.
5. Persistent overconcern with body weight and shape.

Associated Features

In addition to symptoms related to eating behavior, bulimia is associated with a variety of attitudinal and personality characteristics. For example, individuals with bulimia have been shown to exhibit maladaptive attitudes toward food and eating, as well as a preoccupation with

weight and body image dissatisfaction (Herzog, 1982; Russell, 1979).

Depression, low self-esteem, and suicidal thoughts and gestures are also common among bulimics (e.g., Shatford & Evans, 1986; Katzman & Wolchik, 1984; Pyle, Mitchell, & Eckert, 1981; and Crowther & Chernyk, 1986). Additionally, a generalized pattern of impulsive behavior, which may include excessive use of alcohol and/or drugs, stealing, and sexual promiscuity is also found among individuals with this disorder (e.g., Pyle, et al., 1981; Johnson, Stuckey, Lewis, & Schwartz, 1982; and Russell, 1979).

Complications

Malnutrition, which is present in approximately 20% of bulimics, is one of the complications of the disorder (Bauer, Andersen, & Hyatt, 1986); often resulting in a disruption of normal hormonal secretions that can effect the reproductive system and result in hair loss, brittle nails, fatigue, insomnia, weakness and mood changes (Bauer, et al., 1986).

Specific physical symptoms and problems are also related to binge eating. These include abdominal distention, nausea, headaches, dizziness, paresthesia, and occasionally, gastric rupture (Bauer, et al., 1986).

Self-induced vomiting also adversely affects the body in several ways. For example, Johnson and Conners (1987) cite fluid loss and dehydration, excessive thirst, decreased urinary output, and dizziness as complications associated

with vomiting. Additional symptoms include infected glands, blisters in the throat, internal bleeding, hypoglycemia, icy hands and feet, and possible rupturing of the stomach or esophagus (Hull & Cohn, 1986). Finally, dental complications may result from chronic exposure to gastric acid (Dippel & Becknal, 1987).

Etiology

Although the exact etiology of bulimia remains unknown, several theories exist. These theories share similarities, but at times appear to conflict. The following is a brief overview of several theories concluding with a more detailed look at the cognitive theory of bulimia.

First, psychoanalytic theory proposes that bulimics are often "ideal children" who go out of their way to please their parents. The child may be loved for not needing to be nurtured and out of these unfulfilled needs, insecurities develop surrounding appearance, competence, and the ability to be loved (Hall & Cohn, 1986). Bulimia is the chosen escape because eating provides instant relief from painful feelings without having the negative effects of other escape-mechanisms such as drugs.

A closely related theory proposed by Strober and Humphrey (1987) states that the family environment to which bulimics are exposed hampers the development of a stable identity, autonomy, and self-efficacy. This occurs via a cluster of disturbed patterns of relating and interacting

that are characterized by enmeshment, poor conflict resolution, emotional over-involvement or detachment, and a lack of affection and empathy.

Sociocultural theory (Dippel & Becknal, 1987) asserts that social pressures on females to be thin are the cause of bulimia. Several studies (e.g., Shisslak, Crago, Neal, & Swain, 1987) have stated that thinness in women is associated with greater attractiveness and femininity. Research has pointed to the media as a major contributor to these attitudes (Hall & Cohn, 1986).

Biological factors have also been implicated in the development of bulimia. The endocrine system, controlling cortisol and thyroid, is theorized to be at the root of bulimic behavior (Dippel & Becknal, 1987). Alterations of noradrenergic physiology have also been implicated as causal factors in bulimic behavior (Emmett, 1985). This model suggests that binge eating is triggered by increased norepinephrine that results from the individual's prolonged attempts to adhere to strict dieting.

Next, behavioral theory states that bulimic behavior is developed and maintained via positive and negative reinforcement. Reinforcing consequences of binge eating and purging include the ingestion of fattening foods without the fear of weight gain (Russel, 1979). Additionally, bulimic behavior may be used to reduce stress or boredom or as a method of avoiding personal problems (Dippel & Beckman,

1987). Other behavioral theorists maintain that bulimia is learned as a result of a number of failed diets (Shisslak, et al., 1987).

Finally, cognitive theorists point to abnormal attitudes and beliefs regarding weight regulation as a leading factor in the development of bulimia (Fairburn, 1984). Bulimics are thought to believe that their shape and weight are fundamentally important to their self-worth and must be kept under strict control. This preoccupation then leads to strict dieting and the development of rigid, unrealistic, cognitions regarding eating behavior and weight. Extreme dietary restraint may trigger binge eating, which violates the cognitive standards the bulimic maintains (Fairburn, 1984). Obsessed with the fear of gaining weight, bulimics learn to cope with binges by vomiting (Wilson, Rossiter, Kleifield, & Lindholm, 1986).

In terms of maintenance of bulimia, cognitive distortions appear to be important factors (Garner & Bemis, 1982). Dichotomous thinking, superstitious thinking, overgeneralization, magnification, and selective abstraction are all forms of distortions that can prove to be problematic for the bulimic when they are applied to eating behavior and weight. For example, dichotomous thinking can lead to rigid distinctions between "good" and "bad" foods or "being on a diet" and "blowing it." This type of thinking may lead the bulimic to believe that they have eaten "too much" (even

after eating a "normal" amount of food), and thus may result in continued eating (because they have "lost control"), and eventually terminate in purging behavior. Because these cognitive distortions are especially likely to influence a bulimic's behavior in times of stress (Wilson, Rossiter, Kleifield, & Lindholm, 1986), coupled with the fact that control has been reported to be an important issue for bulimics (Katsman, 1989), the present study will focus on appraisal of control in stressful and nonstressful situations.

Stress and Bulimia

Several studies have focused on the role of stress in the etiology and maintenance of bulimia (e.g., Soukup, Beiler, & Terrell, 1990). Unfortunately, the literature in this area is often contradictory, making it difficult to ascertain the extent to which stress is associated with bulimia (Cattanach & Rodin, 1988). The following sections will examine research concerning the number of stressors, as well as the types of potential stressors encountered by bulimics.

Number of Potential Stressors Experienced by Bulimics

One hypothesis regarding the relationship between stress and bulimia is that bulimics may be exposed to a greater number of potential stressors than other individuals (Cattanach & Rodin, 1988). Greenberg (1986) found that bulimics reported experiencing a significantly greater number

of stressful life events during a one-month period than a group of noneating-disordered individuals. Further, examining subjects' perceptions of these life events revealed that bulimics perceived their impact to be greater than did subjects in the control group.

