

EXPRESSIVE WRITING'S EFFECTS ON
DISINHIBITED EATING FOLLOWING
AN EGO THREATENING EVENT

By

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
July, 2007

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TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION.....	1
Obesity	3
Self-regulation of Food Intake	4
Expressive Writing.....	6
Statement of Problem.....	9
Significance of the Study	9
Research Questions	10
Research Hypotheses	11
Definition of Terms.....	12
Assumptions.....	13
Limitations	14
II. REVIEW OF LITERATURE.....	15
Introduction.....	15
Theoretical Perspectives on Overeating.....	17
Externality Theory	19
Psychosomatic Hypothesis.....	21
Restraint Theory.....	23
Ironic Processes	26
Escape Theory.....	28
Ego Threats	31
Escape as a Coping Strategy	37
Mood Following Disinhibited Eating	40
Self-awareness and Disinhibited Eating	41
High and Low Levels of THought	45
Expressive Writing.....	48
III. METHODOLOGY	56
Participants.....	56
Measures	57
Revised Restraint Scale.....	58
State Self-esteem Scale	58

Mood Rating Scale.....	59
Food Consumption.....	60
Linguistic Inquiry and Word Count.....	61
Procedure	63
Recruitment.....	63
Informed Consent.....	63
Deception	64
Experimental Procedures	67
Research Design and Statistical Analyses	73
Analyses of Covariance	73
 IV. FINDINGS.....	 76
Introduction.....	76
Statistical Analyses	78
Preliminary Analyses	78
Research Questions	80
 V. CONCLUSION.....	 86
Preliminary Analyses	87
Research Questions.....	87
Limitations of Study	98
Implications for Future Research.....	101
Implications for Practice	105
 REFERENCES	 107
 APPENDIX.....	 119

CHAPTER I

INTRODUCTION

Obesity is a risk factor for serious chronic illnesses such as type II diabetes and heart disease. In order to lose weight one must eat less and exercise more. Few people, however, realize that eating less also leads to overeating, which results in weight gain and obesity. This paradox may explain why 95% of those who lose weight regain it (Herman & Polivy, 2004). Research over the last few decades has indicated that food restriction often leads to disinhibited eating (Herman & Polivy, 1980). Individuals who restrict their food intake practice dietary inhibition on a constant basis. Therefore, disinhibited eating involves temporarily lifting the food restrictions one regularly maintains in an effort to lose weight. Disinhibited eating is characterized by feelings of letting go and giving in to temptation. Disinhibited eating occurs when dieters give in to eating in response to negative emotions that emerge as a result of an ego threatening event (Heatherton & Baumeister, 1991). An ego threatening event is one that leads to questioning the sense of self in a negative way (Engler, 2003). Ego threatening events are unpleasant because they result in negative emotions. Disinhibited eating helps dieters escape the aversive emotional experience that results from ego threatening events. When seeking to escape ego threatening negative emotions, dieters unknowingly and unintentionally escape self-awareness and higher levels of thought (Herman & Polivy, 2004). High level thoughts

are important to maintain because they are contextual and connected to past experiences and goals for the future, which may include weight loss goals. Self-awareness leads to maintenance of high level thought (Herman & Polivy, 2004). Both self-awareness and higher level thoughts maintain control over impulses. When dieters avoid self-awareness in an effort to escape aversive emotional experiences resulting from an ego threatening event, they escape high level thought. Escaping high level thought through escaping self-awareness is referred to as the “deconstructed state” because awareness becomes basic and simple (Heatherton & Baumeister, 1991). The individual in a deconstructed state draws all attention and awareness to basic sensory stimuli with little regard for the self, context, past events, and future goals (Heatherton & Baumeister, 1991). The deconstructed state leads to diminished ability to inhibit impulses including eating (Herman & Polivy, 2004).

In sum, an ego threatening event leads to an aversive emotional experience and a questioning of one’s sense of self. Dieters attempt to alleviate their discomfort due to the ego threatening event through escaping self-awareness. Self-awareness maintains high level thought which is goal oriented and contextual. Avoidance of self-awareness then leads to lower level thinking. Unfortunately, lower level thoughts tend to be impulse driven and for a dieter, impulses involve eating tempting foods in amounts that would normally be forbidden (Heatherton & Baumeister, 1991). When impulses override dietary restrictions, disinhibited eating occurs.

Since self-awareness is a key element in maintaining higher level thought and control over impulses, a potential treatment approach would be to ask dieters to increase awareness of their own thoughts and emotions. Providing a structured activity that leads

to increased self-awareness may provide chronic dieters with a technique that helps avoid temptation to overeat and remain connected to future weight loss goals. Expressive writing is an example of an intervention that may promote acceptance and experience of painful emotions and thoughts including negative feelings associated with ego threatening events (Pennebaker, 1995). Expressive writing usually involves writing for twenty minutes about a past trauma and has been shown to improve mental and physical health (Pennebaker, 1995). Expressive writing aids in emotional expression because it requires the writer to recognize her/his emotional state and describe it in words. The purpose of the present study is to examine the potential effectiveness of expressive writing as a technique for coping with ego-threatening events that lead to disinhibited eating. In the following sections of the paper I introduce the theoretical models the study is predicated prior to discussing them in detail in the review of the literature.

Obesity

Obesity has become one of the United States' most urgent health concerns in the last few decades. The National Center for Health Statistics reported in 1999 that approximately 61% of Americans could be considered overweight or obese. Overweight and obesity contribute to many of the major causes of death such as cardiovascular disease and cancer (Wadden, Brownell, & Foster, 2002). There are also social implications associated with obesity such as prejudice and discrimination. Those who seek treatment for obesity report higher rates of depression and anxiety than normal weight individuals and obese individuals who do not seek treatment. Research is needed

to better understand the causes as well as ways to treat this condition (Wadden et al., 2002).

Obesity is caused by an excessive positive energy balance, meaning the individual consumes more energy or calories than he or she expends (Mahan & Escott-Stump, 1996). To lose weight, one must consume fewer calories than the body requires. Unfortunately, consuming fewer calories than the body expends may create a psychological and physiological state that makes weight loss and inhibited eating quite difficult for many individuals to maintain. When calorie intake is reduced, metabolic changes occur that result in decreasing calorie needs to maintain body weight. Energy levels decline in the body's effort to conserve calories for survival, which makes exercise and activity more difficult; and taste perception changes occur making calorically dense foods more appealing (Herman & Polivy, 2004). Psychologically, the individual becomes vulnerable to overeating in certain situations, such as following calorically dense snack consumption (van Strien, Cleven, & Schippers, 1999), alcohol consumption (Ouwens, van Strien, & van der Staak, 2003), and negative affect onset (Meyer & Waller, 1999; Ruderman, 1985a; Schotte, Cools, & McNally, 1990).

Self-regulation of Food Intake

While some dieters are successful in restricting caloric intake and maintaining a desired body weight, a certain subpopulation of those dieters has difficulty maintaining food inhibition under certain circumstances. This subpopulation of dieters may make up a

large majority of the individuals trying to lose weight: 95% of the people who attempt to lose weight regain it (Herman & Polivy, 2004).

Inhibiting food intake requires self-regulation in that the person restricting caloric intake must ignore physiological cues and external cues that promote eating (Herman & Polivy, 2004). Self-regulation requires maintaining a high level of complex thought to inhibit the impulse to eat by also being mindful of future goals and consequences of overeating. The key to maintaining higher level complex thought is in self-awareness. Self-awareness can be painful and induce negative emotions at times. In an effort to disconnect from aversive self-awareness and the negative mood experience, dieters are thought to revert to low level thinking that is simplistic, spontaneous, and leads to behaviors driven by impulse, in this case disinhibited eating (Heatherton & Baumeister, 1991). In this view, the act of overeating may serve as a distraction or a source of comfort that allows the individual to escape negative emotion by offering strong sensory stimuli that the individual can focus their low level thoughts and attention (i.e., Heatherton & Baumesiter, 1991; Kahan, Polivy, & Herman, 2003; Vohs & Heatherton, 2000).

Support for the escape theory of disinhibited eating has been established by researchers who have shown that individuals who binge eat score high on avoidance coping measures (e.g., Freeman & Gil, 2004; Ghaderi & Scott, 2000; Paxton & Diggins, 1996; Schwareze, Oliver, & Handal, 2003). Other investigators have shown that ego threatening events are related to disinhibited eating (e.g., Baumeister, DeWall, Ciarocco, & Twenge, 2005; Heatherton, Herman, & Polivy, 1991; Heatherton, Striepe, & Wittenberg, 1998; Kahan et al., 2003; McFarlane, Polivy, & Herman, 1998). Researchers have also shown that dieters with low self-awareness eat less when directed to increase

self-focus (e.g., Baumeister et. al., 2005; Heatherton, Polivy, Herman, & Baumeister, 1993). Finally, escaping self-awareness has been found to be related to decreased thought complexity (Dixon & Baumeister, 1991). Disinhibited eating occurs following an ego threatening event and some researchers suggest decreased self-awareness and a desire to escape from negative emotions may mediate this relationship. However, more research needs to be done in this area to solidify these preliminary findings. Researchers also need to more definitively demonstrate the connection between decreased self-awareness and escaping negative emotions and decreased thinking level.

Expressive Writing

Expressive writing is a written emotional disclosure technique that involves writing about an assigned topic such as a past trauma for approximately 20 minutes (Pennebaker, 2004). Since the mid 1980's researchers have continued to find that expressive writing produces physical and mental health benefits for a variety of populations such as trauma victims (e.g., Pennebaker, 2004; Stephens, 2002), college students (e.g., Ullrich and Lutgendorf, 2002), and medical patients (Smyth, Stone, Horowitz, and Kaell, 1999). Unfortunately, although there is a considerable amount of evidence to support expressive writing's effectiveness, there is little understanding regarding the mechanisms involved (Esterling, L'Abate, Murray, & Pennebaker, 1999).

In the current study, expressive writing was used to assist in increasing self-awareness among college women chronic dieters and non-dieters. Brody and Park (2004) suggested that autobiographical narrative writing is a form of mindfulness that induces

heightened self-awareness. Others have used self-focused verbal disclosure to create a state of increased self-awareness (Heatherton et al., 1993). In one study investigators had participants write an essay about their own future goals to create a highly self-focused experience (Dixon & Baumeister, 1991). The present study focuses on expressive writing as a potential technique for increasing self-awareness among chronic dieters and non-dieters following an ego threatening event.

Although there is no one explanation for expressive writing's effectiveness there are many hypotheses. These hypotheses generally fall under one of three theoretical models: Pennebaker's emotional inhibition model, the cognitive adaptation model, or the exposure processing model (Sloan & Marx, 2004). Pennebaker (1995) has suggested that inhibiting emotions requires effort and increases stress levels. He believes that when individuals write or talk expressively about inhibited emotions, they lower stress levels that contribute to physical health problems. Expressive writing is particularly beneficial when individuals are asked to write about a past trauma (e.g., Bernstein, 2001; Francis & Pennebaker, 1992; Greenberg, Wortman, & Stone, 1996; Murray, Laminin, & Carter, 1989). Other expressive writing researchers believe that one of expressive writing's benefits may be that it functions as a type of exposure therapy (Sloan & Marx, 2004). The exposure therapy theory is the second major theory of expressive writing (Sloan & Marx, 2004). This theoretical model is based on basic learning theory in that expressive writing is seen as a way to repeatedly expose individuals to feared stimuli. It is believed that over time, the repeated exposure to emotionally painful but physically harmless memories will disconnect the learned association between memories of a past event and the fear the actual event evoked originally. The third theoretical model, which has been used to

explain the benefits of expressive writing, is the cognitive adaptation theory (Sloan & Marx, 2004). In this theory, expressive writing is seen as a way to promote information processing. Horowitz and Znoj (1999) suggest that until events perceived as incongruent with core beliefs are assimilated individuals will experience distress. Expressive writing may be a way to promote information processing and assist in integrating perceptions of life events and existing schema.

There are several reasons why expressive writing may help chronic dieters avoid disinhibited eating following an event that leads to decreased self-esteem in conjunction with lowered mood state. In essence an ego threat is an event that negatively leads to a questioning of one's sense of self. According to Pennebaker's emotional inhibition model, expressive writing may provide an outlet for expression of the negative emotions that result from the ego threatening event. Once the negative emotions are released they would not longer have negative psychological and physical consequences on the individual who experienced them. According to the cognitive adaptation theoretical model of expressive writing, expressive writing could help chronic dieters assimilate perceptions of an ego threatening event with core beliefs by facilitating information processing. Information processing may then help to prevent subsequent maladaptive behaviors such as disinhibited eating. According to the exposure processing model, expressive writing could help chronic dieters become desensitized to negative emotions and learn to accept them rather than escape them through eating. Additionally, expressive writing may help to facilitate increased self-awareness and complex level thought as verbal emotional disclosure following an ego threatening event has had this effect in the past (Heatheron et al., 1993).

Statement of Problem

Food restriction causes weight loss; however, for some, it also leads to disinhibited overeating and sometimes eating disorders. The relationship of food restriction to disinhibited eating may be a factor in the nation's increasing obesity epidemic. The ability to define the causes and possible interventions that can reduce the drive to overeat among chronic dieters may help to reduce rates of overweight and obesity.

The purpose of this study was to determine whether increasing self-awareness through expressive writing among college student female non-dieters and chronic dieters, who experienced a failure task (i.e., ego threatening event), would lead to reduced disinhibited eating. In this study, I also sought to identify the mental processes that occur during the time between the ego threatening event and the point at which the individual experiences disinhibited eating and the mental processes that occur after non-dieters and chronic dieters have eaten. Understanding these processes would help practitioners make treatment decisions.

Significance of the Study

While some researches have examined the effect of self-awareness on disinhibited eating, few researchers have examined the effect of self-awareness on disinhibited eating, and it seems that none have examined the effect self-awareness through *written* emotional

disclosure has on disinhibited eating. This information is significant because it contributes to a knowledge base that may provide guidance in the understanding and future treatment of overeating among those who struggle with restricting food intake and disinhibited eating. If increasing self-awareness through expressive writing helps prevent overeating, then this may be a practical intervention that can be utilized by chronic dieters. Also, learning that expressive writing is an effective means for increasing self-awareness would provide new information regarding the potential uses of expressive writing.

Understanding the emotional and thought processes that take place between the occurrence of an ego threatening event and initiation of eating among non-dieters and chronic dieters may lead to further understanding of the differences between these two groups during this time period. Last, understanding the emotional state following eating for chronic dieters and non-dieters may help guide future treatments of chronic dieting as well. Specific research questions addressed in this study are outlined below.

Research Questions

1. Are there group differences between chronic dieters and non-dieters on self-awareness (assessed with linguistic markers of self-awareness from the written text samples in the number of first person pronouns, negative emotion words, positive emotion words, cognitive mechanisms, and present tense verbs) following the failure task?

2. Are there group differences on cookie consumption following a failure task depending on writing topic (high self-awareness vs. low self-awareness) and dieting

status (chronic dieter vs. non-dieter; as assessed by Revised Restraint Scale scores) while controlling for the degree to which participants reported liking cookies during the interview?

3. Are there group differences on measures of negative mood (Mood Rating Scale), positive mood (Mood Rating Scale), or state self-esteem (State Self-Esteem Scale) following cookie consumption depending on dieting status (chronic dieters vs. non-dieters) and writing topic (high self-awareness vs. low self-awareness) while controlling for negative mood, positive mood, and state self-esteem scores obtained following the mood induction but prior to the writing task?

Research Hypotheses

1. There are no group differences between chronic dieters and non-dieters on self-awareness (assessed with linguistic markers of self-awareness from the written text samples in the number of first person pronouns, negative emotion words, positive emotion words, cognitive mechanisms, and present tense verbs) following the failure task.

2. There are no group differences on cookie consumption following a failure task depending on writing topic (high self-awareness vs. low self-awareness) and dieting status (chronic dieter vs. non-dieter; as assessed by Revised Restraint Scale scores) while controlling for the degree to which participants reported liking cookies during the interview.

3. There are no group differences on measures of negative mood (Mood Rating Scale), positive mood (Mood Rating Scale), or state self-esteem (State Self-Esteem Scale) following cookie consumption depending on dieting status (chronic dieters vs. non-dieters) and writing topic (high self-awareness vs. low self-awareness) while controlling for negative mood, positive mood, and state self-esteem scores obtained following the mood induction but prior to the writing task.

Definition of Terms

Binge eating: Eating unusually large amounts of food in a short period of time, usually less than two hours.

Chronic dieter: An individual who regularly restricts/inhibits their food intake on a regular basis in an effort to lose weight, but struggles with periods of disinhibited eating.

Dieter: A person who regularly restricts overall caloric intake to create a negative energy balance with resulting weight loss.

Deconstructed state: A cognitive state characterized by low level thinking, which is simplistic, immediate, and impulse driven. Heatherton and Baumeister (1991) report that the deconstructed state is, "...essentially a refusal of meaningful thought" (p. 94).

Disinhibited eating: Disinhibited eating is said to occur, when an individual, who routinely restricts their food intake either by restricting calories, types of foods, or entire food groups, temporarily rejects those food restraints and eats in response to internal

cues. Disinhibited eating can only occur among individuals who regularly practice dietary inhibition.

Ego Threat: Any event that leads to diminished state self-esteem and mood. In essence it threatens one's sense of self.

Expressive writing: Writing in a way that promotes emotional expression through emotional disclosure.

Overeating: Consuming more calories than the body expends.

Food Restraint/Restriction: Inhibiting internal and external cues to eat and instead eating in accordance with food rules as defined by chosen practices for losing weight.

Self-regulation: Inhibiting impulses for behavior, or an effort to behave differently than what one feels to be natural.

Assumptions

1. The participants voluntarily participated in the study and felt free to discontinue at any time without fear of negative consequences.

2. The measures used in this study were valid and reliable measures of chronic dieting status, negative and positive mood, and state self-esteem.

3. The women in the study reflected a representative sample of female chronic dieters and non-dieters found on large college campuses in the Southern Plains.

5. The true topic of the study was not recognized by participants so participant alterations in their natural behavior which may have invalidated the study outcomes were avoided.

6. Participants complied with instructions to avoid eating or drinking anything except water for 2-3 hours before their data collection appointment time.

7. Eating behavior during the research experiment was characteristic of eating behavior in daily living.

Limitations

1. Self-awareness was operationally defined in this study with linguistic markers including first person pronouns, present tense verbs, negative emotion words, positive emotion words, and cognitive mechanism words from samples of text that the participants provided. This operational definition of self-awareness has not been validated in previous research.

2. Participants may have learned or become suspicious of the real purpose of the study which may have influenced their behavior and responses.

3. Although participants were told to refrain from eating or drinking anything except water for at least 2-3 hours before their initial appointment, there was no guarantee participants would comply with these instructions.

4. The results from this study were based on responses from female, college students at a large Southern Plains university, and may not generalize to other populations.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The World Health Organization declared obesity a global epidemic because increasing obesity trends are present in most developed nations including the United States (Wadden et al., 2002). Chronic deadly illnesses such as type II diabetes, hypertension, heart disease, and some cancers are increasing proportionally to increases in overweight and obesity (Popkess-Vawter, Wendel, Schmoll, & O'Connell, 1998). Obesity related Medicare and Medicaid fees cost the United States around \$92.6 billion in 2002 (Finkelstein, Fiebelkorn, & Wang, 2003). Obesity not only impacts people medically and financially, but also psychologically and socially. Individuals who seek treatment for weight problems report higher levels of depression than normal weight individuals and face weight discrimination in our society (Wadden et al., 2002)). Often, chronic illnesses related to obesity lead to decreases in quality of life with increased physician visits, painful or unpleasant treatments, complicated medication regimens, and uncomfortable or painful symptomatology. Finding interventions and treatments to help reverse obesity and overweight begins with examining the causes for this problem.