Another study investigating this hypothesis indicated that bulimics reported greater amounts of stress than controls in a study using the Life Experiences Survey (Soukup, Beiler, & Terrell, 1990). In the same study, bulimics were also shown to obtain significantly higher scores than controls on the Driven Behavior and Time Pressure subscales of the Derogatis Stress Profile.

Further support for the notion that amount of stress is involved in the etiology and maintenance of bulimia is highlighted in a study carried out by Lingswiler, Crowther, & Stephens (1989). These researchers investigated seven antecedents (including stress) to a binge-purge cycle in a group of bulimics. Results indicated that prior to binge episodes, the bulimic group reported significantly greater levels of stress (as well as more negative moods and greater thoughts of food) than binge eaters (individuals who binge but do not purge) reported prior to their binges and noneating-disordered controls reported prior to all eating episodes.

Onset of bulimia in a group of normal-weight bulimics studied by Lacey, Coker, and Birtchnell (1986) was also found

to be correlated with the occurrence of a greater number of stressful events. Fifty-six percent of these individuals reported multiple stressful events as precipitating factors in the development of their disorder, including sexual conflicts, major changes in life circumstances, and losses.

Contradictory results pertaining to the relationship between stressful life events and bulimia, however, have been found. Weiss & Ebert (1983) compared a group of normal-weight bulimics with a sample of normal-weight controls on a variety of measures, including incidence of life stress. Results indicated that the two groups did not differ on the number of stressful events reported on the Holmes and Rahe Social Readjustment Rating Scale.

Due to the self-report nature of these studies, it makes it difficult to determine conclusively whether, and/or to what extent, a greater number of life stressors is correlated with the etiology and maintenance of bulimia (Cattanach & Rodin, 1988).

Types of Stressors Experienced by Bulimics

Although some research findings suggest that specific types of stressful events are linked to bulimia, there is no evidence to date that indicates that any particular type of stressor is experienced solely by women who develop bulimia (Cattanach & Rodin, 1988). However, the onset of bulimia has been linked to the following events: loss (reported by 20% of subjects), major change in life circumstances (reported by

70% of subjects), and sexual conflicts (reported by 72% of subjects) (Lacey, et al., 1986). These researchers also discovered that patients described the presence of three to four of the following chronic stressors in their lives: poor relationships with parents (reported by 60% of subjects), doubts surrounding femininity (reported by 78% of subjects), academic strivings (reported by 46% of subjects), parental marital conflict (reported by 44% of subjects), and poor peer group relationships (reported by 28% of subjects).

Bulimic outpatients interviewed in a study conducted by Pyle, Mitchell, and Eckert (1981) often indicated that the onset of their disorder had been associated with the occurrence of a traumatic event. These events included loss or separation from a significant person, interpersonal conflict, and alterations in sexual relationships or behaviors.

In a sample of female college undergraduates who met diagnostic criteria for bulimia, depression, as well as events such as moving away from home to attend college or breaking up with a boyfriend were found to be sources of stress that precipitated the development of bulimia (Shatford and Evans, 1986). In terms of perpetuation of bulimic behavior, Lacey and his colleagues (1986) found that social stressors such as being teased about weight, emotional distress, and difficult interpersonal interactions often preceded discrete binge-purge episodes.

On the other hand, Weiss and Ebert (1983) found no evidence that the types of stressful events reported by bulimics differed from those reported by noneating-disordered controls. Additionally, only 13% of bulimics sampled by Johnson and his colleagues (1982) reported stressful events such as loss, interpersonal conflict, or separation as precipitating factors in their disorder.

Because of the conflicting studies and the fact that even those studies supporting the notion that particular stressors are associated with the onset of bulimia did not find atypical stressors nor a single type or category of stressors, it seems prudent to suggest further examination and clarification.

The Transactional Stress Model

Although studies examining the relationship between stressful life events and bulimia have not found consistent results, it is probable that a portion of the confusion can be the result of the failure of the stress-bulimia literature to keep abreast with the advancements in the conceptualization and measurement of stress. A recent reconceptualization of stress by Lazarus and his colleagues appears to be particularly promising. Lazarus and Folkman (1984) have conceptualized stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her well being" (p. 19). Stress, according to this model,

consists of a transaction between an external stimulus and an individual's response. Lazarus and Folkman (1984) have identified two processes that mediate the person-environment relationship: cognitive appraisal and coping.

Cognitive appraisal is identified by Lazarus and Folkman (1984) as "an evaluative process that determines why and to what extent a particular transaction or series of transactions between the person and environment is stressful" (p. 19). Coping is defined as "the process through which the individual manages the demands of the person-environment relationship that are appraised as stressful and the emotions they generate" (Lazarus & Folkman, 1984, p. 19).

Appraisal and Bulimia

Bulimics may tend to appraise potential stressors differently from other individuals. In an examination of psychosocial components of the stress process in bulimia, Cattanach and Rodin (1988) suggest that bulimics may tend to view stressors as being more stressful, less predictable, less controllable, or less desirable.

Further, some evidence also suggests that bulimics' frequency of binge-eating episodes increases during situations that are perceived as more stressful. For example, Wolf and Crawther (1983) looked at predictors of binge eating among undergraduate women and found that individuals who perceived experiencing greater levels of stress were those who reported greater severity of binge

eating. However, this study also reported that the amount of stress accounted for only 6.3% of the total binge score variance. Thus, it is difficult, based on the findings of this study to conclude that binge eating is the result of differential perception of stressors by binge eaters.

Heilbrun and Bloomfield (1986) compared females with anorexic tendencies and females with bulimic tendencies on measures of impulse control and internal scanning. Results indicate that bulimics displayed impaired internal scanning, which leads to a failure to use information that may illuminate a wide range of options. The researchers suggest that this result may indicate a deficiency in the ability to review and consider alternatives, which may in turn, result in reduced self-control and increased binge eating (Heilbrun & Bloomfield, 1986).

In a study comparing cognitive functioning in bulimic and noneating-disordered controls, the bulimic group was found to posses a lower sense of general efficacy in terms of daily functioning, as well as reduced expectations for future success compared to controls (Etringer, Altmaier, & Bowers, 1989). The authors of this study hypothesize that bulimics who appraise their coping abilities in this fashion would have a difficult time learning and incorporating novel and more effective coping skills into their lives.