Overweight and obesity result from an excessive positive energy balance. This

means metabolism (rate at which energy is utilized) is slower than the rate at which energy enters the body. When energy is not utilized, it is converted to fat and stored as adipose tissue. Conversely, when energy intake is unable to meet the body's metabolic demands, fat is broken down and converted to readily available energy. Causes for an excessive positive energy balance can occur on the cellular or metabolic level (e.g. hypothyroid disease, alterations in obesity related hormones, or genetic predisposition to obesity) or it can occur as a result of exogenous behavioral and psychosocial factors (e.g. an imbalance between activity levels and eating patterns) (Mahan & Escott-Stump, 1996).

Overeating, or consuming more calories than the body is expending, is a target for many obesity interventions. For reasons still being explored, individuals who attempt to lose weight by consuming fewer calories, while often simultaneously increasing activity levels, fail to maintain these behavioral changes long term. Studies show the long term maintenance rate for weight loss is somewhere between 3% and 5%, which means between 95% and 97% of those who attempt to alter their eating and exercise habits fail to maintain these changes (Assanand, Pinel, & Lehman, 1998; Popkess-Vawter et al., 1998).

Theoretically, overeating can be explained in a number of ways. Some researchers suggest overeating serves as a method for coping with emotion (Heatherton & Baumeister, 1991); other suggest overeating occurs when psychological defenses are down (Ward & Mann, 2000); and still others propose overeating is a result of the biological changes that take place when caloric intake is restricted (Herman & Polivy, 1980). In the following literature review, I will briefly examine pertinent psychological

theoretical explanations for overeating, but will specifically focus on the idea that individuals who overeat do so in response to an effort to inhibit or suppress negative emotions (Heatherton & Baumeister, 1991). I chose this perspective because Heatherton and Baumeister's (1991) theory of overeating is one of the most comprehensive and thorough theories of overeating and has a significant amount of research supporting it. I will present research findings and theoretical perspectives to provide the reader with a comprehensive overview of theory and research regarding overeating. I will also examine literature pertaining to expressive writing as expressive writing may function as a technique to counter the psychological effects that result from emotional inhibition or escape from negative emotion which lead to disinhibited eating.

Theoretical Perspectives on Overeating

Before summarizing the research literature related to overeating, it is necessary to spend some time deciphering the terminology frequently used in this area of research. For the purposes of this review, I considered overeating to be consuming more calories than the body expends. There are two types of overeating that dieters may engage in: "disinhibited eating" and "binge eating." "Disinhibited eating" is a term that is widely used by researchers to refer to eating that occurs among dieters or food restrictors when they break away from the rigid confines of their "diet" and eat what they think is forbidden or an amount they perceive as forbidden (Herman & Polivy, 1980). Dieters regularly inhibit their eating, which means that they restrict their caloric intake and/or types of foods they eat by ignoring physical cues and psychological impulses to eat.

When eating is disinhibited, dieters allow themselves to eat freely in response to their internal impulses for a short period of time. Unfortunately, when this occurs the impulse is usually for foods that have been restricted or withheld and usually involves consuming a larger quantity of the forbidden food than they normally would allow themselves to have (Herman & Polivy, 1980).

Many researchers use the terms “binge eating,” “overeating,” and “disinhibited eating” interchangeably, which can be very confusing to those not familiar with this line of research. In the present study, “binge eating” is reserved for a pattern of eating that is defined in the Diagnostic and Statistical Manual fourth edition (DSM-IV; American Psychiatric Association, 2000) as consuming unnaturally large amounts of food in a short period of time (usually ≤ 2 hours) while feeling an overwhelming loss of control. Binge eating can be a part of any of the following psychiatric diagnoses: anorexia nervosa, bulimia nervosa, and binge eating disorder. Binge eating involves disinhibition of eating; however, disinhibited eating is not always part of a “binge” as defined by the DSM-IV. In this review, I will discuss binge eating only when relevant to the disinhibited eating literature. In the current research study, I examine disinhibited eating in particular.

In this review and study, I will focus on the reasons for moving from inhibited or restricted eating to disinhibited eating. The terms “dieters,” “food restrictors,” or “food restrainers,” all refer to individuals, who chronically inhibit their food intake in one way or another whether it is total caloric intake, entire food groups, or a specific type of macronutrient such as fat or carbohydrate with the common goal of weight regulation (Herman & Polivy, 1980). “Chronic dieter” will be the term used to describe the subpopulation of dieters who are prone to disinhibited eating, as not all dieters are.

Although they are in the minority, some dieters successfully restrict their food intake and maintain a desirable body weight, but chronic dieters struggle with a vulnerability to disinhibit eating in certain situations such as following negative mood development, alcohol consumption, or a dietary preload (Herman & Polivy, 1980).

I will now turn to an in depth examination of the theories of overeating. Then expressive writing and its theoretical foundation as it relates to the proposed study and disinhibited eating will be discussed later. I will begin by reviewing theoretical perspectives explaining the causes of disinhibited eating among dieters.

Externality Theory

One of the earliest theories developed to explain why people overeat was Schachter's (1968) Externality Theory, which suggests that obese people lack sensitivity to physiological hunger cues but are highly responsive to external or environmental cues to eat. Schachter (1968) reviewed a number of studies in his original theoretical article that suggested obese individuals altered their eating patterns in response to external cues, such as time, taste, sight, and smell of food, while normal weight individuals changed their eating patterns in response to intrinsic feelings of fullness and fear (they ate less when afraid of an electrical shock). To summarize his conclusions, obese individuals ate because food was perceived as tasting good, smelling good, visually appealing, or because it was the traditional meal time (e.g., 5-6pm) regardless of the level of physiological hunger they were experiencing. Normal weight individuals started and stopped eating in response to physiological needs. When normal weight individuals felt

hungry they ate and when they were not hungry they did not eat. When normal weight individuals were afraid, they did not eat whether they were hungry or not.

Although, Schachter's (1968) theory is outdated, it did serve as a foundation for many of the later theories of overeating. One way in which Schachter's (1968) findings may be dated is that obese subjects in his studies may have been fundamentally different than obese individuals in our society today. In the late 1960's and early 1970's, individuals who were obese were in the minority leaving open the possibility that obesity may have been related to physiological abnormality or psychopathology. Today, obesity and overweight are more prevalent than normal weight, so the conclusions that Schachter drew in 1968 may not generalize adequately to modern obese and overweight individuals. Schachter (1968) predicted, based on his theory, that individuals on very low calorie diets, who remove food cues from their homes and environments should be very successful in losing weight. More recent research and obesity trends indicate that this approach is not likely to be successful for individuals today. If anything, research literature indicates that while very low calorie diets lead to short term weight loss, they also promote weight cycling (i.e., cycles of repeated weight loss and weight gain) with overall weight gain in the long term (Herman & Polivy, 1980; Popkess-Vawter, et al., 1998). Some of Schachter's (1968) major theoretical assumptions have been disproved by recent research, and part of the reason for this may have been that Schachter's (1968) theory was based on studies with questionable methods by modern standards. Schachter's (1968) methods will be critiqued next.

In retrospect it is possible to see methodological flaws which existed in some of the studies on which Schachter (1968) based his theory. One possible limitation in

Schachter's (1968) theory is that much of the research he cited in his review involved studies that utilized very small sample sizes with sample sizes ranging from 1 to 11 in some cases. Also, many of the studies relied on assumptions that may or may not have been accurate. For example, in one study, Schachter (1968) and his colleagues assumed that in general, college students found dormitory cafeteria food repulsive; however, no survey or baseline data was gathered to determine this. They concluded that more obese students ate off campus (86.5%) than normal weight students (67.1%) because obese students were more sensitive to the external cues of taste, sight, and smell in their food consumption behaviors than normal weight students, who ate in response to the physiological cues more than for taste or pleasure. Schachter's (1968) theory certainly had its limitations; however, Schachter did contribute to the understanding of overeating and obesity in exploring the differences in external versus internal cues for eating among normal weight individuals and obese individuals.

Psychosomatic Hypothesis

In contrast to Schachter (1968), McKenna (1972) believed that obese individuals overeat in response to emotional cues that are misperceived as hunger. He thought eating served as a way to eliminate the aversive experience of anxiety. McKenna's (1972) research supported his hypothesis and revealed evidence that was incongruent with Schachter's (1968) theory. He found, for example, that when presented with unappealing (taste and appearance) cookies, obese individuals ate more than normal weight individuals. The finding that obese individuals eat unappealing cookies contradicted

Schachter's (1968) externality theory, which predicted they would eat less than normal weight individuals because obese individuals were thought to be driven by taste and appearance rather than hunger. McKenna (1972) found obese individuals who were made to feel anxious consumed more unappealing cookies, while normal weight individuals who were made to feel anxious decreased consumption of unappetizing cookies. Obese individuals consuming cookies despite their appearance and flavor lent support to McKenna's (1972) psychosomatic theory. Emotion played a significant part in food consumption for obese subjects in McKenna's (1972) studies and he suggested this occurred as a result of misreading internal feelings of anxiety as hunger. The major contribution, McKenna (1972) provided to the field, was the suggestion that overeating and negative affect were related. While later researchers supported the suggestion of a relationship between overeating and negative emotions (Andrews & Jones, 1990; Baucom & Aiken, 1981; Lowe & Fisher, 1982), McKenna's (1972) psychosomatic theory had other limitations.

Just as Schachter's (1968) Externality Theory provided a foundation for later theories, so too did McKenna's psychosomatic theory (1972). However, it too became outdated as later researchers provided evidence that overeating may be linked with emotion only for chronic dieters rather than for all obese individuals (Ruderman, 1986). McKenna's (1972) research was limited in that the participants were all males and histories of dieting and weight fluctuations were not accounted for. Costanzo, Reichman, Friedman, and Musante (2001) found that food restriction behaviors mediated the relationship between negative mood and overeating. Interest in the Psychosomatic theory

waned as newer theories were developed that were able to tie together the relationship between overeating, external cues, and dieting status.

Restraint Theory

Herman and Polivy's (1980) Restraint Theory suggests that when individuals restrict their food intake, they unknowingly create a personal vulnerability to overeat later in various situations. Herman and Polivy (1980) account for this vulnerability by proposing that when food is restricted, physiological changes occur leading to a strong drive to increase caloric intake. Continued food restriction requires extreme effort and determination to override physiological caloric needs and impulses. The resolve to restrict food intake may be disturbed by some factors such as negative emotions (Ruderman, 1985a), perceived overeating or risk to overeating (preloading) (Herman & Mack, 1975; Ruderman, Belzer, & Halperin, 1985; Ruderman & Christensen, 1983), and alcohol consumption (Ruderman, 1986).

Early on the Restraint Theory was focused on disinhibited eating following a forced preload. A preload is sometimes used in overeating research and refers to a small serving of food consumed before a later serving of a larger amount of food (could be conceptualized like an appetizer before a meal). The preload is usually a high fat, high calorie food item that dieters would probably find incongruent with their weight loss goals. When a preload is used in overeating research, the researchers persuade participants to eat or drink a high fat and calorie beverage (e.g., milkshake) or food item by telling them it is for the purpose of evaluating some characteristic about the particular

food used as the preload (i.e., taste testing). Participants are then given another serving of food for a reportedly different reason (i.e., piloting a second snack option). What researchers find is that chronic dieters given a preload are much more likely to eat greater amounts of the second serving of food than non-dieters and chronic dieters who were not given a preload initially (Herman & Mack, 1975; Ruderman et al., 1985; Ruderman & Christensen, 1983). Irrational dichotomous thoughts such as, “I have already blown my diet, so I may as well give it up for today,” may mediate the relationship between the preload and disinhibited eating (Ruderman, 1985b).

Less research has focused on the relationship between disinhibited eating and alcohol consumption than on the effects of mood and preloads. Early researchers suggested that alcohol may be related to disinhibited eating (Ruderman, 1986), but recent research has failed to find a relationship between alcohol consumption and dietary disinhibition (Ouwens et al., 2003). It is somewhat controversial as to whether alcohol intake leads to disinhibited eating. It would seem that there is face validity to the concept of alcohol consumption leading to disinhibited eating as alcohol tends to lower inhibitions; however, since the focus of this study will be in the area of emotion and its impact on disinhibited eating, no further discussion regarding alcohol and disinhibited eating will occur. A more in depth review of the restraint theory, as it relates to emotion and disinhibited eating, follows.

Ruderman (1985a) was one of the first to demonstrate a relationship between disinhibited eating and negative mood. She asked 104 female college students to participate in a task that they were predetermined to fail or pass and to complete a mood measure before and after they completed the task. Although participants were pre-

determined by the researcher to pass or fail, the participants were told that the task was very easy and most reasonably intelligent adults would likely have no trouble with it. Researchers categorized the participants as chronic dieters or non-dieters depending on their scores on the Revised Restraint Scale (Herman & Polivy, 1980). Participants who were made to fail the task had a significantly lower mood state from pre-task to post-task completion than those who were not made to fail the task. Failing the task (which led to feeling badly) led to high cracker consumption for chronic dieters, while failing the task and feeling badly led to low cracker consumption for non-dieters. Interestingly, grams of cracker consumption did not differ between chronic dieters and non-dieters who did not fail the task, and therefore did not feel dysphoric (Ruderman, 1985a). These results suggest that for non-dieters, food consumption decreases when they experience a negative mood, whereas for chronic dieters, food consumption increases when they experience a negative mood.

Later research confirmed Ruderman's (1985a) findings of a relationship between negative mood and disinhibited eating among chronic dieters. Herman, Polivy, Lank, and Heatherton (1987) found that hungry (as determined by self report on a 7-point likert scale) dieters ate more when they felt anxious, whereas hungry non-dieters ate less when they felt anxious. Schotte et al. (1990) had participants watch a scary movie to induce fear, and provided each participant with a tub of fresh buttered popcorn to evaluate disinhibited eating. They told participants that the popcorn was provided to enhance the movie theater experience. The researchers found that chronic dieters who felt fearful while watching the movie had consumed significantly more buttered popcorn than non-dieters. Rotenberg and Flood (1999) found that chronic dieters who reported high levels

of loneliness following a loneliness mood induction (ruminating on a time they felt alone) ate more cookies during what participants thought was a “taste test” than the control group chronic dieters (no loneliness mood induction) and non-dieters. In each of these studies, researchers found evidence of a relationship between disinhibited eating and negative mood.

Originally, researchers thought that all negative mood states would lead to disinhibited eating among chronic dieters, but in the late 1980’s, Polivy, Heatherton, and Herman (1988), demonstrated that self-esteem may moderate the relationship between negative moods and disinhibited eating. In their review, Heatherton et al. (1991) suggested that only when a negative mood state is accompanied by low state self-esteem would disinhibited eating occur among chronic dieters. Events that have a simultaneous deleterious effect on mood and state self-esteem became known as ego threatening events. Herman and Polivy (1980) did not have an explanation for this phenomenon.

In summary, restraint theory is a well-documented theory of overeating and has a large amount of research to support it. Herman and Polivy’s (1980) major contribution to overeating and obesity research was in introducing the idea that food restriction may predispose individuals to overeat in certain situations and also in defining what some of those situations are. The restraint theory is still a heavily researched theory and has little research refuting its hypotheses, but it certainly has limitations. For example, Herman and Polivy (1980) do not adequately explain the mechanisms through which negative mood or lowered self-esteem leads to disinhibited eating for chronic dieters.

Ironic Processes

Boon, Stroebe, Schut, and Ijntema (2002) adapted an Ironic Processes model for eating behavior from Wegner's (1994) general Ironic Processes Theory. Boon et al. (2002) proposed that when individuals exert mental control over a behavior such as restricting food intake, two types of cognitive processes occur: operating processes and monitoring processes. Operating processes screen the cognitive field for messages consistent with goals for a particular desired state (i.e., weight loss). Operating processes involve conscious attention to goals and desires along with thoughts about behaviors necessary to achieve their goals and desires. With chronic dieters, operating processes probably include thoughts about what one should and should not eat, how much, and when to eat. Conversely, monitoring processes serve to monitor the cognitive field for any indication of "failure of mental control" (Boon et al., 2002, pp. 3) or messages that are inconsistent with goals and desired states. The monitoring process, as opposed to the operating process, is unconscious and requires little effort to maintain. For chronic dieters, monitoring processes screen the cognitive field for desires and urges to eat foods that are inconsistent with desired goals. Desires to eat forbidden foods are a risk to mental control over inhibition of eating behavior, and when detected by monitoring processes, operating processes are triggered to maintain mental control over urges and desires (Boon et al., 2002).

Under a state of high cognitive load, effortful and conscious operating processes become monopolized by more salient needs such as regulating emotion or performing complex mental tasks. Averted attention of operating processes leads to reduced focus on maintaining inhibition over food intake and attention to consistent cognitive messages for

desired goals. Boon et al. (2002) proposed that during states of increased mental load, monitoring processes continue to unconsciously search the cognitive field for desires to eat while operating processes remain focused on other tasks besides maintaining dietary inhibition. Without operating process attention to maintain inhibition, thoughts and desires to overeat become more prominent and are not counterbalanced by operating processes' attention to goals and desires. In this situation, maintaining control over urges to overeat is difficult and often leads to disinhibited eating. Cues that chronic dieters are trying to avoid (e.g., desires to eat) lead them to overeat (Boon, Vogelzang, and Jansen, 2000).

Boone et al. (2002) may have provided a viable explanation for disinhibited eating. Boon et al. (2002) have found some support for this theory by demonstrating that chronic dieters experienced disinhibited eating when distracted with a listening task while those who were not distracted maintained greater restraint in their eating behaviors. Also in support of the ironic processes model, Boon et al. (2000) showed that during a visual word recognition task, chronic dieters recognized food related words in less time than participants who were non-dieters, indicating the presence of monitoring processes on alert for food cues inconsistent with desired goals. While this theory has some supporting evidence, there are many unanswered questions, mainly regarding the exact mechanisms that lead an individual to engage in the behavior they are trying to refrain from. It is unclear why intense monitoring of one's thought processes for desires to overeat leads to disinhibited eating during a state of high cognitive load.

Escape Theory

Heatherton and Baumeister (1991) proposed a theory for disinhibited eating called the escape theory, which proposes that individuals eat in an effort to escape from aversive self-awareness. Heatherton and Baumeister (1991) suggest there are different levels of thinking. High level thinking focuses on immediate events and stimuli and their link with long term events in the past and future. For a dieter, connections with long term events in the future may include awareness of consequences for overeating (Heatherton & Baumeister, 1991). High level thinking is characterized as contextual, critical, analytical, and rational. Low level thinking concerns only immediate stimuli, sensations, and impulses. One example provided by Heatherton and Baumeister (1991) to describe low level thinking is focusing on the muscle movement used to hold a pencil and make marks on a paper. High level thinking integrates the direct and immediate stimulus of the feeling of the muscle movement and weight of the pencil in the hand with other thoughts such as evaluation of the content of the writing and recognition of the environmental context to be able to see this activity is cheating on an exam. While high level thinking is contextual, analytical, and logical, low level thinking is narrow, closed, and immediate. Another key element to differentiate high and low level thinking is in the degree of self-focus. According to Heatherton and Baumeister (1991), high levels of thought involve high self-awareness and make personal meaning out of past, present, and future thoughts, events, feelings, etc. Low levels of thinking involve little awareness of self and draw few conclusions about the personal meaning of sensory stimuli (Heatherton & Baumeister, 1991).