Recently, Neckowitz and Morrison (1991) compared coping strategies of normal weight bulimic women to those of a

noneating-disordered control group in stressful intimate and nonintimate situations. Subjects were asked to write about two recent stressful situations: one involving an individual they knew intimately, and one concerning someone they did not know intimately, and then answer questions regarding how they coped with the situations. Results indicated that the bulimic and control groups appraised the intimate and nonintimate situations in similar ways. However, the bulimic group appraised both situations as more threatening and used escape-avoidance more than did the control group. Thus it appears that the bulimic women did not fully and carefully consider their appraisal of the situation; rather, they moved immediately from arousal to coping (Neckowitz & Morrison, 1991).

Perhaps the findings of the studies discussed above suggest that bulimics do not consider themselves able to exert control over many situations. This, in turn, may lead these individuals to appraise the situations as more stressful than nonbulimics. It is possible that this process may result in the use of ineffective coping strategies, which may perpetuate the process of diminished perception of control and elevated appraisal of stress for the bulimic.

Control and Bulimia

Bulimics may perceive themselves as not being in control of things that occur in their lives. Under stressful conditions, these individuals may appraise the situation as

more stressful than others do, feel unable to control the environment, and subsequently respond to such feelings by binging and purging (Cattanach & Rodin, 1988). It has also been suggested that bulimics use binging and purging, rather than other coping strategies, as coping mechanisms when things seem stressful or as a way to manage emotions when environmental conditions appear out of control (Cattanach & Rodin, 1988).

Several studies have found that individuals with bulimia are more likely to have an external locus of control. For example, Shatford and Evans (1986) conducted a study of the stress process in undergraduate female bulimics. These researchers found, that the bulimic subjects endorsed an external locus of control, suggesting they were more apt to view events in their lives as not being within the realm of their control.

A group of normal-weight women who met diagnostic criteria for bulimia and a group of normal-weight controls were compared on a variety of psychological measures, including the Nowicki-Strickland Locus of Control Scale (Weiss & Ebert, 1983). Results indicated that the bulimics scored significantly lower than the controls on this measure, suggesting the bulimics believed they did not have mastery over their lives, rather that outside forces such as chance or powerful others were the controlling factors in their lives. Similar results regarding external locus of control

were presented by Carter and Easton (1983) in a study of undergraduate females with bulimia, as well as in a study of college binge eaters (Dunn & Ondercin, 1981).

Etringer, Altmaier, and Bowers (1989) examined the cognitive functioning of bulimic and nonbulimic females. They discovered that the bulimic group had a lower sense of general efficacy with regard to daily functioning, as measured by the Attributional Style Questionnaire. The bulimics also obtained lower scores on the The Generalized Expectancy for Success Scale than controls, reflecting lowered expectations of future success.

Final support for the notion that bulimic individuals have a lowered sense of control than noneating-disordered individuals comes from a 1989 study conducted by Katzman. She examined the relationship between stress and eating in a group of bulimics, as well as in a group of nonbulimic controls. Results indicated that the stress levels of the bulimics were lowered just prior to eating. The author suggests that the bulimic individuals used binge eating and purging as a "method of providing a sense of control and predictability in a world they tend to view as confusing and uncontrollable" (Katzman, 1989, p. 85).

The Present Study

The present study was designed to assess bulimics' perceptions of control in stressful and nonstressful situations. To meet this goal, I used the contingency

judgement task described by Alloy and Abramson (1979) (See Method). Unlike previous research investigating appraisal of control in bulimics, the present study involved an in vivo behavioral task. It was hoped this methodology would avoid the problems associated with self-report, questionnaire data. Also in contrast to previous research in this area, the present study measured perception of control in a specific stressful and less stressful situation. Past studies have typically assessed global perceptions of control, where it is possible that memory consolidation and other forms of bias may affect a bulimics' response set. Perhaps it is easier for bulimics to provide a more accurate description of their level of control when faced with a specific situation under relatively less stressful conditions. It was hypothesized, however, that the bulimic group would perceive themselves as having less control than the noneating-disordered controls in both the stressful and nonstressful conditions. Behavioral involvement, or the number of trials on which subjects press, has been shown to be a mediating factor in this task (Kearney, Holm, & Kearney, 1994), therefore, the subject sample was also divided into high and low pressers prior to data analysis. Finally, since depression has been shown to effect the tasks used in this study, subjects in the bulimic and control groups were matched on self-reported level of depression.

METHOD

Subjects

Subjects (N=60) were solicited from the population of undergraduates enrolled in psychology courses at the University of North Dakota during the 1993-1994 academic year. Only females were invited to participate. The decision to use females stemmed from the fact that 95% of bulimics are female (Hall & Cohn, 1986). Subjects were placed into one of two groups during the screening process: (a) subjects who met DSM-III-R (American Psychiatric Association, 1987) criteria for bulimia (n=30) and (b) non-eating disordered controls (n=30). The groups were matched on level of depression based on subjects' responses to the Beck Depression Inventory (Beck, Ward, Medelson, Mock, & Erbaugh, 1961; Beck, Rush, Shaw, & Emery, 1979). All subjects received course credit in return for their participation and were treated in accordance with the guidelines pertaining to human subjects within the "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 1992).

Screening

Approximately 1000 students enrolled in undergraduate psychology classes during the fall and spring semesters of

the 1993-1994 academic year completed the initial screening questionnaires. The bulimia questions from the Structured Clinical Interview For DSM-III-R (SCID) (Spitzer, Williams, Gibbon, & First, 1990) were used to identify individuals who met the following diagnostic criteria for bulimia: a) recurrent episodes of binge eating (rapid consumption of a large amount of food in a discrete period of time); b) a feeling of lack of control over the eating behavior during the eating binges; c) regularly engaging in either self-induced vomiting, use of laxatives or diuretics, strict dieting or fasting, or vigorous exercise in order to prevent weight gain; d) a minimum average of two binge eating episodes a week for at least three months; and e) persistent overconcern with body shape and weight.

The anorexia nervosa questions from the SCID were also completed during the screening process to ensure that individuals with a history of anorexia were not included in the study. Those who met the following diagnostic criteria were excluded: a) refusal to maintain body weight over a minimal normal weight for age and height; b) intense fear of gaining weight or becoming fat, even though underweight; c) disturbance in the way in which one's body weight, size, or shape is experienced (e.g., "feeling fat" when clearly underweight); and d) absence of at least three consecutive menstrual cycles when otherwise expected to occur. Subjects who met DSM-III-R criteria for bulimia were contacted by a

graduate student in clinical psychology and invited to participate in the study.