According to Heatherton and Baumeister (1991) the escape process begins when the chronic dieter compares him or herself with some ideal societal standard. When they do not see themselves as comparable to this standard, they feel negative affect and lowered sense of self-esteem. Negative affect and lowered self-esteem occur as a result of high level thoughts connecting the immediate event or stimulus to past events, feelings, and thoughts and drawing conclusions from it. If this complex connection were not being made then the individual would not experience the negative mood or lowered state self-esteem. It is only through the connection to high level cues that negative affect can occur. To avoid feeling the negative emotion, the individual may shift from high levels of thought to low levels of thought. The low level thinking state is termed the “deconstructed state” and is characterized by “...narrowed attention focusing on the immediate present, concrete, or low-level thinking, and a refusal of broadly meaningful thought...” (Heatherton & Baumeister, 1991, p. 89). While the transition to low level thinking may serve to alleviate the negative mood experience it also serves to allow stimuli, sensations, and impulses to guide behavior. For a chronic dieter, impulses to eat tend to surface during the deconstructed state. Without high level thinking to allow awareness of future goals and consequences of eating to inhibit impulses, the individual becomes vulnerable to impulses to eat. It has also been hypothesized (Heatherton & Baumeister, 1991) that eating then provides salient sensory stimulation, on which the individual can focus their low level thoughts and attention. In other words, it gives the disinhibited eater an external focus for their attention, thus assisting the escape from negative emotion.

Escape theory is a comprehensive theory of overeating with detailed explanation of disinhibited eating. It has a solid foundation of research to support it and it is for these reasons that I have chosen this theoretical foundation for the present study. I will now summarize the empirical evidence that pertains to the Escape Theory.

Ego Threats

As mentioned previously, an ego threatening event is any event that leaves individuals feeling badly about themselves. Ego threatening events are often times operationally defined in research as a combination of low scores on measures of state self-esteem and high scores on measures of negative mood. Some research has provided evidence of a relationship between ego threatening events and overeating (Polivy et al., 1988). Polivy et al. (1988) found that female chronic dieters who scored high on a self-esteem measure experienced less disinhibition for eating ice cream than female chronic dieters who scored low on state self-esteem. The authors suggested that low state self-esteem levels may moderate the relationship between negative moods and disinhibited eating among chronic dieters.

Heatherton et al. (1991) attempted to test Polivy et al.'s (1988) theory about low state self-esteem moderating the relationship between negative mood and overeating. To study this, they used four different conditions to elicit a negative mood state. The threat of shock was used to induce fear, which was not expected to also affect self-esteem levels. A failure task was used to represent an ego threat because it was expected to induce negative mood and decrease state self-esteem. The third condition involved the

threat of an ego threatening event. Heatherton et al. (1991) told participants in this condition that they would be making a speech to a room full of people within the next several minutes. This condition was expected to induce anxiety and fear about embarrassing themselves in front of an audience. The fourth condition served as the control group. In this group participants were not exposed to any mood or self-esteem altering event. They simply completed mood measures. Following each condition, participants were asked to taste test ice cream for the purposes of evaluating flavor and quality. In actuality, the researchers sought to determine how much each participant consumed. Results showed chronic dieters ate more when they experienced the failure task condition (ego threatening event) or the speech threat condition (anticipation of an ego threatening event) than when they experienced a shock threat (negative mood without effect on self-esteem) or no event (control). These results indicate that an ego threatening event or even just the anticipation of an ego threatening event may lead to disinhibited eating, whereas anxiety in the absence of lowered state self-esteem may not lead to disinhibited eating.

Other researchers have supported Heatherton et al.'s (1991) findings. McFarlane, Polivy, and Herman (1998) found that chronic dieters disinhibited their eating following a false weight feedback intervention that served as the ego threatening event. Half of the participants were weighed accurately and the other half were told they weighed five pounds more than they really did. For chronic dieters, false weight feedback resulted in decreased self-esteem and heightened anxiety while the non-dieters were unaffected. After being given both types of weight feedback, participants were presented with plates of cookies and asked to evaluate their quality. Participants were given 10 minutes alone

with the cookies to rate various aspects of their flavor. The cookies were weighed before and after taste testing to determine how much the participants had eaten. Results showed non-dieters did not eat more or less as a result of the weighing condition, but chronic dieters ate significantly more cookies than the non-dieters when they were provided false weight feedback.

Kahan et al. (2003) also found results suggesting that ego threatening events for chronic dieters lead to disinhibited eating. In this study, participants were asked to solve a puzzle. Half of the participants were asked to solve the puzzle while sitting alone at a computer. The other half of the participants were asked to solve the puzzle publicly in a group with other participants. What the participants in the group did not know was that some of their fellow participants were actually confederates who provided incorrect answers to easy questions for the purpose of placing peer pressure on the actual participants to answer questions in a way that they probably knew was incorrect. The struggle to conform or to use their better judgment and answer the question in the way they thought was correct served as an ego threat because it induced anxiety and lowered state self-esteem. Participants who were left in isolation to perform the task did not report negative mood or lowered state self-esteem. Results revealed that the chronic dieters ate more cookies following the ego threatening event than chronic dieters who solved the puzzles in isolation (non-ego threatening event). Non-dieters did not eat significantly more or less depending on ego threatening event. The results of this study lend support to the idea that ego threatening events lead to disinhibited eating among chronic dieters, but not for non-dieters.

Heatherton et al. (1998), in a comprehensive series of experiments, provided more evidence for the idea that ego threatening events lead to disinhibited eating among chronic dieters. In the first study, they showed ego threatening events in the forms of a failure task and sad music led to significantly more disinhibited eating than did neutral music. These results were surprising in that while sad music led to negative mood as expected it also led to lower state self-esteem. State self-esteem scores indicated that those that listened to the sad music felt worse about themselves after listening to the music than those who listened to neutral music. The combined effect of negative mood and lowered state self-esteem made this an ego threatening intervention.

In the second study, Heatherton et al. (1998) found that non-dieters ate significantly less than chronic dieters when exposed to sad music (ego threat). This suggests that non-dieters have a tendency to eat less than they would have had they not been exposed to an ego threatening event, while chronic dieters eat more than they would had they not been exposed to an ego threatening event.

In the third study stories tailored for each individual participant served as the ego threatening event (Heatherton et al., 1998). Researchers told a very poignant story about a car accident and in the ego threat condition, the protagonist was the participant. In the negative mood only condition, the protagonist was a fictional character named “Jon.” In a neutral control condition, participants heard a story about the participant driving to the library to pick up friends. As expected, disinhibited eating occurred when participants heard the sad story about themselves, but not when they heard the neutral story or the sad story about “Jon.” These results also support the notion that disinhibited eating for chronic dieters occurs following ego threatening events. Ego threatening events can vary,

but the commonality among them is that they lead to lowered self-esteem and negative mood.

Over the years, a significant number of researchers have found evidence to support the idea that chronic dieters overeat in response to ego threatening events (Heatherton et al., 1991; Heatherton et al., 1998; Kahan et al., 2003; McFarlane et al., 1998; Polivy et al., 1988). Most recently, Baumeister et al. (2005) concluded that ego threatening events in the form of social exclusion and peer rejection result in disinhibited eating among chronic dieters.

Although there is strong empirical support tying disinhibited eating to ego threatening events, there are some researchers who believe all negative emotions, regardless of whether they are linked with lowered state self-esteem, lead to differences in eating patterns between chronic dieters and non-dieters (Schotte, 1992). Sheppard-Sawyer, McNally, and Fischer (2000) found that chronic dieters did not eat significantly more following a negative mood induction (independent of lowered state self-esteem) than chronic dieters in the control condition (Sheppard-Sawyer et al., 2000). However, when *non-dieter* participants were shown a sad movie clip, they ate significantly less popcorn than when they watched a neutral travelogue movie clip. In other words, chronic dieters did not eat significantly more or less popcorn when feeling sad than when their mood was neutral. Negative emotion not resulting from an ego threatening event, may not influence how much a chronic dieter eats, but in non-dieters negative mood not resulting from an ego threatening event may lead to decreased eating. Others have found similar results among non-dieters (Heatherton et al., 1998). Schotte (1992) argued that

this divergent effect of non-ego threatening negative affect on chronic dieters' and non-dieters' eating is an issue that needs to be further researched.

In an attempt to further explore differences in chronic dieters and non-dieters eating responses to negative moods, Cools, Schotte, and McNally (1992) asked participants to watch one of three randomly assigned movies: a neutral affect movie, a positive affect movie (comedy), and a scary movie (horror). Chronic dieters in the positive affect and negative affect movie groups consumed more popcorn than chronic dieters in the neutral movie group. Participants who watched the horror film reported increased feelings of not only anxiety, but also depression and anger. Cools et al. (1992) suggested that emotional arousal may be what leads to disinhibited eating regardless of valence or type of emotion. Cools et al. (1992) used these findings as a basis for the argument that any type of strong emotional state would induce disinhibited eating among chronic dieters not only those emotions associated with an ego threatening event.

The publication of Cools et al. (1992) article sparked a debate among researchers investigating overeating. Positive mood and fear had not been considered as disinhibitors of restricted eating. Heatherton, Herman, and Polivy, (1992) continued to support their argument that disinhibited eating occurs following an ego threatening event only and said Cools et al.'s (1992) data actually strengthened their argument because participants who watched the horror film experienced anxiety and depression. Depression, according to Heatherton et al. (1992) is indicative of an ego threatening experience since it involves a certain degree of self-focus. Cools et al.'s (1992) findings of disinhibited eating following positive mood induction have not been addressed in the counter arguments or in later research.

Although some researchers disagree as to whether disinhibited eating occurs in response to negative emotions exclusively following an ego threatening event or whether it can occur in response to mood states resulting from non ego threatening events, few would disagree that chronic dieters' eating patterns differ from non-dieters' eating patterns and that ego threatening events have at least some relationship to this difference.

Escape as a Coping Strategy

Escape Theory holds that individuals escape mood states related to aversive self-awareness through eating. Some researchers have shown that, in general, individuals with pathological and non-pathological tendencies to overeat utilize coping strategies such as avoidance, escape, and distraction more than those who do not have a tendency to overeat (Ghaderi & Scott, 2000; Paxton & Diggins, 1997; Schwareze et al., 2003).

Before I review this research it is important to keep in mind a minor limitation in the interpretation of the following findings for non-pathological chronic dieters. Recall that binge eating and disinhibited eating are two different concepts with binge eating referring to a strict DSM-IV definition of overeating whereas disinhibited eating refers to breaking diet generated rules (i.e., cheating on a diet). Heatherton and Baumeister (1991) used the term "binge eating" to refer to disinhibited eating. They preface their theoretical article by saying they did not strictly refer to the DSM-IV definition of binge eating. Their broad definition included those who engage in "binge eating" as defined by the DSM-IV *and* also those who engage in "disinhibited eating" (chronic dieters). Many researchers have studied the Escape Theory by examining binge eating as defined by the

DSM-IV rather than “disinhibited eating” when testing components of this theory (Ghaderi & Scott, 2000; Paxton & Diggins, 1997; Schwareze et al., 2003). When researchers study the escape theory using true binge eaters by DSM-IV standards, the results may or may not generalize to disinhibited eaters. In the current study, I will focus on the application of the escape theory with a sample of chronic dieters, who may be different from those who “binge eat.” However, to be as comprehensive as possible I will discuss in this review research on the escape theory using binge eaters as well as chronic dieters.

In an attempt to test escape theory by examining the relationship between avoidance coping and binge eating, Paxton and Diggins (1996) had 149 female college students complete a battery of questionnaires to measure restrained eater status, binge eating status, depression, and coping style. They found that avoidance coping styles were significantly related to binge eating practices, but when the effects of depression were controlled, this relationship disappeared. Heatherton and Baumeister (1991) specify that disinhibited eating occurs following the onset of a negative emotion resulting from an ego threatening event. Theoretically, without negative emotion or the ego threatening event, disinhibited eating should not occur. Thus it is expected that depression levels mediate the relationship between escape avoidance coping style and binge eating. If one has an escape avoidance coping style and they are not depressed then they have no aversive experience to escape.

Schwareze et al. (2003) found similar results when they conducted a study to investigate Heatherton and Baumeister’s (1991) escape theory as it applies to binge eating. Individuals who binge eat scored significantly higher on the avoidance coping

measure than individuals who do not non-binge eat, but when depression was controlled for, differences in coping style between these groups were not seen. They concluded that when individuals who binge eat feel depressed, they utilize escape avoidance coping strategies. When depression is not present, individuals who binge eat may not resort to escape through binge eating.

Ghaderi and Scott (2000) did not find support for the mediating effect of depression that Schwartze et al. (2003) found. When a group of individuals who binge eat with Bulimia Nervosa or Binge Eating Disorder were compared to a control group on coping strategies, a significant difference was seen between groups on escape avoidance coping. The binge eating group reported using more escape avoidance coping strategies than the control group. When depression was controlled for, a significantly higher amount of avoidant coping strategies were still seen among the binge eating group than the control group.

Freeman and Gil (2004), in a study designed to examine coping strategies in an effort to test the escape theory, found that females who binge eat who reported using distraction as a coping strategy also reported more binge episodes in stressful situations than those who did not use distraction as a coping strategy. Also, those who used acceptance as a coping strategy reported fewer binges per day as stress increased compared to those who did not use acceptance as a coping strategy. These findings suggest that there is a relationship between avoidance coping and increased disinhibited eating in the form of binge eating. Also emotional acceptance may help to decrease disinhibited eating in the form of binge eating despite increasing stress levels.

In general there seems to be a relationship between avoidance coping and binge eating. Researchers have shown that individuals who struggle with binge eating have a tendency to overeat in an effort to avoid or escape emotional states such as anxiety, stress, and depression. It is important to reiterate the fact that while these findings support the escape theory for an eating disordered population, they lend limited support for the escape theory as it applies to a non-eating disordered population of chronic dieters.

Mood Following Disinhibited Eating

Some researchers have hypothesized that chronic dieters avoiding aversive self-awareness and negative moods associated with it, might be expected to experience an improvement in mood after disinhibited eating (Greeno, Wing, & Shiffman, 2000; Katzman, 1989; Lingswiler, Crowther, & Stephens, 1985; Sherwood, Crowther, Wills, & Ben-Porath, 2000). However, in general, researchers have not been able to support the notion that mood during or immediately following disinhibited eating improves. If anything mood following disinhibited eating seems to become increasingly dysphoric (Greeno et al., 2000; Katzman, 1989; Lingswiler et al., 1985; Sherwood et al., 2000). This is not a cause for dismissing the escape theory though. The lack of support for finding improved mood during disinhibited eating probably speaks more to inaccurate assumptions and limitations in the research methods than the theory.

To assume that escaping negative mood leads to improvement in mood may be misleading. It may be possible that escaping negative moods leads to escaping all mood states with the result being numbness rather than improved mood state. Also it is

extremely difficult to measure mood during disinhibited eating. Researchers have attempted to measure mood during, before, and after disinhibited eating by asking participants to complete mood measures and food diaries throughout the day for several days or weeks in a natural setting (Greeno et al., 2000; Katzman, 1989; Lingswiler et al., 1985; Sherwood et al., 2000). The problem with this type of method is that those who routinely restrict their food intake (dieters) seem to suppress their food intake when around other people or when participants believe their eating is being monitored (Herman, Roth, & Polivy, 2003). This can cause any information gathered during eating experiences to be invalid or at least to be ineffective for explaining the experience during disinhibited eating. Also, if eating serves as an escape from self-awareness emotions, then asking chronic dieters about their affective experience while eating may actually be therapeutic in the sense that it asks subjects to increase self-awareness rather than allowing them to escape from self-awareness. As demonstrated in Heatherton et al. (1993), increased self-awareness tends to lead to decreased food consumption among chronic dieters.

Self-Awareness and Disinhibited Eating

Heatherton et al. (1993) contend that, "...aversive self-awareness maintains inhibitions, whereas escape from that self-focused state leads to disinhibition" (p. 58). When individuals escape self-awareness and the related negative emotion, they simultaneously shift to a lower level of thought. Remember also that the escape theory holds that the behaviors associated with a deconstructed state (lower level thinking) are

driven by simplistic impulses. Higher level thinking maintains self-regulation over impulses. Little research has been done using samples of chronic dieters to assess the influence self-awareness has on the impulse to eat. However, researchers in the general self-regulation area have demonstrated that an ego threatening event leads to difficulty in mental control over impulses and regulating behaviors such as eating, forced consumption of unpleasant food, persistence in a difficult task, and vigilance in directing attention (Baumeister et al., 2005; Dixon & Baumeister, 1991).

Heatherton et al. (1993) examined how increasing self-awareness through self-focus influenced chronic dieters' eating behaviors following an ego threatening event. Participants were first subjected to a neutral event (successful completion of task) or an ego threatening event (a failure task that had the desired effect of decreasing mood and state self-esteem as compared to those who participated in the neutral task). Participants in the ego threatening group were then divided into three more groups: a group who sat in isolation for 10 minutes after the failure task, a group who watched a nature documentary for 10 minutes after the failure task, and a group who talked about their thoughts, feelings, and strategies used to complete the task while watching themselves on video participating in the failure task they had just completed. This last condition was designed to enhance self-focus and inhibit escape from self-awareness. The isolation group was designed to allow the participants to freely escape from self-awareness and watching the nature documentary was designed to facilitate escape from self-awareness. All groups including the control group who only participated in the non-ego threatening task at the beginning were then presented bowls of ice cream for what they thought was a taste testing task.. In actuality, the researchers were interested in determining how much ice

cream the participants would consume after experiencing the various conditions. They found that chronic dieters in the non-ego threatening task group and those who watched the failure task video of themselves ate significantly less ice cream than chronic dieters who were encouraged to escape self-awareness (nature documentary) and participants who were allowed to escape self-awareness (sat in isolation). Heatherton et al. (1993) suggest increasing self-focus and self-awareness following an ego threatening event may help chronic dieters maintain as much inhibitory control over their eating as those chronic dieters who had not experienced an ego threatening event. These results suggests that among those chronic dieters who have experienced an ego threatening event, those who increase self-focus and self-awareness may be more likely to maintain inhibition over eating than those who escape self-awareness.

Baumeister et al. (2005) conducted a series of six experiments and concluded ego threats in the form of social rejection make self-regulation more difficult than self-regulation when no ego threatening event occurred. Self-regulation refers to forcing oneself to behave in a particular way that is not consistent with impulses and drives. Baumeister et al. (2005) predicted that social rejection and anticipated social rejection would serve as ego threatening events that would make self-regulation difficult. Self-regulation took many forms in these six experiments including regulation of eating behavior. In the second study, participants engaged in an exercise where they were introduced to several other research participants and then asked to choose the two people in the room they would most like to work with. Researchers randomly assigned half of the participants to a social rejection group. Participants in the rejection group were told that no one opted to work with them. The other half of the participants were told that

everyone wanted to work with them. Next, participants were given mood measures to complete and asked to participate in a “taste testing” task. They were left alone with a rating sheet and a plate of cookies to eat. Results showed that those who thought they were rejected by the group members ate more cookies than the group that believed everyone wanted to work with them. Interestingly, participants in this study were not necessarily chronic dieters. They came from a general college student population. The authors noted, however, that pilot data suggested that most university students found eating cookies to be enjoyable but also an unhealthy, undesirable behavior. Thus the researchers concluded that for most students, refraining from eating the cookies requires self-regulation.