Design

A 2 (Eating Disorder Status) X 2 (Stress Level) X 2 (Problem Type) mixed factor design was used in the present study. Eating Disorder Status was a between-subject factor, in which subjects were assigned to groups (Bulimic or Control) based on results from the previously described screening process. Stress level was a between-subject condition that included a non-stressful condition in which the standard directions of the task were presented, and a stressful condition in which a statement was added to the task instructions that suggested an individual's ability to solve the experimental problem was related to intelligence. Problem Type was a within-subject factor with subjects assigned to both 25-25 and 75-75 conditions, in a counterbalanced fashion. The first number of each problem denotes the percentage of trials on which the outcome of interest (green light onset) occurs when the subject presses the button. The second number denotes the percentage of trials on which the green light onset occurs when the subject chooses not to press the button. The degree of control (contingency) was determined by the difference between these two numbers. In both problems subjects had 0% control.

Materials

Structured Clinical Interview for DSM-III-R (SCID)

The bulimia and anorexia questions from the Structured Clinical Interview for DSM-III-R (Spitzer, et.al., 1990) were used to identify individuals who met diagnostic criteria for bulimia, as well as to screen out individuals with a history of anorexia nervosa. The questions assess each diagnostic criterion for the respective disorders. Subjects answered "yes" or "no" to each question and were asked to provide additional information (e.g., weight) on certain items if the item was positively endorsed.

Beck Depression Inventory (BDI)

The Beck Depression Inventory (Beck, Ward, Medelson, Mock, & Erbaugh, 1961; Beck, Rush, Shaw, & Emery, 1979) is a standard 21-item device used to screen for and measure the severity of depression. Each item is rated on a 4-point scale (0-3) of intensity. Scores range from 0-63, with the higher scores indicating greater severity of depression. The two subject groups were matched according to depression level.

Stress Rating Scale

The Stress Rating Scale, a one item likert-type scale, was used as a manipulation check for the independent variable of stress. This question asked subjects to rate the degree of stress they experienced (on a scale of 1-10) during the experiment.

Judgement of Control Scale

The Judgement of Control Scale (Abramson & Alloy, 1979) asked participants to rate the degree of control they thought they had over the experimental outcome (green light onset). This scale is marked off in units of five with extreme values of 0 (labelled No Control) and 100 (labelled Complete Control). The 50% point is labelled Intermediate Control. A second question assessed how sure the subjects were concerning their estimate of degree of control. This question also used a scale marked off in units of five with extreme values of 0 and 100, which were labelled as Completely Unsure and Completely Sure, respectively (See Appendix A).

Judgement of Total Reinforcement

The Judgement of Total Reinforcement Scale (Abramson & Alloy, 1979) had subjects estimate the overall percentage of trials in which the green light came on regardless of their response (pressing or not pressing). This scale is marked off in units of five with extreme values of 0 and 100. A second question assessed how sure the subjects were concerning their estimate of the overall percentage of trials on which the green light came on regardless of which response they made. This question also used a scale which was marked off in units of five with extreme values of 0 (labelled as Completely Unsure) and 100 (labelled as Completely Sure) (See Appendix B).

Judgement of Reinforcement if Press

The Judgement of Reinforcement if Press Scale (Abramson & Alloy, 1979) assessed whether participants were aware of the data necessary to compute the conditional probabilities that were required for making an accurate judgement of control. Subjects were asked to estimate the percentage of trials on which the green light came on when they pressed the button. This scale was marked off in units of five with extreme values of 0 and 100. A second question assessed how sure the subjects were concerning their estimate of the overall percentage of trials on which the green light came on when they chose to press. This question also used a scale which was marked off in units of five with extreme values of 0 and 100 (labelled as Completely Unsure and Completely Sure respectively) (See Appendix C).

Judgement of Reinforcement if No Press

The Judgement of Reinforcement if No Press Scale (Abramson & Alloy, 1979) also assessed whether participants were aware of the data required to compute the conditional probabilities that were necessary for making an accurate judgement of control. Subjects estimated the percentage of trials on which the green light came on when they did not press the button. This scale was marked off in units of five with extreme values of 0 and 100. A second question assessed how sure the subjects were concerning their estimate of the overall percentage of trials on which the green light came on

when they chose not to press. This question also used a scale which is marked off in units of five with extreme values of 0 (labelled as Completely Unsure) and 100 (labelled as Completely Sure) (See Appendix D).

Apparatus

The present study was conducted in a room in which the subject and the experimenter were separated by a screen. Standard switching relay circuitry for controlling stimulus presentation and recording subjects' responses were housed in the observation portion of the room. Participants were seated in the experimental portion of the room in such a way that they could not see the experimenter.

The stimulus presentation consisted of a grey wooden platform on which a red and green light were positioned facing the subject. The subject's response mechanism consisted of a spring-loaded lever that was mounted in the front of the same platform.

Procedure

Upon reading and completing the study's consent form, participants completed the Beck Depression Inventory. They were then seated at a table on which the apparatus for the contingency learning problem was mounted. The instructions for the various conditions were identical, with the exception of the statement linking successful mastery of the task to the participant's intelligence level in the stressful condition. Each subject completed both the 25-25 and 75-75

problems. Half of the participants in each cell of the design received the 25-25 problem first, while half completed the 75-75 problem first.