In the Baumeister et al. (2005) series of experiments, one other experiment is of relevance to this review. In the first four experiments, the researchers provided converging evidence that suggested social exclusion related to diminished ability to self-regulate in a variety of ways (eating, forced consumption of unpleasant food, persistence in a difficult task, and directing attention). In the last study, the researchers sought to determine whether self-awareness would counter the effects ego threatening events such as social exclusion had on self-regulatory ability. Participants were randomly assigned to one of three groups. The first group was told that based on responses to a measure they completed upon arriving, the researchers could predict that they most likely would have a lonely future. The second group was told that their responses indicated they would probably have a life filled with satisfying relationships. The last group was told that according to their responses, it appeared they were accident prone and probably would have a future of injuries and illnesses. Next, participants took part in a listening task to

measure self-regulation. For the listening task, participants wore headphones that played a female voice reciting a news report in one ear and a male voice reciting a list of words in the other ear. The participant had to self-regulate their attention to focus on the male voice reciting the words and write those words down on a piece of paper as the voice said them. Half of the participants were seated in front of a mirror during this listening task to enhance self-awareness. Results showed that the participants who were told it was likely that they would end up alone in life, performed better on the listening self-regulation task when they were seated in front of the mirror than the participants given the same information but not seated in front of the mirror. These results indicated that self-awareness assisted in countering the effects of the ego threatening event (fear of social exclusion) on self-regulatory ability (Baumeister et al., 2005).

A major tenet of escape theory is that overeating occurs as a result of the drive to escape aversive self-awareness following an ego threatening event. Heatherton and Baumeister (1991) suggested that increasing self-awareness may counter the effects of the ego threatening event on disinhibited eating. These studies provide evidence to suggest that self-awareness may assist chronic dieters in maintaining inhibition over impulses to overeat in the face of ego threatening events. Manipulating the level of self-focus may have future implications in the treatment of disinhibited eating.

High and Low Levels of Thought

The last major concept in escape theory is the idea that individuals revert to lower levels of thought in their effort to escape aversive self-awareness and negative emotion.

In one of the only studies to assess this hypothesis, Beebe, Holmbeck, Albright, Noga, and DeCastro (1995) claimed they failed to find support for this theory. However, the non-significant results in this study may have been the result of the research design and hypotheses rather than problems with the theory (Beebe et al., 1995). Beebe et al. (1995) asked 126 college women to complete several measures of perfectionism, self-consciousness, negative affect, and level of thought tendency (high versus low). After participants completed these measures they were randomly assigned to a high cognitive level group or a low cognitive level group. In the high cognitive level group, they were asked to think about an interaction they had with another woman recently and list qualities about themselves they felt were demonstrated in that interaction. In the low cognitive level group, participants were asked to think of the same type of situation, but list things they did in the interaction rather than qualities about themselves (encourages low self-awareness and little amount of critical thinking). Next, all subjects were asked to participate in what they thought was a taste test to evaluate several flavors of ice cream. In reality, researchers wanted to determine if the amount of ice cream consumed would differ between the two different cognitive level groups. Participants were left alone with the ice cream and flavor rating forms. Through factor analysis of results on the measures the participants completed, a group was extracted and labeled as prone to overeating because they exhibited more depression, lower self-esteem, pathological eating patterns, and higher self-consciousness than the rest of the participants (Beebe et al., 1995). Results seemed inconsistent with escape theory because the women prone to overeating actually ate more when asked to utilize higher cognitive level thinking than women who

were not prone to overeating. Beebe et al. (1995) concluded that these results contradicted the escape theory.

This conclusion based on the results of this study may not be warranted, however, because Beebe et al.'s (1995) hypothesis and methods were not consistent with the escape theory to begin with. The idea behind Heatherton and Baumeister's (1991) suggestion that disinhibited eating occurs as a result of a desire to escape self-awareness is contingent upon the fact that chronic dieters are escaping awareness of current negative ego threatening emotions through eating food. The immediacy of the aversive emotional experience is a key element to this theory's application. In Beebe et al.'s (1995) study participants were asked to increase self-awareness about an arbitrary situation that may or may not have aroused a negative mood state during the event itself or in the retelling of the situation. What would have been more telling would have been if Beebe et al. (1995) had asked participants to discuss thoughts and feelings in the moment at both low and high cognitive levels following an ego threatening event. More research is needed to explore the viability of the high and low level thought hypothesis. Part of the reason there has been little research in this area is because thought complexity is very difficult to measure.

Aside from the lack of research in the area of thought complexity, the literature seems to support escape theory overall. However, unanswered questions remain. While, the relationship between disinhibited eating, escape coping strategies, and ego threatening events seem well documented, the role of self-awareness and thought complexity need to be further explored in order to confirm or disconfirm this aspect of the theory. At this time, based on the research, escape theory seems to be the most viable theory of

disinhibited eating as compared with other theories of overeating that are not as comprehensive or empirically supported. As mentioned previously, Heatherton and Baumeister (1991) suggest that the point at which an individual reverts to lower level thinking, which is linked to disinhibited eating, is the point at which the individual seeks to avoid negative emotion related to self-awareness. If this is taken one step further and thought of in terms of treatment implications, it may be concluded that techniques designed to increase self-awareness may enable the chronic dieter to maintain connection to the higher levels of thought that control inhibitions.

Expressive Writing

Expressive writing involves writing about one's thoughts and feelings about a designated topic, usually a past trauma. Typically expressive writing is done for 20-minutes on three to four consecutive days (Pennebaker, 2004). Expressive writing involves emotional disclosure in that the writer discloses via writing their personal thoughts and feelings about a particular topic. The writers usually are aware that the writing samples will eventually be read, but the writer is often promised confidentiality to encourage open and honest writing. Pennebaker and Beall (1986) first established the health benefits of expressive writing when they demonstrated that a group of college students visited the campus health center less frequently after participating in a written emotional disclosure task as compared to a group of college students who wrote about a non-emotional topic for equal duration. Since then, expressive writing has continued to be examined in light of its effects on improving physical and psychological health. When

individuals are asked to write about a past trauma (Sloan & Marx, 2004), one's best possible self (King, 2001), or intensely positive topics (Burton & King, 2004) they usually experience psychological and physical health benefits as compared to individuals who write about a neutral topic. Population samples for whom expressive writing has been shown to be therapeutic have been trauma victims (e.g., Pennebaker, 2004; Stephens, 2002), college students (e.g., Ullrich and Lutgendorf, 2002), and medical patients (Smyth et al., 1999). Despite the large volume of research exploring expressive writing, there is little understanding about the reasons for expressive writing's beneficial effects (Esterling et al., 1999).

Researchers have not examined expressive writing's use in promoting self-awareness and higher level thoughts for the purposes of maintaining dietary inhibition among chronic dieters as I have in this study. Tice, Bratslavsky, and Baumeister (2001) sought to determine whether participants' belief that mood states would not change depending on food consumption would interfere with participants' desire to eat following a negative mood induction. What is interesting about this study was that the mood induction involved writing about their thoughts and feelings in the moment about a sad story the participants read. They were asked to write for 15 minutes to enhance the aversive mood inducing effects of the story before being introduced to the food consumption task. After writing for 15 minutes, half of the participants were told that eating would not alter mood state and the other half were told nothing. Participants in the mood "freezing" condition ate significantly less than those who were told nothing, but the chronic dieters and non-dieters did not differ in amount of food they consumed depending on the group they were assigned. The results support the idea that high self-

awareness writing may assist chronic dieters in eating in a comparable way to non-dieters, which we assume to be “normal.”

Also, Heatherton et al. (1993) used an oral disclosure intervention to increase self-awareness and prevent disinhibited eating among chronic dieters (Heatherton et al., 1993). In the current study I am proposing that written disclosure will lead to increased self-awareness and prevent disinhibited eating among chronic dieters just as Heatherton et al.'s (1993) oral disclosure did. While no other researchers have compared written and oral disclosure on levels of self-awareness or in preventing disinhibited eating, several studies have shown that both oral and written emotional disclosure produce equivalent physical and psychological benefits (e.g., Donnelly & Murray, 1991; Lumley, 2004; Murray et al., 1989). For example, Murray et al. (1989) showed that individuals who engaged in written disclosure about a past trauma did not significantly differ from those who engaged in verbal disclosure about a past trauma. Both groups saw improvements in cognition, self-esteem, and adaptive behavior as compared to the control group, who received neither treatment. Donnelly and Murray (1991) later confirmed these results by revealing that participants who participated in either written disclosure about a past traumatic event or verbal disclosure about a past traumatic event experienced equivalent reductions in negative emotions, increases in positive emotions, increases in self-esteem, and adaptive changes in behavior. Individuals seem to benefit from either written emotional disclosure or oral emotional disclosure (Esterling et al., 1999).

There seems to be no one agreed upon comprehensive theoretical explanation for the effectiveness of emotional expression in improving psychological and physical health (Pennebaker, 2004). Esterling et al. (1999) said, “Despite the beneficial effects of writing,

it is not entirely clear why it is effective in bringing about such striking physical health and behavioral change” (p. 84). While there may be several theories to explain expressive writing, many hypotheses fall under one of three theoretical models: Pennebaker’s emotional inhibition model, the cognitive adaptation model, or the exposure processing model (Sloan & Marx, 2004).

Pennebaker (1995) suggested that expressive writing’s physical health benefits come from disclosing inhibited emotions. He proposed that suppressing emotions requires effort and leads to increased physiological and psychological stress that can contribute to physical illness. Gross and Levenson (1993, 1997) confirmed that when subjects are asked to inhibit verbal and non-verbal behavioral expressions of emotion following a negative mood induction, they experience increased activation of the sympathetic nervous system as measured by physiological indices such as heart rate and blood pressure. Pennebaker (1995) hypothesizes that when individuals engage in emotionally expressive activities such as writing or talking, they experience a decrease in stress levels that lead to improved immune functioning and health status. This theory provides a strong argument for explaining expressive writing’s influence on physical health status. However, for this study’s sample of chronic dieters, physical health status is not being evaluated, so the two remaining theoretical models will be discussed in greater detail in the following section.

Those who have experienced a past trauma seem to receive a great deal of benefit from expressive writing (e.g., Bernstein, 2001; Francis & Pennebaker, 1992; Greenberg et al., 1996; Murray et al., 1989). Some expressive writing researchers believe that one of expressive writing’s benefits for this population may be that it functions as a type of

exposure therapy (Sloan & Marx, 2004). The premise behind the emotional exposure model is that neutral stimuli through the learning process become paired with stimuli that elicit a particular response such as fear. Eventually the neutral stimuli produce the same response (fear) as the stimuli that originally produced the fear. The conditioned fear response then leads individuals to avoid the neutral stimuli because it is paired with the fear response. Exposure therapy involves repeated exposure to the stimuli that was at one time neutral. Repeated exposure without the feared consequence eventually leads to extinguishing the paired association between the conditioned fear response and the neutral stimulus. It is hypothesized that, expressive writing may function as a way to expose individuals to a neutral stimulus (e.g., memories of past trauma) that has become paired with a conditioned response (e.g., fear). It is believed that, over time, writing about the past trauma, will extinguish the conditioned response of fear.

Researchers do not all agree with the exposure theoretical model of expressive writing. Kloss and Lisman (2002) failed to find a significant improvement in physical or mental health following repeated written disclosure sessions about a past trauma. Schoutrop, Lange, Hanewald, and Davidovich (2002) however, found that participants who had experienced a past trauma and who wrote about that trauma for 45-minutes on five separate occasions over a two week period reported fewer intrusions of thoughts and images related to that trauma as well as reductions in avoidance behavior related to the trauma. Researchers need to further explore the exposure theoretical model of expressive writing to determine whether it is a feasible theory to explain expressive writing's benefits.

Another theoretical model, which has been used to explain the benefits of expressive writing, is the cognitive adaptation theory (Sloan & Marx, 2004). Horowitz and Znoj (1999) suggest that when events are not congruent with one's existing schema, emotions arise to cue the individual to focus attention on the situation so that he or she may integrate core beliefs with the event. Readjusting schema, which is also referred to as information processing, requires the individual to remain aware of their current emotional mood state, which serves as a barometer for the individual's need for information processing. Horowitz and Znoj (1999) speculate that in some cases, individuals opt to avoid excessive emotional arousal and employ emotion regulation strategies to inhibit the emotional experience. Borkovec, Roemer, and Kinyon (1995) suggest that when emotions are suppressed rather than processed, the individual will experience a tendency for negative mood, intrusive images, and maladaptive behavior. Expressive writing may be a way for perceptions of events to be integrated with core beliefs, thereby alleviating distressing mood, and maladaptive thoughts and behaviors.

In light of the cognitive adaptation theoretical model of expressive writing, chronic dieters who have experienced an ego threatening event may benefit from expressive writing because it may provide them with the opportunity to integrate their thoughts and feelings about the ego threatening event with existing schemas. Heatherton and Baumeister (1991) have hypothesized that increasing self-awareness and higher levels of thinking may assist the chronic dieter in maintaining dietary inhibition by maintaining cognitive connections to future goals and desires for weight loss. It is possible, that expressive writing may assist chronic dieters in processing ego threatening

events so that they do not lead to later interference in mood and maladaptive thoughts and behaviors such as disinhibited eating.

Within the cognitive adaptation model, information processing involves assimilating existing core beliefs with events that are incongruent with core beliefs.

Research on the cognitive adaptation theoretical model of expressive writing is limited. Ullrich and Lutgendorf (2002) found that participants whose writing samples included more words related to both negative emotion and cognitive processes than negative emotion or cognitive words only experienced more post-traumatic growth than those whose writing samples contained more negative emotion or cognitive words only. Lepore and Greenberg (2002) showed that writing about a recent relationship breakup led to increased cognitive processing (progressive increase in use of cognitive mechanism words in writing samples) which was related to improved health status as compared to those participants who wrote about a non-emotional topic. Sloan and Marx (2004) suggest that part of the reason for the limited amount of research in the area of the cognitive adaptation theoretical model of expressive writing may be that it is difficult to empirically evaluate. Concepts like information processing are difficult to operationally define.

Of the three main expressive writing theoretical models described, only the cognitive adaptation model provides a potential explanation for expressive writings' potential benefit for chronic dieters following an ego threatening event. In this study cognitive and emotional processes will be examined using the Linguistic Inquiry Word Count (LIWC) program. LIWC is a text analysis program that analyzes writing samples for variables such as emotion processes and cognitive processes by providing a word

count that represents each variable (Pennebaker, Francis, & Booth, 2001). Higher levels of cognitive words and emotional process words are thought to indicate informational processing, which involves assimilating current environmental cues with existing schemas. It is predicted that groups that utilize greater information processing will experience the least interference with later maladaptive behavior, which in this study will be disinhibited eating.

To summarize, expressive writing may be a useful technique in promoting self-awareness and high level thought processes because researchers have shown that verbal emotional disclosure served successfully in this capacity (Heatherton et al., 1993) and there seems to be little difference between written and verbal disclosure on the psychological and physical benefits of emotional expression (Francis & Pennebaker, 1992). In this study, I tested whether to use expressive writing to increase self-awareness and level of thought in an effort to maintain inhibition of eating. In this study, I sought to evaluate expressive writing in a unique way (following an ego threat) and also with a unique population (chronic dieters) with the purposes of producing information processing and increased self-awareness and level of thought.

CHAPTER III

METHODOLOGY

Participants

The participants in this study included 120 female undergraduate college students from a large Southern Plains university. Originally, the goal was to recruit 160 participants to insure that there were 80 participants in the experimental group. This goal was determined so that moderate effect sizes could be detected; however, after slightly less than 67 women had participated in the experimental group in this study, the power and treatment effect size were checked and these values were so low (partial eta squared = .021; power = .203), that it was decided that the additional recruiting to meet the goal of 80 would not make a difference in the results. Female college students were recruited in this study because this population has a high rate of engagement in dieting practices (Heatherton & Wyland, 2003). Only females were used because scores on the Revised Restraint Scale (RRS) may vary depending on gender so selecting a sample of one gender helped to control for this variation (Klem, Klesges, Bene, & Mellon, 1990).

Participants in this study had a mean age of 20.60 years (SD = 3.314). The participants were predominantly Caucasian (n = 90). Other ethnic groups represented in this sample included: African American (n = 10), Native American (n = 20), Asian

American (n = 13), Hispanic American (n = 5), and those who identified themselves as Other (n = 1). The majority of the participants were unmarried (n = 60), while several reported having a partner who they do not live with (n = 46), a few reported living with a partner (n = 10), three reported being married, and only one reported being divorced. The average height for participants in this sample was 64.60 inches (SD = 2.701) and the average weight was self-reported as 140.17 pounds (SD = 39.343). The weights ranged from 93-340 pounds with the modal value falling at 125 pounds. The average amount of exercise the participants reported was 3.73 hours per week (SD = 3.083). Participants reported an average family income between \$40,000 and \$50,000 but the modal household income was greater than \$70,000. Participants were asked to provide their average family income, and judging by the values provided, participants must have reported their parent's income. Participants either resided in the dormitories on campus (n = 55), off campus (n = 54), or in a sorority (n = 11). Of the participants in this study, 40 were freshman, 32 were seniors, 30 were juniors, 15 were sophomores, and three reported being "other." The sample of participants in this study was representative of the undergraduate university population with regard to age, ethnicity, race, sexual orientation, and income.

Measures

The measures that were used in this study will be described next. The Revised Restraint Scale (RRS) was given to participants for the purposes of categorizing them as

chronic dieters or non-dieters and the State Self-Esteem Scale (SSES) and Mood Rating Scale (MRS) were given to participants to provide a manipulation check.

Revised Restraint Scale (RRS; Herman & Polivy, 1980).

The RRS is a 10-item scale that measures weight fluctuation and concern about dieting. The RRS scale was specifically designed to identify the sub-population of dieters who struggle with the tendency for disinhibited eating referred to in the present study as chronic dieters (Heatherton et al., 1988). Individuals who score 15 or higher tend to be preoccupied with weight loss and diet chronically. Among college students, the RRS has been shown to be reliable with .95 test-retest reliability and .82 internal consistency (Allison, Kalinsky, & Gorman, 1992). The RRS had an internal consistency of .78 in the current sample. Scores for each item range from 0-4 or 0-3 depending on the item. For example, one item says, “How often are you dieting?” and the response choices include: never (0 points), rarely (1 point), sometimes (2 points), often (3 points), and always (4 points). Another item reads, “Would a weight fluctuation of 5 pounds affect the way you live your life?” and the response choices include: not at all (0 points), slightly (1 point), moderately (2 points), and very much (3 points). Total scores can range from zero to 35 with scores of 15 or higher indicating chronic dieting status.

State Self-esteem Scale (SSES; Heatherton and Polivy, 1991).

The SSES is a 20-item measure of state self-esteem derived from the Janis-Field Feelings of Inadequacy Scale. The SSES has three correlated factors: performance (e.g., “I feel confident about my abilities”), social (e.g., “I am worried about what other people think of me”), and appearance (e.g., “I feel satisfied with the way my body looks right now”) self-esteem. The composite score measures overall state self-esteem and is more commonly used than the factor scores. I used the composite state self-esteem score in this study. Items are scored on a five point scale (1 = not at all, 2 = a little bit, 3 = somewhat, 4 = very much, and 5 = extremely) with items, 2, 4, 5, 7, 8, 10, 13, 15, 16, 17, 18, 19, and 20 being reverse score items. The SSES has a high degree of reliability with an internal consistency coefficient of .92 and .91 for the current sample. Studies show this measure is valid for detecting state self-esteem changes following laboratory manipulations (Heatherton and Polivy, 1991).

Mood Rating Scale (MRS; King, 2001).

The MRS is a 17-item mood measure of current mood status. Participants rate how strongly they feel on a scale from 0 (“Not at all”) through 6 (“Very Much”) for each mood state presented. Some of the items represent negative moods (i.e., depressed/blue, bored, worried, tired, frustrated, unhappy, angry/hostile, and anxious) and the others represent positive moods (i.e., happy, pleased, self-confident, enjoyment/fun, joyful, aroused/active, anticipating, excited, sociable/friendly, satisfied). The MRS demonstrated adequate internal consistency with the current sample with $\alpha = .86$ and $.88$ for positive emotion and $\alpha = .744$ and $.761$ for negative emotion. The MRS has also been used in

previous research studies to detect mood changes due to a particular research condition such as expressive writing and demonstrated high reliability with internal consistency values of .90 for negative mood and .96 for positive mood (Burton & King, 2004).

Food consumption.

Food was weighed before and after the participants taste tested the food and measured in grams. The difference between the pre- and post-taste test weights equaled the amount of food eaten by each participant (McFarlane et al., 1998). For the current sample used in the current study, the amount of cookies eaten by non-dieters defined normal eating practices while the amount eaten by chronic dieters represented the degree to which chronic dieters experienced eating disinhibition or inhibition.

In the current study, participants were asked questions about the degree to which they practiced restraint when taste testing cookies (on a scale from 1-10 with 1=extreme restraint and 10=no restraint at all) and also whether they normally tried to restrict cookies from their diet (yes or no). Of the total sample (N = 67), 31 participants reported normally restricting cookies from their diet with 89% of the chronic dieters (n = 29) reporting normally restricting cookies from their diet and only 15% of the non-dieters reporting normally restricting cookies from their diet. A univariate analysis demonstrated that those participants categorized as chronic dieters based on RRS scores reported using significantly more restraint when taste testing the cookies than non-dieters based on RRS scores [exact F (1, 65) = 7.114, p. = .01]. A univariate analysis showed there were significant group differences on reported level of restraint when taste testing the cookies

[exact $F(1, 65) = 10.199$, $p = .002$] with individuals who reported regularly restricting cookies from their diet ($M = 6.35$, $SD = 3.115$) reporting higher levels of restraint during the taste testing portion of the experiment than individuals who denied regularly restricting cookies from their diet ($M = 8.63$, $SD = 2.097$). These results indicate that chronic dieters, those who normally inhibit cookie consumption, practiced greater restraint when taste testing the cookies than non-dieters; therefore for chronic dieters low levels of cookie consumption reflected eating inhibition and higher levels of cookie consumption reflected eating disinhibition.

Because by definition non-dieters do not regularly inhibit food consumption they could not be assumed to ever exhibit dietary disinhibition. Non-dieters' eating practices reflect normal dietary habits, therefore the food consumption practices of non-dieters in the current study were viewed as normal dietary responses to the experiment and the chronic dieter's food consumption practices were viewed as resulting from dietary inhibition or disinhibition.

Linguistic Inquiry and Word Count (LIWC) (Pennebaker et al., 2001).

LIWC is a text analysis software program that counts emotional (e.g., negative emotion words), cognitive (e.g., cognitive mechanism words), structural (e.g., articles or pronouns), and process words (e.g., causation or insight words) in written text. LIWC is based on the assumption that individuals' language expression provides information about their psychological world. Analyses include 84 output variables (content categories), such as negative and positive mood words, that are reported as a word count

and represent 80% of the words people use in writing or talking. The LIWC measure of psychological processes indicated in written text has been found to have an adequate degree of external validity as demonstrated by Pearson correlation values of judges' ratings of the word content of college student essays and LIWC output with validity ratings for each variable used in the present study as follows: first person pronouns ($r = .78$ and $.47$), positive emotions ($r = .63$ and $.33$), negative emotions ($r = .75$ and $.38$), cognitive mechanisms (not provided), and present tense verbs (not provided) (Pennebaker et al., 2001).

In the present study, cognitive words, positive emotion words, negative emotion words, first person pronouns, and present tense verbs will be used to define self-awareness. Goleman (1995) described self-awareness as a combination between "metamood," which is awareness of one's mood state, and "metacognition," which is awareness of one's thought processes. Goleman (1995) also described self-awareness as an ability to recognize and name emotional states. Similarly, Mayer (1993) defined self-awareness as not only being aware of one's moods but also the thoughts related to those moods. If self awareness involves awareness of one's own present thoughts and feelings about themselves then a writing topic directing them to write specifically about their own personal thoughts and feelings in the moment should elicit self-awareness. If one is writing with a high degree of self-awareness then their writing content should include a high number of first person pronouns, emotion words, cognitive mechanism words, and present tense verbs. These word counts will be calculated to suggest self-awareness levels of participants in each writing condition and also each group of chronic dieters and non-dieters.

Procedure

Recruitment.

Participants were recruited through the research participant pool at a large Southern Plains university. Individuals not interested in participating or male individuals, who were not eligible, had alternative opportunities for obtaining course credit through other research opportunities such as collaborating with their course instructors to write a paper or attending campus colloquia. When participants signed up for an appointment time on the research participant web-page they received instructions to avoid eating or drinking anything except water for two to three hours prior to their appointment. Participants in this study reported that they had refrained from eating or drinking two to three hours before the experiment on average.

Informed Consent.

I verbally recited the purpose of the study and expectations of the potential participants before any data was collected from any individual participants. For one group of participants (non-failure task participants), written consent provided agreement to complete a demographic sheet, the MRS, and the SSES and to watch a video about Cognitive Neuroscience. For the second group of participants (failure task participants), providing written consent provided consent to complete a demographic sheet, the MRS,

the SSES, and the RRS, and to engage in three different tasks. Participants were told that the purpose of the study was to examine the relationship between cognitive processes, moods, and sensory perceptions. This did not reflect the actual purpose of the study which was to determine the differences in food consumption between groups of chronic dieters who experienced a failure task and were then asked to write about one of two topics. Knowledge of this purpose could have significantly decreased the validity of the study. In this section, I will describe in detail the procedures for the current study from recruitment through the debriefing interview. The current study was a two phase experiment with two groups in the first phase (failure task and non-failure task groups) and four groups in the second phase (chronic dieters in the high self-awareness writing group, chronic dieters in the low self-awareness writing group, non-dieters in the high self-awareness writing group, and non-dieters in the low self-awareness writing group). I will now discuss the procedures each participant went through in the current study.

Deception.

The nature of the research being conducted required a certain amount of deception because knowledge of the true nature of the study could have jeopardized the outcomes. Although there were minimal risks to the participants, such as uncomfortable feelings, I took steps to mitigate any distress they may have experienced by conducting a debriefing at the end of each participant's experiment session. I also disclosed to each participant the risk of uncomfortable feelings as a result of participating in this study during the informed consent process. Only those participants who agreed to that risk by

signing the consent form participated (none declined). The benefits of the deception outweighed the risks, in that the deception allowed for more valid findings that may have provided information that could aid in the treatment of individuals struggling with their weight and experiencing uncomfortable feelings because of it on a daily basis.

Deception techniques in this study involved a failure task, providing a false purpose for the failure task (assess cognitive processes), and providing a false purpose for taste testing the cookies (assess sensory perceptions). The fact that participants' cookie consumption was being monitored was not revealed because it may have lead to decreased food intake (Herman et al., 2003). This would have inhibited my ability to find evidence of connections between cookie consumption and the ego threatening event.

Similarly, knowledge of the purpose for the failure task could have prevented the event from having the desired mood and self-esteem lowering effect required for disinhibited eating. Participants were told they were going to work in solving a puzzle to assess cognitive processes. The puzzle is very difficult to solve quickly, but participants were told that it was very simple and that most adults with average intelligence could solve the puzzle in less than five minutes. It was hoped that this would induce a negative mood and lowered state self-esteem.

The purpose of the study that was presented to the potential participants was to examine the relationship between cognitive processes, mood, and sensory perceptions. Framing the purpose for eating in overeating studies as a taste test or sensory perception task is common (e.g., Ruderman, 1986; Polivy, Herman, & McFarlane, 1994).

Numerous researchers have used similar practices in their research to induce negative mood and to subsequently alter food consumption (e.g., Heatherton, Polivy, &

Herman, 1989; Heatherton, Polivy, & Herman, 1991; Heatherton et al., 1998; Herman et al., 1987; Lattimore & Caswell, 2003; McFarlane et al., 1998; Polivy et al., 1988; Meyer & Waller, 1997; Polivy, et al., 1994; Rotenberg & Flood, 1998; Ruderman, 1985a; Ruderman, 1985b; Sheppard-Sawyer et al., 2000; van Strien et al., 1999). Past research in this area using similar practices indicated that participants experience minimal harm, and the majority of these studies countered the potential for harm by conducting a debriefing before participants left the facility.

Each failure task participant participated in the experimental portion of the study individually. I was able to closely monitor each participant's level of distress during the procedures. Should I have seen non-verbal or verbal signs of high levels of distress (i.e., crying, angry outbursts, statements regarding self-harm), I would have immediately discontinued with the procedures and conducted the debriefing during which participants would have been told the true purpose of the study. Fortunately, not one participant displayed high levels of distress at any point during the experiment. I did not need to discontinue the experiment for any participant due to excess distress. A resource list was also provided to each participant before they left.

During the debriefing I disclosed the real purpose for the study and the purposes for the tasks they participated in. Again, I monitored each participant for verbal and non-verbal signs of extreme distress. If such distress was detected I would have assisted the participants in finding additional support from one of the agencies on the resource list. Thankfully, I did not need to assist any participants in seeking further emotional help and I did not need to elongate the debriefing interview in an effort to sooth or calm a distressed participant. Interestingly, the response many participants had to learning the

true purpose of the study was to smile and/or laugh and a few even made comments about having fun while doing the experiment. They seemed quite relieved to learn that the puzzle was designed for failure as evidenced by sighs of relief, laughing, and comments (i.e., “thank God”). As part of the debriefing, I acknowledged appreciation for the participant’s participation and made sure to highlight the potential benefits of the information gleaned from this study.

Experimental Procedures.

Participants who were recruited for this study were randomly assigned to a failure task group or a non-failure task group. Participants were not aware of which type of session they signed up for at the time they made their appointment. The experimental session for the failure task participants included exposure to a failure task, while the experimental session for the non-failure task participants did not include a failure task. The non-failure task participants served as a control group. Following informed consent, the non-failure task participants were asked to complete mood (MRS) and self-esteem (SSES) measures, which the failure task participants completed following their failure task. To earn the equivalent amount of credit as the participants in the failure task group, who have many more tasks to complete as part of their experiment, the non-failure task participants watched a video about cognitive neuroscience after they took about 10-minutes to complete the necessary measures. Later the scores on the mood and self-esteem measures for the failure task participants and non-failure task participants were

compared to determine whether the failure task had the desired mood and self-esteem lowering effect on the failure task group participants.

After providing informed consent, failure task participants were told they were going to participate in a puzzle solving task to assess cognitive processes. The Spin Out game has been used as a failure task and successfully induced lowered state self-esteem and mood in previous research studies (Heatherton et al., 1993; Heatherton et al., 1998). For a novice, the Spin Out game typically takes approximately thirty minutes to solve; however, there is a simple solution that requires less than 60 seconds. To induce a negative mood and lowered state self-esteem, participants were told that the puzzle was very simple and that most adults with average intelligence could complete the entire test in three to five minutes. They were then timed as they worked the puzzle and at the end of five minutes the researcher asked them to stop. This manipulation was used to induce a negative mood and lowered state self-esteem for all failure task participants.

After completing the MRS and SSES, all failure task participants were randomly assigned to write about one of two writing topics (experimental and control) for twenty minutes for the purpose of increasing self-awareness and higher level thinking among those participants in the experimental writing condition while lowering self-awareness and level of thought among those in the control writing condition. The researcher provided the participant with a pen and several pieces of paper and instructions to write about the topic to which they were assigned for the duration of the twenty minutes without censoring what they wrote. They were told that their writing would remain confidential and anonymous and that this would be achieved by asking them to seal their writing in an envelope, that I provided at the end of the twenty minutes, and then having

them personally place the sealed writing sample randomly into a stack of several other sealed envelopes so as to immediately dissociate the identity of the participant from their writing. They were told that their writing would later be read and analyzed along with writing pieces from the other participants to allow for content analysis, however, their identity would not be associated with their writing sample. The purpose of letting participants know that their writing samples would be sealed in an envelope and randomly placed in a stack of envelopes with other participants' was to insure participants felt comfortable in writing freely about their thoughts and feelings for the duration of the twenty minutes without fear of their identity being known to myself. I asked if the participant had any questions and then left the room for twenty minutes.

The first writing condition instructed participants to focus on their thoughts and feelings about themselves in the moment and write deeply and honestly about them for twenty minutes. The written instructions they received were as follows:

Take a moment to think about your feelings about yourself in this moment. How do you feel about yourself? Take some time to let these emotions emerge and experience those feelings mentally and physically. Determine the thoughts about yourself associated with those emotions. For the next twenty minutes, please write about these feelings and thoughts about yourself as deeply and expressively as you can. Please write honestly and openly for the entire time without stopping.

Increasing self-awareness in one group was important because I am examining whether high self-awareness through writing allows chronic dieters to maintain dietary inhibition. In a similar study, Heatherton et al. (1993) showed that self-awareness may help inhibit food consumption among chronic dieters, following an ego threatening event (Heatherton et al., 1993). Heatherton et al. (1993) asked participants to *talk* about their thoughts and feelings while watching themselves fail at a task on video to increase self-awareness. Dixon and Baumeister (1991) had participants in their study write an essay

about future goals to induce a highly self-focused state. The current study used a similar approach, but asked them to write about rather than talk about their thoughts and feelings in the moment.

The second group served as a control group and each participant was asked to write about the room she was sitting in for twenty minutes. The instructions these participants received were as follows:

For the next twenty minutes I would like you to describe the room that you are sitting in with as much detail as you can. The important thing is to write only a description about the room without stopping for the entire time.

Expressive writing researchers often use a writing condition that requires writing about an affectively neutral topic to allow for comparison to groups writing about more emotional topics as writing about emotionally charged topics produces the therapeutic effects (e.g., Sloan & Marx, 2004; Ullrich & Lutgendorf, 2002).

After the experimental and control writing groups wrote for twenty minutes, I returned and asked the participants to fold the pieces of paper, seal them in an envelope, and place the envelope in the stack of envelopes from other participants. At this point the participant was told that she had been randomly selected to participate in the taste perception task for this experiment. Three large pre-weighed plates of three different types of cookies were placed in front of the participant with a glass of water and a dummy scoring sheet with questions about taste, texture, aroma, etc. Cookies were used in this study as the food for taste testing because cookies are commonly used as an enticing food that elicits disinhibited eating among chronic dieters (Rotenberg & Flood, 1998; Tice, et al., 2001). One consideration was whether participants would like the cookies or not and how their preferences would affect the results. To control for

participant preference, a question was added to the taste testing dummy questionnaire to assess preference for cookies. Participants were asked to rate on a scale from 1-5 how much they like the cookies and the results for this item were used as a covariate in later analyses. Allowing for the statistical control of cookie preference in later analyses was conservative because past research has actually indicated that degree of liking does not influence disinhibited eating (Schachter, 1968; Polivy et al., 1994). Polivy et al. (1994) had chronic dieters and non-dieters taste test cookies that were pilot tested and deemed “good tasting” and “bad tasting” after inducing stress and anxiety and found that chronic dieters ate more following the anxiety mood induction regardless of flavor of cookies.

After being provided with the plates of cookies participants I informed them that I was going to step out of the room for a few minutes to prepare materials for the next portion of the study. The participants were encouraged to eat as many cookies as they needed to accurately complete the taste test measure. I asked if they had any questions before leaving the room. At the end of the five minutes, I re-entered the room, removed the plate of cookies, and collected the taste test measure the participant completed. At this time I asked the participants to complete one last packet of questionnaires which included the MRS, the SSES, the RRS, and a demographic sheet. When the participant completed the MRS, SSES, RRS, and the demographic sheet, I asked the participant a few questions before she left. At this time I conducted a brief interview with questions about the participant’s experience during the experiment to determine whether the data gathered from this participant would be considered valid. They were asked what they thought the purpose of the study was to confirm that they did not have suspicions about the true purpose. Of the total number of participants (N = 67) only one participant reported being

suspicious of the true nature of the study. This participant also reported that although she was suspicious she did not have any idea what the real purpose of the study was. I concluded that the study design was not jeopardized due to participant awareness of deception.

Finally, I told participants the true purpose of the study as well as the true purpose for each task she participated in. They were asked not to discuss the details of this study with other potential participants. I also informed them that should they desire counseling or additional assistance for their moods, self-esteem, or eating habits they could contact one of several agencies that were listed with contact information on a handout.

The benefit to conducting this debriefing immediately following the experiment was that it minimized risk to the participants. This debriefing may have served as a threat to validity as many of the participants may have know one another either through sharing classes together, attending the same university, living in the dorms together, or being in the same sorority, and that through these common relationships participants could have informed one another of the real purpose of the study before some had the chance to participate in data collection. Knowledge of the true purpose of the study could have invalidated the data, so reasonable measures that could be taken to deceive participants without harming them were utilized. The literature guided the researcher's decision to conduct the debriefing immediately following the experiment as many researchers in this field of overeating who employ similar deceptive methods often conduct debriefings at the end of the data collection session without any adverse effects on the data reported (Heatherton et al., 1998; Herman et al., 1987; Lattimore & Caswell, 2003; Meyer &

Waller, 1997; Polivy et al., 1988; Polivy et al., 1994; Rotenberg & Flood, 1998; Ruderman, 1985a; Sheppard-Sawyer et al., 2000).

The goal of the debriefing was to mitigate any adverse reaction participants may have had to the study's procedures. The researcher monitored the participant's behavior during the experimental session for overt signs of distress such as crying, angry outbursts, or threats of harm to self or others. The debriefing was expected to take approximately 10 minutes, however, I did not conclude debriefing sessions until I felt confident that the participant was not in acute distress. All participants were provided with a resource list should they determine they needed additional assistance.

Research Design and Statistical Analysis

The design for this study was a 2 (diet status) X 2 (writing condition) analysis of variance. Writing conditions (high self awareness versus low self-awareness) and dieting status (chronic dieters versus non-dieters) served as the between-subjects factors in the analyses. The dependent variables that were examined with this analysis included cookie consumption, linguistic markers of self-awareness, and positive mood, negative mood, and state self-esteem following cookie consumption. A 2-group (failure task versus non-failure task) MANOVA was done to assess whether the failure task had the desired ego threatening effect of simultaneously lowering of mood and state self-esteem.

Analyses of Covariance (ANCOVA)

A 2 (diet status) X 2 (writing condition) analysis of covariance (ANCOVA) was conducted to test the first hypothesis, which stated there would be no group differences on cookie consumption following a failure task depending on writing topic (high self-awareness vs. low self-awareness) and dieting status (chronic dieter vs. non-dieter) while controlling for level of cookie preference. Participants were asked to rate how much they liked cookies on a scale from one to five (1 = Hate cookies, 5 = Love cookies) as part of the Taste Test survey. The responses to this item were correlated with grams of cookies consumed, so the responses to this item were used as the covariate for the ANCOVA.

A 2 (diet status) X 2 (writing condition) multivariate analysis of variance (MANOVA) was conducted to test the second hypothesis, which stated, there would be no group differences between chronic dieters and non-dieters on linguistic markers of self-awareness (first person pronouns, negative emotion words, positive emotion words, cognitive mechanisms, and present tense verbs). A multivariate version of the ANOVA was used because there was a high degree of significant correlation between the linguistic marker dependent variables being used to define self-awareness. In situations such as this, the multivariate test is more powerful than separate univariate tests because it accounts for more of the variance than separate univariate tests.

A 2 (diet status) X 2 (writing condition) MANCOVA was conducted to determine the significance of the third hypothesis which stated, there would be no group differences on measures of negative mood, positive mood, or state self-esteem following cookie consumption depending on dieting status (chronic dieters vs. non-dieters) and writing condition (high self-awareness versus low self-awareness) while controlling for negative mood, positive mood, and state self-esteem scores obtained before the writing task. The

multivariate test was used to assess the group differences for mood and self-esteem because these dependent variables were highly significantly correlated. The negative emotion, positive emotion, and state self-esteem scores that were obtained following the failure task but prior to the writing task were used as covariates in this analysis as these values were highly significantly correlated with the dependent variables as well.