Both of the contingency problems consisted of 40, three-second trials on which the subject had the option to press or not press a button. Illumination of a red light signaled the start of each trial. At the end of the three-second trial a green light was either presented or not presented dependent on the subject's response (the green light was presented in a random fashion based on when the subject pressed or did not press the button) and the contingency problem to which the subject was randomly assigned. Subjects in the stressful condition were read the following statement prior to receiving the standard directions: "The task you will be completing today measures your ability to problem solve. Problem solving ability has been shown to be linked to intelligence level, therefore, you will be able to learn something about your intelligence level based on how easy or difficult it is for you to solve the problem". All participants were given the following instructions (Abramson & Alloy, 1979):

> Now in this problem-solving experiment, it is your task to learn what degree of control you have over whether or not this green light comes on. Each time the red light comes on indicates the start of a new trial, the occasion to do something. For each trial, after the red light comes on, you have the option of either making a button-press response or not making a button-press response. A button-press response consists of pressing this button once and only once immediately after the red light comes on. Not making a button-press response

consists, of course, of doing nothing when the when the red light comes on. If you do intend to press the button on a given trial, you must press within three seconds after the red light comes on; otherwise the trial will be counted as a not-press trial. So, in this experiment, there are only two possibilities as to what you can do on each of the trial: either press the button within three seconds after the red light comes on or else just sit back and do nothing. Any questions so far? So, there are four possibilities as to what may happen on any given trial: 1) you press and the green light does come on; 2) you press and the green light does not come on; 3) you do not press and the green light comes on 4) you do not press and the green light does not come on. Since it is your job to learn how much control you have over whether the green light comes on, as well as whether the green light does not come on, it is to your advantage to press on some trials and not press on others so you know what happens when you do not press as well as when you do press. Any questions?

When it was clear that the subject understood the outline of the task, she was then be shown the Judgement of Control Scale and the concept of control was discussed briefly:

Forty trials will constitute the problem. After the problem, you will be asked to indicate your judgement of control by putting an "X" somewhere on this scale; at 100 if you have complete control over the onset of the green light, at 0 if you have no control over the onset of the green light, and somewhere between these extremes if you have some but not complete control over the onset of the green light. Complete control means that the onset of the green light on any given trial is determined by your choice of responses, either pressing or not pressing the button. No control means that you have found no way to make response choices so as to influence in any way the onset of the green light. Another way to look at having no control is that whether or not the green light comes on on any given trial, is totally determined by factors such as chance or luck, rather than by your choice of pressing or not pressing. Intermediate degrees of control means that your choice of responses, either pressing or not pressing, influences the onset of the green light even though it does not completely determine whether the green light goes on or not. Another way to have intermediate control is that one response, either pressing or not

> pressing, produces the green light onset more often than does the other response. So, it may turn out that you will have no control, that is your responses will not effect the onset of the green light, or it may turn out that you will have some degree of control, either complete or intermediate. Any questions before we begin? (Subjects in the stressful condition will be read the following statement prior to the beginning of the task "Remember now that it is important that you do as well as you can, we are interested in how well you can do on this problem solving test of intelligence").

The experimenter then left the room and the subject proceeded with the contingency learning problem. At the end of the 40 trials, the experimenter returned and reread the section of the instructions discussing the concept of control. The subject then completed each of the four judgement scales by placing an "X" on the scale corresponding to her estimate. The participant then completed the second problem and filled out the judgement of control scales. Finally, all subjects were debriefed (participants in the stressful condition were informed that the problems were not a measure of intelligence) and provided with a record of their participation.

RESULTS

Overview of Analyses

These analyses were designed to address the following questions: a) do bulimics differ from noneating-disordered controls on estimates of: control, overall percentage of time the green light came on, percentage of time the green light came on when the subject pressed the button, and the percentage of time the green light came on when the subject did not press the button; b) do bulimics differ from non-eating disordered controls on degree of certainty regarding the above-mentioned estimates; and c) does the amount of perceived stress effect either groups estimation of control or certainty. As mentioned previously, behavioral involvement was also examined as a mediating factor. Therefore, subjects were divided into groups of high and low pressers using a median split prior to the main analyses. To address the above questions, Multivariate Analyses of Variance (MANOVA's) were first used to determine if any statistically significant differences existed between the groups on any of the estimates. Subsequent univariate Analyses of Variance (ANOVA's) were used to further examine group differences. Tests of simple main effects and/or Tukey's Post Hoc Tests were then conducted to decompose any

significant univariate differences. Prior to examining any stress-related differences between the groups, a t-test was performed to first determine if the stress manipulation was successful, that is, if the subjects in the stressful condition rated their perceived stress level as greater than those subjects in the nonstressful condition.

Preliminary Analyses

Beck Depression Inventory Scores

Because depression has been shown to be a mediating factor in performance with the present experimental task, level of depression was matched for the two groups. A t-test revealed that no significant difference existed between level of depression reported by the bulimics and noneating-disordered controls [t (1,58) =.02, p = .982].

Stress Manipulation Check Scores

A t-test was performed to determine if subjects in the stressful condition reported higher stress ratings than subjects in the nonstressful condition. Unfortunately, results indicated there was not a significant difference in stress ratings between the conditions [t (1,58) =.20, p = .840]. Because no difference existed between subjects' ratings of stress, subsequent analyses did not include the stress condition to which subjects were assigned.

Contingency Analyses

Judgement Scales

A mixed MANOVA using Eating Disorder Status and Pressing Status as between-subject factors and Problem Type as a within-subject factor was performed using the following estimates as dependent variables: Judgement of Control (Control), Judgement of Overall Percentage of Time the Green Light Came On (Overall), Judgement of Percentage of Time the Green Light Came on When the Subject Pressed the Button (Green Light Press), and Judgement of Percentage of Time the Green Light Came on When the Subject Did Not Press the Button (Green Light No Press). MANOVA revealed a significant interaction of Eating Disorder Status X Pressing Status [F (4,53) = 2.49, p <.05] and a significant main effect for Problem Type [F (1,56) = 80.88, p < .001]. No additional interactions or main effects were significant.

ANOVA's conducted to clarify the significant two-way interaction (Eating Disorder Status X Pressing Status) indicated significant univarite effects for Control [F (1,56) = 4.28, p.<.05] and Overall [F (1,56) = 4.59, p <.05]. Tests of simple effects, conducted to decompose the significant interactions, revealed that on Control, [F (1,56) = 7.41, p <.01] bulimics who pressed the button on 23 trials or less (low pressers) reported they had more control than did the noneating-disordered controls who were low pressers. Additionally, a significant effect for Control [F (1,56) =

5.46, $p < .05$] also revealed that noneating-disordered subjects who pressed on more than 23 trials (high pressers) indicated they had significantly greater control than non-eating-disordered controls who were low pressers. This effect was not present in the bulimic subjects (See Figure 1).