CHAPTER IV

FINDINGS

Introduction

The general aim of this study was to understand how preventing the escape of negative emotions by increasing self-awareness affects disinhibited eating. Specifically, I examined the effect a failure task and expressive writing with high and low degrees of self-awareness had on a sample of chronic dieters' and non-dieters' food consumption. Secondary purposes were to compare the level of self-awareness indicated in the expressive writing samples with writing samples of a control topic, and to examine the differences between chronic dieters and non-dieters across both writing topics on mood and self-esteem following cookie consumption. Before I continue to explain the analyses conducted to test the research questions laid out here, I review the organization of the current chapter.

In the current chapter, I describe the preliminary analyses that I conducted to describe the demographic characteristics of the groups, determine whether the failure task had the desired mood lowering effect, and also provide some descriptive information about the writing samples for the experimental and control writing groups. Then I discuss the analyses necessary to answer the primary and secondary research questions. The

analyses that I discuss to answer the research questions include the following. To test the effect a failure task and expressive writing with various degrees of self-awareness had on a sample of chronic dieters' and non-dieters' food consumption, a 2 (dieting status) X 2 (writing topic) ANCOVA for cookie consumption was done. To compare levels of self-awareness indicated in the expressive writing samples with writing samples of a control topic, a 2 (dieting status) group MANOVA for linguistic markers of self-awareness was done. In the high self-awareness writing topic participants wrote about their thoughts and feelings about themselves in the moment, so the linguistic markers I selected to represent high self-awareness included first person pronouns, present tense verbs, negative emotion words, positive emotion words, and cognitive mechanism words. To test the differences between chronic dieters and non-dieters across both writing topics on measures of mood and state self-esteem levels following cookie consumption, a 2 (dieting status) X 2 (writing topic) MANCOVA for positive and negative mood and state self-esteem following cookie consumption was done. Before I continue with further descriptions of the research question analyses, it is important that I first review the preliminary analyses that will lay the ground work for answering the research questions.

Statistical Analyses

Preliminary Analyses.

The design of the current study was a 2 (writing topic) X 2 (dieting status) analysis of variance. To evaluate whether the four groups were equal in terms of demographic variable distribution, a series of univariate analyses were done to compare the four groups on body mass index ($p = .994$), age ($p = .405$), and income ($p = .725$). There were no significant differences between the groups on any of these variables.

The purpose for this study was to understand how preventing the escape of negative emotions by increasing self-awareness affects disinhibited eating. In order to examine the effect self-awareness through writing has on disinhibited eating following increased negative moods and lowered state self-esteem, the participants needed to experience lowered state self-esteem and mood. To insure that all participants were experiencing a negative mood and self-esteem state, they underwent a failure task. To determine whether the failure task had the desired effect of causing lowered mood and state self-esteem, a 2-group MANOVA was used to compare scores on negative mood, positive mood, and state self-esteem between a group of participants who experienced the failure task and participants who did not experience the failure task. The overall MANOVA revealed a significant difference between the failure group and non-failure group on the set of dependent variables [exact $F(3, 114) = 2.765$, $p = .045$]. An examination of the means and standard deviations [See table 1 (Appendix M)] revealed that participants in the failure task group scored lower on positive mood, higher on

negative mood, and lower on state self-esteem than participants in the non-failure task group.

To further describe the differences between the failure task group and the non-failure task group on negative and positive mood scores and state self-esteem scores, a discriminant function analysis was conducted with positive mood, negative mood, and state self-esteem scores. Results indicated one significant function [$\chi^2(3) = 8.047, p = .045$], with a canonical correlation of .258. Positive emotion (.989) and state self-esteem (.439) loaded positively on this function while negative mood (-.378) loaded negatively on the function. Group centroid findings revealed that those who participated in the failure task (-.236) scored differently on measures of mood and state self-esteem from those who did not participate in the failure task (.289). Basically, those in the failure task group reported feeling less positive mood, lower state self-esteem, and higher negative mood than those who did not participate in the failure task.

To further validate the results of the mood induction as measured by self report measures, participants were asked during the interview portion of the experiment to rate how they felt in hindsight on a scale from 1-10 (1 = great, 10 = awful) before and after the failure task. A univariate analysis comparing the means of pre-failure task mood and post-failure task mood ratings revealed a significant difference between pre-failure task mood and post-failure task mood [exact $F(1, 132) = 89.270, p = <.001$] indicating that participants felt significantly worse after the failure task ($M = 6.62, SD = 2.08$) versus before the failure task ($M = 3.43, SD = 1.82$). These results indicate that the failure task had the desired ego threatening effect on simultaneously lowering mood and state self-esteem for participants who experienced it. It was necessary for the participants in the

failure task group in the current study to experience a state of lower mood and state self-esteem because in order to answer the research questions the study was designed to test, the participants had to be in a state of lower mood and state self-esteem.

Writing Assignment. Participants were provided with instructions to write about either their thoughts and feelings in the moment about themselves (high self-awareness) or a non-emotional description of the room they were sitting in (low self-awareness). Due to non-normal distributions of the linguistic marker variables within the writing condition groups, statistical comparisons could not be expected to provide valid results. The non-normal distribution of the data was so extreme that non-parametric statistical analyses would not have corrected the problem. Instead I direct the reader to a summary of descriptive information about the writing content of each group. Please refer to table 2 (Appendix M) for a display of the means and standard deviations for each linguistic marker of self-awareness for each writing condition. In general the low self-awareness writing condition used fewer first person pronouns, positive emotion words, negative emotion words, cognitive mechanism words, and present tense verbs. It is assumed that the participants were compliant with the writing instructions they were provided.

Research Questions

Research Question One: Are there group differences on linguistic markers of self-awareness (negative emotion words, positive emotion words, cognitive mechanism words, first person pronouns, and present tense verbs) between chronic dieters and non-

dieters? The null hypothesis is that there will be no group differences on linguistic markers of self-awareness between non-dieters and chronic dieters. A 2-group MANOVA was conducted to compare chronic dieters and non-dieters on the linguistic markers of self-awareness. Results showed group differences were not statistically significant [exact $F(5, 61) = .1.337, p. = .261$]. See Table 4 (Appendix M) for a summary of the means and standard deviations. These results indicate that chronic dieters and non-dieters did not significantly differ in their use of the linguistic markers of self-awareness, but chronic dieters may have used more cognitive mechanism words and positive pronouns than non-dieters. In general, however, the null hypothesis is retained.

Research Question Two: Are there group differences in cookie consumption following a failure task depending on dieting status (chronic dieters versus non-dieters) and writing topic (high self-awareness versus low self-awareness) while controlling for the degree to which participants like cookies? The null hypothesis is that there will be no group differences in cookie consumption following a failure task regardless of dieting status and writing topic while controlling for the degree to which participants like cookies. Participants were asked to rate how much they liked cookies on a scale from one to five. The responses on this scale were correlated with the dependent variable (grams of cookies consumed), so the responses on the cookie preference scale were used as a covariate. Body mass index (BMI; weight in kilograms divided by height in meters squared) refers to a weight to height ratio used for assessing body mass. The relationship BMI values had with the dependent variable, cookies, were examined and no significant relationship was found ($p = .626$), so BMI was not controlled for.

A 2 (chronic dieters vs. non-dieters) X 2 (high self-awareness writing condition vs. low self-awareness writing condition) ANCOVA was done to compare the groups on cookie consumption. See Table 3 (Appendix M) for the sums of squares, degrees of freedom, omnibus F-values, and p-values for this analysis. There was no statistically significant interaction effect [exact $F(1, 62) = 1.307, p = .257$] or significant main effect for dieting status [exact $F(1, 62) = 2.177, p = .145$], or writing condition [exact $F(1, 62) = .190, p = .665$]. The lack of significant differences between the groups indicates that dieters did not demonstrate disinhibited eating following the writing and failure tasks. Chronic dieters typically restrict caloric intake, so if the chronic dieters had eaten more than the non-dieters it would have been concluded that they had disinhibited their eating when eating the cookies. The fact that they did not consume significantly more cookies than the non-dieters suggests that they maintained some degree of dietary inhibition.

Defining disinhibited eating in terms of cookie consumption among chronic dieters depends on the fact that chronic dieters normally restrict their cookie intake. A second analysis examined disinhibited eating in terms of cookie consumption among those who regularly restrict their cookie consumption versus those who do not normally restrict their cookie consumption. During the interview at the end of the experiment, participants were asked whether they would normally restrict cookies from their diet. Participants were asked to respond “yes” or “no.” A 2 X 2 ANOVA was done to compare groups depending on writing topic (high self-awareness vs. low self-awareness) and cookie restriction tendency (yes or no) rather than dieting status on grams of cookies consumed. Results showed there were no statistically significant interaction effects [exact

$F(1, 57) = .040, p = .843$, or main effects for writing topic [exact $F(1, 57) = .322, p = .572$], or cookie restriction practices [exact $F(1, 57) = .114, p = .736$].

The results from the 2 (writing topic) X 2 (dieting status) ANCOVA and the 2 (writing topic) X 2 (cookie restriction tendency) ANOVA indicate a failure to reject the null hypothesis. Cookie consumption in this study did not appear to differ depending on dieting status, cookie restriction practices, or level of self-awareness induced through writing condition. The chronic dieters and cookie restrictors in this study did not consume significantly more cookies than the non-dieters, indicating maintenance of dietary inhibition.

Research Question Three: Are there group differences on measures of mood and state self-esteem following cookie consumption depending on dieting status (chronic dieters versus non-dieters) and writing topic (high self-awareness versus low self-awareness) while controlling for negative mood, positive mood, and state self-esteem scores obtained between the mood induction and the writing task? The null hypothesis is that there will be no group differences on measures of mood and state self-esteem following cookie consumption depending on dieting status and writing topic while controlling for negative mood, positive mood, and state self-esteem scores obtained between the mood induction and the writing task. Participants completed mood and self-esteem measures at two points during this experiment. The first time they completed these measures was following the mood induction failure task as a means for validating that the mood induction had the desired effect. Participants completed the self-esteem and mood measures for the second time after they had taste tested the cookies, but before they

were told the purpose of the study. I sought to determine the mood and self-esteem differences between the groups following cookie consumption without the effect of the mood induction confounding the results. Because of this, I decided to use the mood and self-esteem scores obtained following the failure task as covariates. Negative mood scores, positive mood scores, and state self-esteem scores, completed after participants taste tested the cookies, were analyzed with a 2 (dieting status) X 2 (writing condition) MANCOVA with negative mood, positive mood, and state self-esteem scores obtained immediately following the failure task being used as covariates. See Table 5 (Appendix M) for a summary of this analysis. There was no significant interaction effect [exact F (3, 58) = 1.757, p. = .165] or significant main effects for writing topic [exact F (3, 58) = 1.679, p. = .182] or dieting status [exact F (3, 58) = 2.369, p. = .080].

An examination of the univariate analyses for each of the dependent variables including negative emotion, positive emotion, and state self-esteem obtained following cookie consumption follows. See Table 6 (Appendix M) for a summary of the series of univariate analyses on each of the dependent variables.

For negative mood, there was a significant interaction effect [exact F (1, 60) = 5.336, p. = .024] with chronic dieters in the high self-awareness writing condition (M = 18.00, SD. = 5.29) scoring significantly higher on negative mood following cookie consumption than chronic dieters in the low self-awareness writing condition (M = 14.80, SD = 3.33), non-dieters in the high self-awareness writing condition (M = 14.56, SD. = 4.68), or non-dieters in the low self-awareness writing condition (M = 14.61, SD = 5.41).

Univariate analyses for positive mood failed to demonstrate significant interaction effect [exact F (1, 60) = .161, p = .689] or main effects of writing topic [exact F (1, 60) =

.813, $p = .371$], or dieting status [exact $F(1, 60) = 3.955$, $p = .051$]. Univariate analyses for state self-esteem showed no interaction effect [exact $F(1, 60) = .157$, $p = .693$] or main effect by dieting status [exact $F(1, 60) = .136$, $p = .714$]. There was however, significant differences between those in the high self-awareness writing topic and those in the low self-awareness writing topic [exact $F(1, 60) = 4.328$, $p = .042$] with those in the high self-awareness writing topic ($M = 70.12$, $SD = 14.28$) reporting lower state self-esteem than those in the low self-awareness writing condition ($M = 75.52$, $SD = 8.71$).

To remind the reader, the research question the previous analyses were attempting to test was whether there were group difference on measures of mood and state self-esteem following cookie consumption depending on dieting status and writing topic while controlling for negative mood, positive mood, and state self-esteem scores obtained between the mood induction and the writing task. The results to the analyses discussed in the previous paragraphs suggest that one would reject the null hypothesis and conclude that chronic dieters in the high self-aware writing condition scored significantly higher on negative mood scores than chronic dieters in the low self-aware writing condition or non-dieters in either writing condition following cookie consumption.

CHAPTER V

CONCLUSION

The purpose of this study was to assess whether heightened self-awareness induced through expressive writing would help chronic dieters maintain dietary inhibition following an ego threatening event (i.e., lowered state self-esteem and mood). I provide a brief summary of the methodology used in the current study. Participant dieting status was assessed with the Revised Restraint Scale (RRS) and participants were categorized as either chronic dieters or non-dieters. Chronic dieter and non-dieter women were exposed to a failure task which served as an ego threatening event and were then randomly assigned to either a high self-awareness or low self-awareness writing condition. After twenty minutes of writing, participants were given plates of cookies to “taste test.” I now review the organization of the rest of the chapter.

The current chapter will provide a summary of the research findings from the current study. Each research question will be discussed in terms of the theoretical implications of the results found in the current study. Once I have discussed and summarized the findings, I review possible limitations. Considering the outcomes, the literature on which this study was based, and the limitations, I suggest implications for future research. Finally, I review the implications the current study has for the practice of psychology.

Preliminary Analyses

Before I discuss the findings from the research questions I want to explain the results of the manipulation check analyses. The failure task was an important component of the current study because all of the outcomes measured to answer the research questions were based on the fact that the participants were experiencing low state self-esteem in conjunction with lowered mood state. Participants who did not participate in the failure task completed the same mood and state self-esteem measures the participants in the failure task group completed after the failure task. The scores on the mood and state self-esteem measures for the failure task and non-failure task participants were compared and the analyses revealed that the participants in the failure task group had lower mood and state self-esteem than those in the non-failure task. The failure task had the desired mood and state self-esteem lowering effect.

I concluded that the writing topic instructions I provided to the participants had the desired effect of prompting participants to write in either a highly or minimally self-aware manner based on descriptive information about the writing content of each participants' writing sample. In general those in the high self-awareness writing condition used more first person pronouns, cognitive mechanism words, present tense verbs, negative emotion words, and positive emotion words. This indicates that participants were compliant with the writing instructions they were provided.

Research Questions

In reviewing the research questions for the current study, the reader should know that the first two research questions I will discuss refer to two different tasks the participants in the current study performed (i.e., expressive writing and cookie tasting). Neither of these two research questions is necessary to explain the other, but both the outcomes for the first and second research question are necessary for drawing conclusions about the third research question. I begin by explaining the results of the first and second research question and finish with a discussion of the third research question and how it relates to the first and second ones.

The first research question I address is whether chronic dieters, who have a tendency to escape aversive self-awareness, were able to write with an equivalent degree of self-awareness as the non-dieters. I used linguistic markers of self-awareness in the participants' written text samples with the LIWC program to suggest the level of self-awareness of the writer. I compared the linguistic markers of self-awareness between chronic dieters and non-dieters across the high and low self-awareness writing groups to determine whether chronic dieters wrote with the same degree of self-awareness in each writing topic group as the non-dieters.

The reason the first research question was important to explore was because a major tenet of the Escape Theory is that chronic dieters seek to escape awareness of themselves and aversive emotional states following an ego threatening event (Heatherton & Baumeister, 1991). It is thought that maintaining high self-awareness aids chronic dieters in meeting future weight loss goals by helping them maintain self-regulation over dietary impulses (Heatherton & Baumeister, 1991). Despite the benefits chronic dieters receive from maintaining high self-awareness, they usually seek to escape aversive self-

awareness, which then leads to eating disinhibition (Heatherton & Baumeister, 1991). In this way chronic dieters could be compared to those with avoidant coping styles since both groups have a tendency to escape or avoid aversive emotional experiences (Paxton & Diggins, 1996). Research has shown that those with avoidant coping styles in general are less likely to label their thoughts and feelings with words and less likely to focus attention on the present moment than those with healthy coping styles (Baer, Smith & Allen, 2004). It was expected that chronic dieters in the current study would use fewer self-awareness linguistic markers in their writing samples than non-dieters.

When the linguistic markers of self-awareness for chronic dieters' and non-dieters' writing samples were compared, results showed that following a failure task chronic dieters and non-dieters did not differ significantly in their style of writing about themselves or a neutral topic. Chronic dieters and non-dieters did not significantly differ in the number of first person pronouns, cognitive mechanism words, negative emotion words, positive emotion words, or present tense verbs utilized in their written text, which suggested both groups wrote with equivalent levels of self-awareness. Keep in mind that the preliminary analyses showed also that the linguistic markers of self-awareness from the written text samples of those in the high and low self-awareness writing conditions differed in the expected directions (e.g., using more first person pronouns in the high self-awareness group). The conclusion is that chronic dieters in the high self-awareness writing condition used more linguistic markers of self-awareness than chronic dieters in the low self-awareness writing condition, but within the high and low self-awareness writing conditions the chronic dieters and non-dieters did not differ in the amount of self-awareness linguistic markers they used. In this study, chronic dieters, who typically

escape awareness of themselves and their emotions following an ego threatening event, demonstrated self-awareness in their written text when directed to write about their thoughts and feelings in the moment. The results of the current study suggest that expressive writing may be an effective way to increase self-awareness following an ego threatening event among chronic dieters and non-dieters despite the fact that chronic dieters have a tendency to avoid self-awareness following an ego threatening event (Heatherton & Baumeister, 1991). In the current study, chronic dieters and non-dieters were not different with respect to their ability to write in a high or low self-awareness manner. I now summarize the outcome for the second research question.