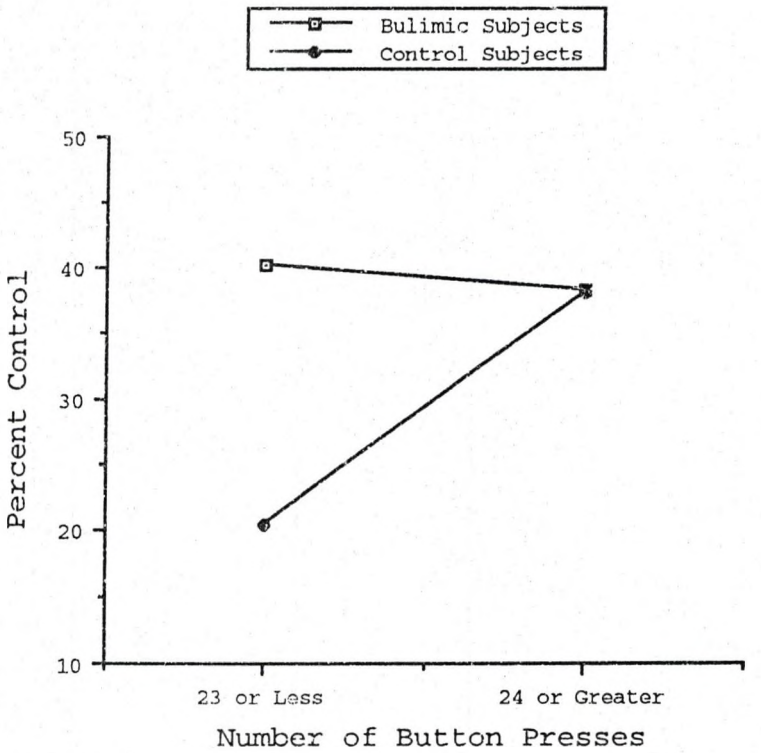


Figure 1. Eating Disorder-status by Pressing-status for Percent of Perceived Control

Tests of simple effects conducted to further illustrate results for Overall indicated a significant effect [F (1,56) = 5.05, $p < .05$] between bulimics and controls, but only for

low pressers. Low-pressing bulimics were found to report a lower overall percentage of green light onset than low-pressing, noneating-disordered controls (See Figure 2).

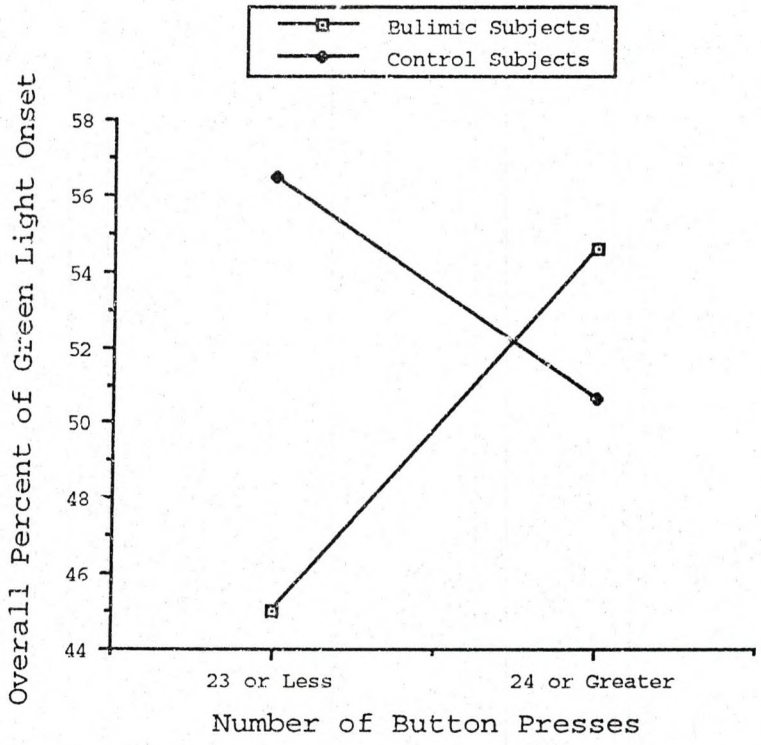


Figure 2. Eating Disorder-status by Pressing-status for Overall Percent of Green Light Onset

The significant multivariate effect for Problem Type demonstrates that subjects made differential judgements based on the problem type (i.e., 75-75 or 25-25). Subjects rated their degree of control as being significantly greater in the 75-75 condition (M = 51.25) than in the 25-25 condition (M = 19.16) [F (1,56) = 90.26, p <.001]. Similarly, subjects made

significantly higher estimates for Overall [F (1,56) = 80.46, p <.001], Green Light Press [F (1,56) = 235.26, p <.001], and Green Light No Press [F (1,56) = 5.56, p <.05] on the 75-75 problem than on the 25-25 problem. The final three differences would be expected, however, given the fact that in the 75-75 condition subjects are reinforced (green light onset occurs whether they press or not) 75% of the time, while in the 25-25 condition they receive reinforcement only 25% of the time.

Estimates of Sureness

A mixed MANOVA using Eating Disorder Status and Pressing Status as between-subject factors and Problem Type as a within-subject factor was performed using the estimates of sureness: Percent Sure Regarding Estimate of Control (Control-Sure), Percent Sure Regarding Estimate of Percentage of Time Green Light Came On (Overall-Sure), Percent Sure Regarding Estimate of Percentage of Time Green Light Came On When Subject Pressed the Button (Green Light Press-Sure), and Percent Sure of Estimate of Time Green Light Came On When Subject Did Not Press the Button (Green Light No Press-Sure). MANOVA revealed a significant main effect for Problem Type [F (4,53) = 3.76, p <.01] and Eating Disorder Status [F (4,53) = 4.55, p <.01]. No additional main effects or interactions were detected.

Univariate ANOVA's following the multivariate Problem Type effect revealed significant differences between the 75-

75 and 25-25 problems for Overall-Sure [F (1,56) = 7.27, p <.01]. Subjects reported greater degrees of certainty in the 75-75 problem (M = 70.16) than in the 25-25 problem (M = 62.08). A significant ANOVA was also found for Green Light Press-Sure [F (1,56) = 8.72, p <.01], with subjects reporting significantly greater degree of certainty in the 75-75 problem (M = 72.83) than in the 25-25 problem (M = 62.83).

Although a significant multivariate effect for Eating Disorder Status was detected, ANOVA's conducted to follow-up this result failed to yield statistically significant univariate findings.

DISCUSSION

Overview

The purpose of the present study was to investigate bulimics' perceptions of control in stressful and nonstressful situations using Abramson and Alloy's (1979) contingency judgement task. It was hypothesized that by using a behavioral task, as opposed to self- or clinician-report, appraisal of control in bulimia could be better understood. It was predicted that bulimic subjects would perceive themselves as having less control than the noneating-disordered participants in both the stressful and nonstressful conditions.