In the second research question, I examined the writing topic and dieting status group differences in cookie consumption. Cookie consumption represented the degree to which chronic dieters exhibited dietary inhibition versus dietary disinhibition. Since non-dieters do not regularly restrict their eating, the amount of cookies they consumed represented normal eating pattern responses to the experimental conditions. If chronic dieters consumed significantly more grams of cookies than non-dieters in their writing topic group, then it would be said that the chronic dieters exhibited dietary disinhibition. Because non-dieters' eating behaviors reflect normal responses to the experimental manipulations, chronic dieters who eat more than the non-dieters would be said to exhibit disinhibited eating. If the chronic dieters consumed less than or equivalent amounts of grams of cookies than the non-dieters in the same writing topic group, it would be concluded that chronic dieters exhibited dietary inhibition. In the current study chronic dieters did not significantly differ from non-dieters in the amount of cookies consumed regardless of writing condition. This finding is somewhat surprising because according to

Escape Theory, chronic dieters are prone to engage in disinhibited eating when they escape self-awareness (Heatherton & Baumeister, 1991). In having chronic dieters and non-dieters write about a topic that required very little self-awareness, I directed participants to be in a state of low self-awareness. Based on Heatherton and Baumeister's (1991) Escape Theory, I expected chronic dieters in the low self-awareness writing topic group to exhibit disinhibited eating following the failure task and chronic dieters in the high self-awareness writing topic to maintain dietary disinhibition since increased self-awareness has been shown to help chronic dieters maintain dietary inhibition following a failure task (Heatherton et al., 1993). The lack of significant group differences in cookie consumption in the current study was unexpected. Recall that the number of past laboratory studies that have demonstrated that the normal response to an ego threatening event for most chronic dieters is disinhibited eating (i.e., eating significantly larger amounts of food than non-dieters) (Cools et al., 1992; Costanza et al., 2001; Heatherton et al., 1991; Heatherton et al., 1998; Herman et al., 1987; Kirschenbaum & Dykman, 1991; Lattimore, 2001; Lattimore & Caswell, 2003; Meyer & Waller, 1997; Polivy et al., 1994; Rotenberg & Flood, 1998; Ruderman, 1986; Sheppard-Sawyer et al., 2000). Not only laboratory studies show that chronic dieters abandon dietary restraint practices following an ego threatening event but naturalistic studies have also confirmed this phenomenon (Stice, Akutagawa, Gaggar, and Agras, 1998). Based on a large volume of literature, it was expected that chronic dieters assigned to the low self-awareness writing topic would consume more grams of cookies than the non-dieters or the chronic dieters in the high-self-awareness writing condition. The chronic dieters in the low self-awareness writing condition did not differ from the chronic dieters in the high self-awareness

writing condition or the non-dieters in either writing condition on grams of cookies consumed, suggesting that the chronic dieters were able to maintain some level of dietary inhibition despite their level of awareness or the ego threatening event.

Possible explanations for the non-significant group differences found between the writing condition groups and the dieting status groups may have been that the cookies were not appetizing enough to entice the participants into disinhibited eating. However, other researchers have shown that regardless of taste and flavor preference, chronic dieters exhibit disinhibited eating following an ego threatening event (Polivy et al., 1994). Also, participants in this study were asked during the interview portion at the end of the experiment whether they refrained from eating the cookies during the taste test because they disliked them and no participants reported doing this. With that said, it is still within the realm of possibility that the participants' eating behaviors were somewhat influenced by the palatability and appearance of the cookies they were presented.

Another possible explanation for the non-significant differences between the groups on grams of cookies eaten may be related to the strength of the ego threatening event. The ego threatening event, although shown through statistical analyses to have the desired effect, may not have been strong enough to drive chronic dieters to disinhibited eating. The 20-minute writing task delayed the presentation of the cookies, so it is possible that although the results of the analyses done on the mood and self-esteem measures revealed an effect, the effect may have not been strong enough to last twenty minutes.

The fact that the chronic dieters were able to maintain dietary restraint over the cookies following an ego threatening event and the expressive writing task, also says

something about expressive writing. The cognitive adaptation theoretical explanation for the efficacy of expressive writing suggests that the reason expressive writing is useful is because it allows the writer to assimilate novel stimuli with existing schema, so that the writer can move past thoughts, intrusive images, impulses, and maladaptive behaviors related to the stimuli. If the writing task was successful in assisting those in the high self-awareness writing condition to maintain dietary inhibition despite the ego threatening experience, then it may be because it allowed the participants to assimilate their thoughts about the ego threatening event and themselves into existing schema they already had about their abilities when faced with a challenging task.

To answer the third research question, I tested the group differences between the chronic dieters and non-dieters across the two writing topic conditions on measures of mood and state self-esteem obtained after the participants taste tested the cookies. The mood and state self-esteem scores obtained immediately following the failure task and prior to the writing task were controlled for. The results showed that in general the chronic dieters felt worse after writing and taste testing the cookies than the non-dieters and writing about the high self-awareness writing topic for chronic dieters and non-dieters led to decreased state self-esteem. But chronic dieters in the high self-awareness writing condition reported significantly more negative mood than chronic dieters in the low self-awareness writing condition or non-dieters in either writing condition. The results of this last research question may assist in explaining why the groups did not differ in the amount of grams of cookies they consumed.

The group differences in the mood scores obtained following cookie consumption indicate that the possible reason the chronic dieters in the low self-awareness writing

condition were able to maintain dietary inhibition was because they may have already escaped the aversive emotional experience resulting from the ego threatening event through writing a neutral description of the room. By the time the cookies were offered to them, they may not have had an aversive emotional experience to escape from. In the next section I will discuss a possible explanation for the reason that the chronic dieters in the low self-awareness writing group may have escaped their negative mood by the time the cookies were introduced.

The low self-aware writing task may have acted as a substitute for escaping the aversive emotional experience elicited with the failure task. The reason eating aids the escape from an aversive emotional experience for the chronic dieter is because of cognitive narrowing (Baumeister, 1991). Cognitive narrowing involves narrowing one's attention to immediate sensory stimuli such as food. In focusing attention on the immediate stimuli, one is diverting attention and awareness away from the self and negative emotions and low state self-esteem (Heatherton & Vohs, 1998). Heatherton and Vohs (1998) suggested that stimuli of a cognitive narrowing nature requires attention, and includes physical sensation and mechanical activity. Eating is an activity that requires attention and includes physical sensation (smell and taste) and mechanical activity (movement of chewing and lifting food with hands). Writing may be another activity that is immediate (requires attention to the activity in the moment), includes physical sensation (touch and sight), and mechanical activity (manual use of a pencil). Writing may serve as a way to cognitively draw one's attention away from the self including one's negative mood and state self-esteem. Writing requires attention to the topic being written about, so if the topic is the self then it could enhance self-awareness,

but if one is writing a physical description of the room, as participants in this study did, then attention would be directed away from the self to that topic. The ways in which the writing task parallels the activity of eating may explain why the chronic dieters in the low self-awareness group have been able to maintain dietary inhibition, but it does not explain why the chronic dieters in the high self-aware writing condition were also able to maintain dietary restraint.

Chronic dieters in the high self-aware writing condition demonstrated dietary inhibition: the amount of cookies they consumed was not significantly different from the amount eaten by the non-dieters. Heatherton and Baumeister (1991) emphasized the importance of self-awareness in maintaining self-regulation over eating behaviors in their Escape Theory. Heatherton et al., (1993) did demonstrate in one study that increased self-awareness in a group of chronic dieters assisted in dietary inhibition, and a similar outcome was anticipated in the current study. The reason self-awareness was expected to help chronic dieters maintain dietary inhibition is because with self-awareness comes more meaningful and complex thought that connects the chronic dieter to future goals, including the goal of weight loss (Heatherton & Baumeister, 1991). As predicted chronic dieters in the current study in the high self-awareness writing group maintained dietary inhibition. Unexpectedly though, the chronic dieters who were assigned to the low self-awareness writing condition also exhibited eating inhibition. The results of the third research question reflect two very different reasons for both groups of chronic dieters maintaining restraint. In the third research question I asked whether the groups differed in their responses on mood and state self-esteem measures after completing both the writing task and the cookie taste testing task. The chronic dieters in the high self-awareness

writing group had significantly higher negative mood scores than the chronic dieters in the low self-awareness writing group, but yet their cookie consumption did not differ from the chronic dieters in the low self-awareness writing group. It seems that the chronic dieters in the high self-awareness writing condition maintained dietary inhibition due to the self-aware state they were encouraged to be in through writing and the chronic dieters in the low self-awareness writing condition may have been able to maintain dietary inhibition because they had already escaped the negative mood experience by writing.

In examining the third research question, it should also be noted that the chronic dieters in the high self-awareness writing condition reported higher levels of negative mood than non-dieters in both writing conditions. An explanation for this may be that the differences between chronic dieters and non-dieters may precede the onset of an ego threatening event. It is possible that chronic dieters may be more self-aware and hyper critical of themselves as compared with non-dieters. When an ego threatening event results, the chronic dieters may interpret the situation in a more self-deprecating manner than non-dieters creating a stronger desire to escape the aversive experience than non-dieters may experience. Maybe it is not the tendency to escape aversive experiences that differentiates a chronic dieter from a non-dieter, but the level of self-focus and self-criticism that they maintain. It is possible that all people (i.e., avoidant copers, non-dieters, chronic dieters, etc.) would seek to escape awareness of themselves once a certain level of aversive self-awareness was reached and that chronic dieters (and other avoidant copers) maintain a level of self-awareness closer to that point than non-dieters. If chronic dieters maintained a higher level of self-awareness than non-dieters, then less situational

prompting would be needed for chronic dieters to reach the level of aversive self-awareness that leads to escape.

In the current study, the chronic dieters in the high self-aware writing condition may have expressed higher levels of negative mood following cookie consumption than the non-dieters in either writing condition because that may be the norm. The chronic dieters in the low self-awareness writing condition may have endorsed mood levels similar to those of the non-dieters in both writing groups because they were permitted to escape their aversive self-focus. Escaping aversive mood experiences for chronic dieters may not lead to decreases in negative mood below non-dieters, but merely decreases in mood to that which may be considered “normal” if non-dieters were used to represent the norm.

To conclude, this study demonstrated that expressive writing may be an effective way to induce high self-awareness or low self-awareness. Despite the fact that chronic dieters have a tendency to escape aversive emotional experiences through eating, they have the ability to write in as highly a self-aware manner as non-dieters if directed to following the onset of an aversive emotional experience. Also, the results of this study suggest it is possible that one of two things leads to maintenance of dietary inhibition: increased self-awareness in the face of an aversive emotional experience or escape from the negative emotional experience through a different avenue than eating. If chronic dieters escape the aversive emotional experience through writing about a non-emotional topic like a description of the room, then there is no need to escape the aversive emotional experience through eating as well. On the other hand chronic dieters who write with a high degree of self-awareness are able to maintain dietary inhibition despite

experiencing an aversive emotional experience because chronic dieters who remain aware of complex levels of thought including a focus on future goals (Heatherton & Baumeister, 1991). Chronic dieter's future goals include weight loss through dietary restriction.

Chronic dieters are characterized by their struggle with their weight and the ability to maintain control over their eating impulses. Expressive writing for twenty minutes about a topic that induces high self-awareness may be one tool they can utilize in gaining more control over dietary inhibition. While expressive writing appears to be a promising technique for chronic dieters to engage in, there are limitations of the current study to consider.

Limitations of Study

One limitation of the present study is that it was the first to operationally define self-awareness using linguistic markers. The lack of observed differences in self-awareness between chronic dieters and non-dieters may be due to the fact that the linguistic markers may not have adequately represented self-awareness. The text analysis software package used in this study to assess self-awareness provided counts of words that I decided represented self-awareness. Self-awareness in a precise moment is difficult to measure and few others have done so. Heatherton (1993) used a sentence completion task to measure self-focus. He had participants complete the sentence, "I am ..." 30 times (Heatherton, 1993). Raters then coded the responses as other focused, self-focused, or neutral. Heatherton's (1993) methods for measuring self-focus were similar to the methods of the current study for measuring self-awareness because both involved

participants' providing their own verbal descriptions of themselves and both involved scoring methods based on the types of words the participants used in their responses. The fact that similar methods were used in at least one other study indicates that using linguistic markers of self-awareness has face validity. But, because the current study may have been the first to measure self-awareness using linguistic markers of self-awareness from written text and because no other measures were obtained to establish validity, the operational definition of self-awareness as a composite of linguistic markers should be assessed in greater detail in future studies.

One of the key findings of the current study was that chronic dieters demonstrated an ability and willingness to write with a similar degree of self-awareness as non-dieters. This was a surprising finding because chronic dieters have a tendency to escape aversive emotional experiences, but it is also promising because self-awareness is desirable for chronic dieters to maintain dietary inhibition. One explanation for the fact that chronic dieters in the current study demonstrated an ability to write with as much self-awareness as non-dieters following a failure task may be that participants may have felt more motivated to comply with the writing instructions to make up for their poor performance on the initial failure task. Dixon and Baumeister (1991) demonstrated that individuals who perform poorly on a failure task tend to strive to improve their performance on a subsequent task to make up for their initial failure. In the current study, participants may have been motivated to comply with the instructions they were given for the writing task because they felt badly about being unable to complete the puzzle. Without the guilt for having failed the puzzle task and potentially ruining my study, chronic dieters may be less inclined to write with the same degree of self-awareness as non-dieters.

A third limitation to consider is that although the failure task used in this particular study has been used in previous studies with desired ego threatening effects (Heatherton et al., 1993) it may have been slightly unreliable. Lattimore (2001) criticized methods that involve a failure task to induce negative mood and lowered state self-esteem because she reported these methods are challenging to replicate because they involve bias. It is unknown whether the failure task was strong enough or qualitatively similar enough to other studies that have demonstrated a relationship between disinhibited eating and failure tasks among chronic dieters. But participants' survey responses completed immediately following the failure task demonstrated that participants indeed felt worse about themselves following the puzzle task.

Also, the lack of group differences found between the groups on cookie consumption in response to the ego threatening event used here (i.e., failure task) may not generalize to other types of ego threatening events. Although all ego threatening events share decreased mood and state self-esteem by definition, not all ego threatening events lead to these outcomes in quite the same way. For example, women's self-esteem tends to be more invested with their social appearance while men's self-esteem tends to be more invested in their performance on tasks. In the current study with a sample of women, a failure task was used as the ego threatening event and no group differences were found on disinhibited eating following the event. These results may not generalize in the same way to women who experience an ego threatening event that is social in nature.

The environment in which the participants were presented the cookies, may not have been the most conducive to elicit disinhibited eating. Those who struggle with disinhibited eating often do so in private and a great deal of shame surrounds their eating

habits. Although, participants in the current study were given privacy when they were left with the cookies to taste test, it was still an unfamiliar room with noise from passers by in the hallway and the uncertainty of knowing when exactly I would re-enter the room. These variables are small, but taken together may have altered the eating experience just enough to allow for questioning of the degree to which the results can be generalized.

Finally, it was assumed for this study, that self-awareness is a state of focus on the self, but it is possible that self-awareness is a trait which means it can't be altered in the moment by an intervention that leads to focusing on the self. It is possible that self-awareness requires practice to learn this way of looking at oneself. And finally, self-awareness may fall on a continuum with both too little and too much being maladaptive for self-regulation. If self-awareness is a trait and each individual falls somewhere on a continuum of self-awareness, then the expressive writing intervention used in this study would not have been appropriate as self-awareness would not be something that could be elicited or directed. Instead, a measure of self-awareness could be provided and participants could be grouped into varying degrees of self-awareness based on their scores to this questionnaire.

Although the present study has limitations, these limitations do not invalidate the findings of the current study. Instead these limitations provide questions that future research can explore. The implications for future research will be discussed in greater detail in the following section.

Implications for Future Research

Future research should continue to explore the uses of high self-aware and low-self-aware tasks such as expressive writing. Unlike the current study, studies using a distraction or low self-awareness task in the form of a video clip have not led to dietary restraint for chronic dieters in the past. This may be because the methods for distraction in other studies did not facilitate escape from aversive emotions and the methods in the current study may have provided a means for escape. Researchers of future studies should thoroughly explore the types of low self-awareness tasks that may lead to dietary inhibition among chronic dieters (Heatherton et al., 1993). Future research should aim to decipher which distraction/low self-awareness tasks lead to increased dietary restraint and decreased dietary restraint. Researchers should consider the qualities that make eating an effective escape from self-awareness and confirm whether writing is in fact an effective substitute for eating.

Since very little is known about the reasons for the effectiveness of expressive writing, future research should continue to examine this. The current study suggests that immediately following a writing task, chronic dieters have the ability to maintain restraint in eating. This suggests that expressive writing may have benefits immediately following the task. Most other expressive writing research examines outcomes of expressive writing weeks and months following a writing regimen that consists of writing for a specified amount of time over the course or a specified number of consecutive days. More research should examine the benefits of expressive writing immediately following the task.

More research is needed to validate that the linguistic markers used in this study to define self-awareness are in fact valid measures of self-awareness. In the current study, the linguistic markers that were used to represent self-awareness were first person

pronouns, negative emotion words, positive emotion words, cognitive mechanism words, and present tense verbs. These linguistic markers were chosen to represent self-awareness because participants were asked to be aware of and write about their own thoughts and feelings in the present moment. Researchers could validate these linguistic markers from written text samples by demonstrating that the linguistic markers are highly correlated with another measure of self-awareness, which has already been shown to be psychometrically valid and reliable. If these linguistic markers from written text samples prove to be a valid means for measuring self-awareness, the uses for expressive writing as a self-awareness enhancer or a distraction/escape from self-awareness may extend beyond the chronic dieter population. This is important because self-awareness is thought to be necessary in all behaviors that require self-control and self-regulation (Heatherton & Vohs, 1998). Individuals who struggle to self-regulate other behaviors such as decreasing alcohol consumption, smoking, or sedentariness may also be able to benefit from expressive writing about high and low self-awareness topics.

In the current study a failure task was used as an ego threatening event. Other types of ego threatening events that researchers have used include social rejection, movie clips, and music (Schotte, 1992). Variations of this study with a variety of ego threatening events should be done to confirm that the results found in this study would generalize to other types of ego threatening events not only failure tasks.

This study used a sample of college women, so replicating this study with samples from a variety of other populations such as men and a variety of ethnic, racial, and age groups may provide different results. The differences in the outcomes for studies done on

a variety of other populations may add to our ability to explain the results to this study further.

Chronic dieters and individuals with avoidant coping styles both have a tendency to escape awareness of negative emotional experiences. But self-awareness rather than escape has been shown to help individuals self-regulate their behaviors including dietary inhibition. Evidence in the current study indicates expressive writing was an effective way of manipulating self-awareness despite the tendency chronic dieters have to avoid self-awareness during an aversive emotional experience. Future research should explore the use of expressive writing about high self-awareness topics with individuals with avoidant coping styles to determine if it has any benefits for them as well.

Finally, much of the research in the area of chronic dieting, restraint theory, and escape theory has been conducted by social psychology departments in highly controlled laboratory settings (e.g., Heatherton et al., 1993; Polivy et al., 1994). While this format provides a wealth of information about eating behavior and how it relates to various controlled conditions, these types of studies do not usually involve the testing of techniques that could be used by practitioners working with chronic dieters to help them manage their weight and eating behaviors. What we know from this line of research could be very valuable to practitioners treating chronic dieters, but researchers interested in applied psychology research need to find ways of incorporating what we know into effective treatment approaches. Obesity continues to increase and remain a health threat in our society. Future research in this area should broaden to continue to investigate practical techniques and further implications for clinical practice in treating those who

struggle with overeating and obesity. The implications that the current study has for practice will be discussed at greater length in the next section.

Implications for Practice

This study indicated that expressive writing may be useful in creating a high or low-self awareness state depending on the writing topic used among chronic dieters. The benefits to using expressive writing for altering self-awareness are that it is a cost effective and convenient technique that the majority of the population can utilize. It is an engaging exercise that requires focused attention on a task while still being convenient in that it can be done in almost any setting. Other methods that have been used to increase self-awareness such as reviewing a video tape of oneself (Heatherton et al., 1993) or looking at oneself in a mirror (Baumeister et. al., 2005) are not practical in most situations. Those desiring to enhance self-awareness or escape self-awareness in an effort to improve self-regulation during an aversive emotional experience can easily practice expressive writing whether at home, school, work, etc.

Expressive writing could be used in conjunction with group or individual therapy in a number of ways. Individuals who go for treatment could be given homework assignments where they write after experiencing an ego threatening event (once they learn how to recognize ego threatening events) or individuals in treatment could be asked to write during individual or group psychotherapy sessions to practice the experience in the presence of a professional. The writing samples could be read together with the

therapist to facilitate discussion or they could be kept private by the individual, so that they feel comfortable pouring out their emotions into the writing assignment.