Preliminary Analyses

Analysis of the stress manipulation revealed that subjects in the stressful condition did not report experiencing a greater amount of stress than did subjects in the nonstressful condition. It is possible that the extensive amount of directions accompanying the task, overshadowed and therefore somewhat masked the solitary statement linking a subject's performance on the task to her intelligence. Perhaps subjects were focused on the task and what they needed to accomplish and subsequently did not recall or focus on the "stress-inducing statement." Another

potential explanation for this finding is that the participants were college students, who are repeatedly subjected to situations in which they feel their intellectual capabilities are being tested, thus the experimental task could have been a familiar situation to which they had already been desensitized. Finally, it may have been the case that the subjects did not see the experimental situation as a "true" test of their intelligence and therefore were not stressed by the experience.

It was also noted that the bulimics did not report greater stress levels than the noneating-disordered controls, as was expected. Although several studies have reported higher stress levels in bulimic individuals (e.g., Soukup, Beiler, & Terrell, 1990, Lingswiler, Crowther, & Stephens, 1989), it is important to note that these studies used global, self-report measures. Thus, it may be the case that as in the present study, when asked to rate stress level in a specific situation, bulimics are less inclined to report experiencing higher levels of stress than noneating-disordered individuals.

Judgement Scales

A significant interaction of Eating Disorder Status by Pressing Status was noted for the Control dependent variable. This result indicates that control subjects who pressed the button on more than 23 trials (high pressers) reported a higher degree of control over the green light onset than did

noneating-disordered controls who pressed 23 times or less (low pressers). In fact, control subjects who were low pressers rated their degree of control as significantly less than the bulimic participants who were low pressers. In other words, bulimics' perception of control remained fairly constant across low and high levels of pressing, while control subjects reported an increase in control with increased button pressing. It is plausible that for the bulimic subjects, an increase in behavioral involvement does not result in a heightened sense of control, due to their perception of the influence their behavior has on their environment. Bulimics may not view themselves as being able to control their lives, regardless of the amount of effort or the type of strategies they employ. This lack of success in controlling one's life circumstances or environment has been described as "learned helplessness" by Seligman and his colleagues (e.g., Maier & Seligman, 1976).

The basic premise of learned helplessness is that individuals learn that changes in their environment are not contingent on their behaviors. Therefore, they learn they are "helpless" to impact their environment. The fact that the bulimics did not alter their judgements of control with changes in their behavior (i.e., pressing the button) suggests that learned helplessness may be an important factor in understanding bulimics' behaviors.

The link between bulimia and learned helplessness has been demonstrated, to some extent, by previous literature examining appraisal of control in bulimics. These studies (e.g., Shatford & Evans, 1986; Weiss & Ebert, 1983; Carter & Easton, 1983) have shown that bulimics possess an external locus of control, or the view that factors outside of their influence are responsible for events in their lives. The results of the present study, linking bulimia with learned helplessness, takes the concept of appraisal of control a step further. Previous research in this area has reported generalized perceptions of control, while this study has examined the effect this world-view has on appraisal in a specific situation. Thus, this present study appears to point to the use of behavioral techniques as a method of fleshing-out the exact nature of bulimics' appraisal of control.

A significant interaction between Eating Disorder Status and Pressing Status was also found for the Overall dependent variable indicating that bulimics who were low pressers reported a lower percentage of overall green light onset than noneating-disordered controls who were low pressers. The actual percentage of green light onset, averaged across the 75-75 and 25-25 conditions is 50%. Green light onset, may, in this task be construed as a favorable outcome. Therefore, it could be hypothesized that both the bulimic and control subjects in the low press condition had distorted views of

green light onset, the "favorable" outcome. In the low press condition, control subjects held a positively skewed view of how often green light onset occurred, while the bulimic subjects held a more negative view. These findings suggest that bulimics are less likely to perceive their behavior as producing a positive outcome than noneating-disordered controls. This result is consistent with findings presented by Etringer and her colleagues (1989). These researchers found that bulimics reported a decreased expectancy for future success as compared to noneating-disordered controls on the General Expectancy for Success Scale.

A significant multivariate effect for Problem Type was also detected. Subjects rated their degree of control as significantly greater on the 75-75 problem than on the 25-25 problem. This result is consistent with past research (e.g., Abramson and Alloy, 1979). As mentioned previously, this result could be explained based on the notion of green light onset being viewed as a "favorable" outcome. Thus, in the 75-75 problem, where green light onset occurs 75% of the time when the subject presses the button, as well as, 75% of the time when the subject does not press the button, subjects may construe this greater occurrence of green light onset as more favorable. This may subsequently lead to the perception of greater control. Subjects completing the 75-75 problem also made significantly higher estimates of Overall, Green Light Press, and Green Light No Press. These results, as mentioned

previously, would be expected given the fact that participants completing the 75-75 problem receive reinforcement 75% of the time while those completing the 25-25 problem receive reinforcement 25% of the time.

Estimates of Sureness

A significant multivariate effect for Problem Type was found for Overall-Sure and Green Light Press-Sure. For each of these estimates, subjects completing the 75-75 problem reported higher degrees of certainty than when they completed the 25-25 problem. These results are consistent with findings presented by Kearney and his colleagues (1994). It is likely that if subjects viewed greater green light onset in the 75-75 condition as more favorable, they would also feel more certain that they were making accurate judgements of control, thus increasing their ratings of sureness.

Limitations and Conclusions

As is the case with any study conducted with an undergraduate population, the ability to generalize the results to other populations remains an empirical question. Although this study's bulimic subjects met DSM-III-R criteria for bulimia, they may have differed in other ways from a sample of bulimics seeking or already involved in treatment. Therefore, is is unclear to what extent generalizations can be made from this sample to patient populations. Finally, given the ineffectiveness of the stressful stimulus used in

the stressful condition, it would be helpful to replicate the study using a more stressful stimulus.

Recently, DSM-IV has been released, which further classifies bulimics into two types: purging and nonpurging. It may be useful to determine if this distinction is helpful in shedding light on the issue of appraisal of control in bulimia. Perhaps the more serious the symptoms of bulimia (i.e., those who purge rather than exercise excessively, for example), the more pronounced the perceived lack of control.

The present study failed to demonstrate that bulimic individuals would perceive themselves as having less control in a contingency judgement task than noneating-disordered controls. As mentioned previously, however, this is the first study to examine the appraisal of control in bulimics using an in vivo behavioral task. Previous research examining control issues in bulimia has used self-reports or clinician ratings. It is possible that given a specific situation, such as in the present study, bulimics may be less likely to report control deficits than if asked to give more global estimates of control. It may be the case that global estimates tap into memory distortions or biases that are avoided when considering a specific in vivo situation.

The most interesting finding in this study was that for the bulimic subjects, increases in behavioral involvement did not lead to increases in perceived control, as was the case in the noneating-disordered controls. This finding may be

explained using Seligman's learned helplessness theory. Perhaps a bulimic's perception of lack of control is related not to a lack of behavioral involvement, but rather to a failure to make a connection between behavior and the outcome of a situation. It is also important to note that bulimics who were less behaviorally involved (low pressers) under-reported green light onset, an event that could be viewed as favorable. It appears as though this group of bulimics may tend to view the world in a more negative light, which may have effects on a variety of cognitive processes, including perception of control.

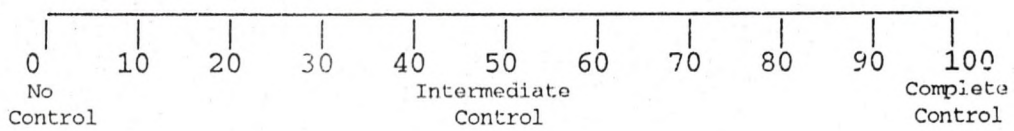
Finally, the present study extends the literature pertaining to the appraisal of control in bulimia. Examining perceptions of control in specific situations may prove to be a more effective method of measuring this construct than global self- or clinician-report measures. Further research in the area of appraisal of control in bulimia is definitely warranted. Additional studies using behavioral tasks need to be carried out to increase our understanding of the appraisal processes that are involved in this disorder. Studies that include an effective stress component may be especially helpful, as stress has been shown to play a central role in the maintenance of bulimic behaviors.

APPENDICES

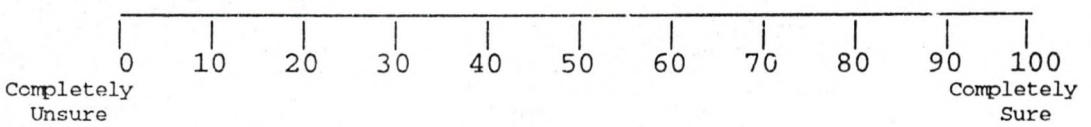
APPENDIX A

JUDGEMENT OF CONTROL SCALE

Place an "X" on the scale below indicating the degree (percent) of control that your responses (pressing and not pressing) exerted over the onset of the green light.



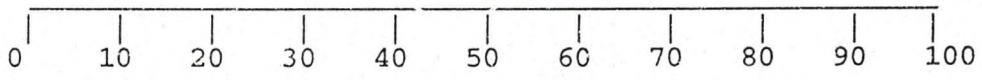
Place an "X" on the scale below indicating how sure you are concerning your estimate of degree of control over the onset of the green light (that is, how sure you are about how you answered the above question).



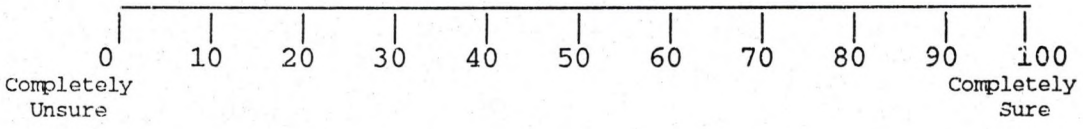
APPENDIX B

JUDGEMENT OF TOTAL REINFORCEMENT SCALE

Place an "X" on the scale below indicating the overall percentage of trials on which the green light came on regardless of which response you made (press and not press).



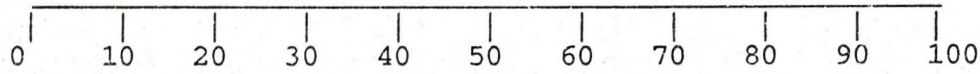
Place an "X" on the scale below indicating how sure you are concerning your estimate of the overall percentage of trials on which the green light came on (that is, how sure you are about how you answered the above question).



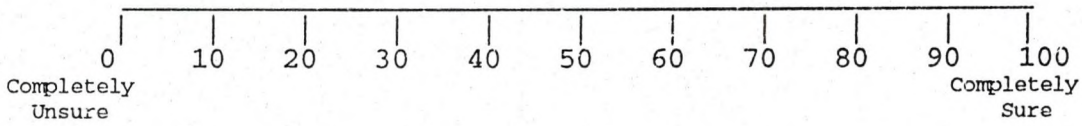
APPENDIX C

JUDGEMENT OF REINFORCEMENT IF PRESS SCALE

Place an "X" on the scale below indicating the percentage of trials on which the green light came on when you chose to press the lever.



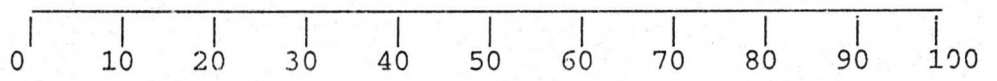
Place an "X" on the scale below indicating how sure you are concerning your estimate of the overall percentage of trials on which the green light came on when you chose to press the lever (that is, how sure you are about how you answered the above question).



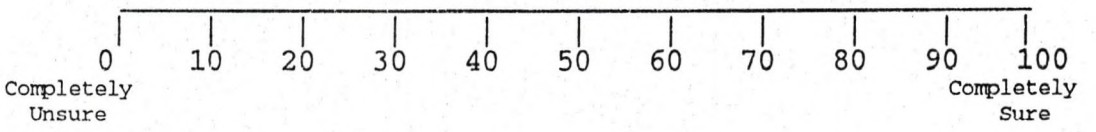
APPENDIX D

JUDGEMENT OF REINFORCEMENT IF NO PRESS SCALE

Place an "X" on the scale below indicating the percentage of trials on which the green light came on when you chose NOT to press the lever.



Place an "X" on the scale below indicating how sure you are concerning your estimate of the overall percentage of trials on which the green light came on when you chose NOT to press the lever (that is, how sure you are about how you answered the above question).



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