Chronic dieters do not have a tendency to voluntarily remain highly self-aware following an ego threatening event, but the fact that the writing samples from chronic dieters who had experienced an ego threatening event were as self-aware as non-dieters who had experienced an ego threatening event in the current study is promising. If given specific instructions about being self-aware, they are just as able and willing to do so as non-dieters. In general dietary inhibition is a type of self-regulation (Baumeister & Heatherton, 1996). Self-regulation involves thoughtful and effortful control over one's behaviors in a way that impulses are overridden. Behaviors one may wish to self-regulate include impulses for criminal behavior, smoking, sexual behaviors, drug abuse, and spending money (Baumeister & Heatherton, 1996). Increased self-awareness aids in self-regulation beyond eating inhibition (Baumeister & Heatherton, 1996), so there are possibilities of using expressive writing in helping people self-regulate in a number of areas.

Results from this study show that expressive writing may be a means by which chronic dieters can escape aversive emotional experiences. Having another means to escape an emotional experience besides eating may be desirable for chronic dieters who are not willing to engage in emotional expression of painful emotions because it allows them to simultaneously escape the aversive emotional experience without overeating.

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APPENDICES

Appendix A

Script for Experimentrix (recruitment)

“I am looking for female college students who are at least 18 years old to participate for approximately 45-minutes to one hour in a research study. The purpose of this study is to determine the relationship between cognitive processes, moods and sensory perceptions. Participation may include completing some questionnaires and watching a video, or completing questionnaires, participating in two tasks to assess cognitive processes, and participating in one of five tasks to assess sensory perception. Your participation is voluntary and you would have the right to withdraw your consent at any time. The benefits include a better understanding of your own thoughts, feelings, and behaviors, and the risk includes possible uncomfortable feelings. You would receive one research credit for your participation. If you are interested, please select an appointment time, and please refrain from eating or drinking anything except water for 2-3 hours prior to your appointment.”

Appendix B

Writing Condition Instructions Participants Will Be Given

Task failure participants will be randomly assigned to write about one of the following topics:

A) Take a moment to think about your feelings about yourself in this moment. How do you feel about yourself? Take some time to let these emotions emerge and experience those feelings mentally and physically. Determine the thoughts about yourself associated with those emotions. For the next twenty minutes, please write about these feelings and thoughts about yourself as deeply and expressively as you can. Please write honestly and openly for the entire time without stopping.

B) For the next twenty minutes I would like you to describe the room that you are sitting in with as much detail as you can. The important thing is to write only a description about the room without stopping for the entire time.

Appendix C

Taste Test

Please taste each of the three types of cookies that have been placed in front of you. Answer the following questions as honestly as you possible can. Feel free to try as many cookies as you need to be able to provide accurate answers.

1) Which of the cookies do you most prefer in general? (Check one)

_____ Cookie A _____ Cookie B _____ Cookie C

2) Which of the cookies do you think is the sweetest? (Check one)

_____ Cookie A _____ Cookie B _____ Cookie C

3) Which of the cookies do you think is the blandest? (Check one)

_____ Cookie A _____ Cookie B _____ Cookie C

4) Which of the cookies do you think is the saltiest? (Check one)

_____ Cookie A _____ Cookie B _____ Cookie C

5) Which part of your tongue is the flavor of cookie A strongest? (Check one)

_____ The tip
_____ The middle
_____ The sides
_____ The back

6) Which part of your tongue is the flavor of cookie B strongest? (Check one)

_____ The tip
_____ The middle
_____ The sides
_____ The back

7) Which part of your tongue is the flavor of cookie C strongest? (Check one)

_____ The tip
_____ The middle
_____ The sides
_____ The back

Appendix D

Resource List

This is a list of some centers that provide counseling services to college students.

Counseling Psychology Clinic
408 Willard Hall
Oklahoma State University
Stillwater, OK 74078
(405) 744-6980

University Counseling Services
316 Student Union
(405) 744-5472
002 Student Health
(405) 744-7007

Reading and Math Center (counseling services are available here)
102 Willard Hall
Oklahoma State University
Stillwater, OK 74078
(405) 744-7119

Psychological Services Center
118 North Murray Hall
Oklahoma State University
Stillwater, OK 74078
(405) 744-5975

Appendix E

Script for Failure Task Experiment

Materials needed for experiment:

- Informed consent forms (one for them to keep and one to sign and give to researcher).
- Spin Out game.
- Stopwatch
- Pens/pencils
- Sheets of paper for expressive writing section
- Box with envelopes of other writing samples
- Blank empty envelope to seal participant writing sample in.
- Demographic sheet, MRS (2 copies), SSES (2 copies), RRS, taste testing form, and the cookie consumption recording form.
- 3 plates of 3 types of cookies (store bought).
- Lists of ingredients for each of the three types of cookies. This will not be available to the participant, but if they admit to having a food allergy then this list can be consulted to determine if any of the cookies actually have that particular ingredient.
- Napkins.
- Small plastic cup of water.
- Scale to weigh cookies.
- Debriefing questions.
- Resource list.

Initiation of study and informed consent:

Hi, my name is _____, and I will be working with you today for approximately the next hour. The first thing I need to do is obtain informed consent from you. I am going to read this form out loud. Please follow along on your own copy (*read over the informed consent form. When they sign it, take the signed copy for yourself and inform them that they can keep the copy you gave them to read along with*). Thank you for agreeing to participate in this study. This copy is for you to keep.

Failure task:

The first task I am going to ask you to complete is a cognitive abilities task (*place the puzzle in front of the participant*). As you can see, I have given you a puzzle (*Spin Out*) that requires a type of cognitive process called binary logic. The goal is to slide these pieces (*show them the two pieces*) out of the bar (*brief partial demonstration*). Most adults of average intelligence have no problem solving it in about three to five minutes, so what I will be looking at is the speed with which you solve the puzzle and the method with which you solve it (*pull out the stop watch*). When I say “Go” begin. Do you have any questions? (*if they say “no” then continue, and if they say yes, ask what the question is and answer it as best you can*). Ok then, “Go” (*begin the stop watch. Watch the participant intently as she attempts to complete the test. Pretend to write observations down on a notepad as she works. After about four minutes, look up and say...*) You have one more minute. (*After five minutes, stop the stop watch.*). Ok, please put the puzzle down and stop. (*Clear the puzzle and stopwatch away*).

Mood and Self-esteem measures:

As I mentioned earlier, the purpose of this study is to examine the relationship between cognitive processes, moods, and sensory perceptions. To assess your moods and thoughts, I would like you to complete these two questionnaires (*place the SSES and the MRS in front of them with a pen. When they complete them continue...*). Thank you for filling those out.

Writing task:

Next, I am going to ask you to participate in one more task to assess your cognitive processes. (*Take out blank lined paper with pens and a slip of paper that has the writing instructions on it*). I am going to ask you to write for twenty minutes without stopping about the topic written on this piece of paper. It is important that you follow the instructions by writing for the entire twenty minutes and by writing only about the topic on this piece of paper.

You should know that when you finish with your writing sample, I am going to ask you to place it in a sealed envelope that will be placed in a box with several other sealed envelopes of writing samples to insure your anonymity. Please don't write your name on your writing sample and please write as openly and honestly as you can. After the data collection portion of the study is complete, the writing samples will be analyzed with a text analysis software program to assess cognitive processes. Do you have any questions? (*answer questions they may have*). Do you need to use the restroom or take a break for any reason? (*allow them a short break if they need it*). Ok, begin. I will leave you alone and be back in twenty minutes.

(*Return after twenty minutes with a large box with several blank sealed envelopes*). Ok, times up. Thank you for participating in this task for me. Here is the

blank envelope (*hand participant the envelope*). Please fold your writing sample, place it in the envelope, seal the envelope, and mix the envelope into this box with the other ones.

Thank you.

Taste Test

At the beginning of today's session you were told that part of the purpose of this study is to assess sensory perception. Of the five sensory conditions available, you have been randomly assigned to participate in the taste perception task (*take out three plates of cookies, a glass of water, and the taste rating sheet with a pen*). As you can see there are three different plates of cookies labeled A, B, and C. I am going to ask you to try each of the three types of cookies and complete the form you have in front of you. Before we begin, I want to ask you if you have any food allergies. (*if they report that they do, then ask what it is and compare that to the list of ingredients in each of the three types of cookies. If one of the types of cookies has that particular allergen, then eliminate that plate of cookies from their taste testing options. If they are diabetic or allergic to wheat or some other ingredient in ALL three cookies then discontinue with this portion of the study and move on to the next portion. Be sure to report any of these situations in the comments section of the cookie consumption form*). The goal is to complete that form as accurately and honestly as possible, so feel free to try as many cookies as you need to do that. I am going to leave you alone for a few minutes to complete this task while I gather the materials for the next portion of the study. If you finish before I get back just wait here for a few minutes. Do you have any questions before I go? (*answer questions*).

(*Return after 5 minutes*). Ok have you finished with the taste rating form? Thank you very much for that. (*collect the taste testing sheet, and cookies*).

MRS, SSES, RRS, and demographic sheet

I am going to ask you to fill out some more questionnaires before we finish up for today. Please take a few moments to honestly answer the questions in these questionnaires and remember not to write your name on them. (*clean up and wait for them to finish*). Great, thank you for filling those out.

Interview questions

The last thing I am going to ask you to do today is to answer some questions for me, ok?

1. What do you think the purpose of this study was?
2. Did you question at any point during the study whether “assessing cognitive processes, moods, and sensory perceptions” was really the purpose?
 - a. If yes, then what did you think the real purpose was.
 - b. If yes, what parts of the study made you question that?
3. On a scale from 1 – 10 how did you feel before the puzzle task?

1=great and 10=awful.
4. On a scale from 1-10 how did you feel after completing the puzzle task?

1=great and 10=awful.
5. Do you think the way you felt after the puzzle task affected how much of the cookies you ate? Yes or No.
 - a. If yes, then how?
6. Do you perceive cookies as healthy? Yes or No
7. Do you perceive eating cookies as an enjoyable activity? Yes or No
8. Are cookies a food you would normally try to restrict from your diet? Yes or No

9. On a scale from 1 to 10, how much restraint did you practice when taste testing the cookies?

1= Extreme restraint, "I wanted more cookies, but forced myself to not eat more than I did"

10= No restraint at all, "I ate as many cookies as I wanted to."

10. Do you diet to watch your weight?

a. If yes, then did eating the cookies violate your diet?

11. On a scale from 1 to 5 how important did you find the writing task?

1=not at all and 5=extremely

12. On a scale from 1 to 5 how difficult did you find the writing task?

1=not at all and 5=extremely

13. On a scale from 1 to 5 how disturbing did you find the writing task?

1=not at all and 5=extremely

14. On a scale from 1 to 5 how challenging did you find the writing task?

1=not at all and 5=extremely

Debriefing

Thank you for answering those questions for me. Your participation today is greatly appreciated. Before you leave I need to inform you of the true nature of this study. You were told at the beginning of today's session that the purpose of the study was to explore the relationship between cognitive processes, moods, and sensory perceptions. However, the real purpose of the study was to assess expressive writing's effects on food consumption following a failure task.

This means the puzzle task you participated in was designed for failure. It was a very difficult task to complete successfully in the amount of time I gave you. That task was designed to make you believe you failed a simple task.

Also, the taste perception task was designed to assess eating behaviors not sensory perceptions. You were not randomly assigned to the taste perception task, as all participants are asked to taste test the cookies for the purposes of assessing eating behavior following an expressive writing task and a failure task.

Finally, the writing task was designed to assess cognitive processes, but it was also supposed to serve as an intervention. It is believed that increasing self-awareness through writing would decrease cookie consumption. This is one of the hypotheses of this study.

I am sure that you have questions about all this, and I will encourage you to ask them in a moment. I want you to feel like you have an adequate understanding of the events of today's experiment. I first want to reiterate how much I appreciate your participation. I know this was probably very stressful for you and I feel very badly that this is how we have to conduct these types of experiments. It was necessary to deceive you for this experiment because I am trying to examine the relationship between negative mood and lowered self-esteem with eating behaviors. In order to examine that relationship it was necessary to insure that for the duration of this experiment, participants were in a state of negative mood and lowered self-esteem. Unfortunately simply telling participants to feel negatively is not effective. Unfortunately using a fake failure task is one of the most powerful methods for studying negative emotion. Thank

you for your contribution to this research and for withstanding the distress placed on you during this last hour. I apologize for that.

Your assignment to these tasks was purely a function of the time slot you signed up for. It was not personal and there was no identifying quality about you that made me select you in particular for this experiment. Also know that there are many other participants in this study and your responses and behaviors were completely normal.

Keep in mind all the information gathered from this experiment has no identifying information on it. The data you provided will not be linked with your name. The only item we have with your name on it is your informed consent signature and that form will be stored in a different location than the other pieces of data you provided. You also have the right to withdraw your data from inclusion in the study without penalty and without losing the one point of research credit you will get for participating in today's experiment.

The information gleaned from this study may provide valuable information that could contribute to further research and interventions for those who struggle with overeating. As you may know, obesity is a big problem in our country and many individuals suffer emotionally and physically as a result. Many individuals who overeat feel they can't control their eating especially when they feel bad emotionally. The despair and feelings of helplessness they feel as a result of being vulnerable to overeating can affect their overall emotional state, social life, and general quality of life. This study's purpose is to better understand emotional eating as well as suggesting a potential intervention, which may allow these individuals who struggle with overeating to take

more control of their eating and their health. Thank you for spending an hour with me today providing valuable data for this study.

So, do you have any questions or concerns?

How are you feeling about participating in this study today? (*take a few moments to allow them to talk about their feelings*). I am going to give you this resource list to take with you, and I would encourage you to seek further assistance if you feel you may need it.

Again, thank you for your participation today. The research you have contributed to today may be published in the future. It is important that the data collected throughout the rest of the data collection process remain of the highest quality. Because of that it is important that future participants remain unaware of the true purpose of the study and the conditions until they have completed all the tasks. As you can imagine this is an important part of maintaining the integrity of the research findings in this study, so it is important that all participants refrain from discussing the details of the study with their peers. The results of the study will be available within the next year. If you contact me or my advisor, who are both listed on the consent form, by email or phone, either of us would be happy to provide you with a summary of the findings.

Appendix F

Demographic Information

Directions: Please answer each question by filling in the blank, checking the blank, or circling the letter or number that best describes you.

1) Age _____

2) Race: (check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> a) African American/Black | <input type="checkbox"/> d) Caucasian/White |
| <input type="checkbox"/> b) American Indian/Native American | <input type="checkbox"/> c) Asian/Asian American |
| <input type="checkbox"/> f) Other: _____ | |

3) Ethnic category:

- | | |
|---|---|
| <input type="checkbox"/> a) Hispanic/Latino/a | <input type="checkbox"/> b) Not Hispanic/Latino/a |
| <input type="checkbox"/> c) Other | |

3) Are you:

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> a) Single (No relationship) | <input type="checkbox"/> e) Separated |
| <input type="checkbox"/> b) Partnered (living with partner) | <input type="checkbox"/> f) Divorced |
| <input type="checkbox"/> c) Partnered (not living with partner) | <input type="checkbox"/> g) Widowed |
| <input type="checkbox"/> d) Married | |

8) Height: _____ feet _____ inches Weight: _____ pounds

9) Number of hours of exercise you engage in per week? _____

10) If you are dependent on your parents, what is your parent's income? But, if you are financially independent, what is your personal family income?

- | | |
|---|--|
| <input type="checkbox"/> a) Less than \$10,000/year | <input type="checkbox"/> f) \$30,000 – 40,000/year |
| <input type="checkbox"/> b) \$10,000 – 15,000/year | <input type="checkbox"/> g) \$40,000 – 50,000/year |
| <input type="checkbox"/> c) \$15,000 – 20,000/year | <input type="checkbox"/> h) \$50,000 – 60,000/year |
| <input type="checkbox"/> d) \$20,000 – 25,000/year | <input type="checkbox"/> i) \$60,000 – 70,000/year |
| <input type="checkbox"/> e) \$25,000 – 30,000/year | <input type="checkbox"/> j) Greater than \$70,000/year |

11) What is your major? _____

12) Where do you live? (Check one)

- | | |
|---|-----------------------------------|
| <input type="checkbox"/> Dormitory/Residence Hall | <input type="checkbox"/> Sorority |
| <input type="checkbox"/> Off campus | |

13) What year are you?

Freshman

Sophomore

Junior

Senior

Graduate student

Other: _____

Appendix G

Revised Restraint Scale

The following questions refer to your normal eating pattern and weight fluctuations. Please answer accordingly.

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

Never Rarely Sometimes Usually Always

2. What is the maximum amount of weight (in pounds) you have ever lost in one month? (Circle One)

0-4 5-9 10-14 15-19 20+

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

0-1 1.1-2 2.1-3 3.1-5 5.1+

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

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? (Circle one)

Not at all Slightly Moderately Very Much

6. Do you eat sensibly in front of others and splurge alone? (Circle one)

Never Rarely Often Always

7. Do you give too much time and thought to food? (Circle one)

Never Rarely Often Always

8. Do you have feelings of guilt over overeating? (Circle one)

Never Rarely Often Always

9. How conscious are you of what you're eating? (Circle one)

Not at all Slightly Moderately Very Much

10. How many pounds over your desired weight were you at your maximum weight?

0-1 1-5 6-10 11-20 21+

Appendix H

State Self Esteem Scale

This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these questions as they are true for you RIGHT NOW.

	Not at All	A Little Bit	Somewhat	Very Much	Extremely
1. I feel confident about my abilities.					
2. I am worried about whether I am regarded as a success or failure.					
3. I feel satisfied with the way my body looks right now.					
4. I feel frustrated or rattled about my performance.					
5. I feel that I am having trouble understanding things that I read.					
6. I feel that others respect and admire me.					
7. I am dissatisfied with my weight.					
8. I feel self-conscious.					
9. I feel as smart as others.					
10. I feel displeased with myself.					
11. I feel good about myself.					
12. I am pleased with my appearance right now.					
13. I am worried about what other people think of me.					
14. I feel confident that I understand things.					
15. I feel inferior to others at this moment.					
16. I feel unattractive.					
17. I feel concerned about the impression I am making.					
18. I feel that I have less scholastic ability right now than others.					
19. I feel like I'm not doing well.					
20. I am worried about looking foolish.					

Appendix I

Mood Rating Scale

Indicate the degree to which each of the following items describes your **CURRENT MOOD**.

Not at All			Very Much			
1	2	3	Happy	4	5	6
1	2	3	Depressed/Blue	4	5	6
1	2	3	Pleased	4	5	6
1	2	3	Bored	4	5	6
1	2	3	Self-confident	4	5	6
1	2	3	Worried	4	5	6
1	2	3	Enjoyment/Fun	4	5	6
1	2	3	Tired	4	5	6
1	2	3	Joyful	4	5	6
1	2	3	Frustrated	4	5	6
1	2	3	Aroused/Active	4	5	6
1	2	3	Unhappy	4	5	6
1	2	3	Anticipating	4	5	6
1	2	3	Excited	4	5	6
1	2	3	Angry/Hostile	4	5	6

1	2	Sociable/Friendly	4	5	6
---	---	-------------------	---	---	---

1	2	Satisfied	4	5	6
---	---	-----------	---	---	---

Appendix J

Food Consumption Recording Sheet

Date: _____ ID #: _____

Weight of Cookies before taste testing (gms): _____

Weight of Cookies after taste testing (gms): _____

Total amount of cookies eaten (gms): _____

Comments:

Appendix K

Informed Consent

(Non-Task Failure Participants)

- Purpose:** The purpose of the study is to determine the relationship between cognitive processes, moods and sensory perceptions.
- Procedures:** Participation in this study will involve completing three questionnaires, one of which is a demographic sheet and watching a video about cognitive sensory processes. It is called Cognitive Neuroscience and is from the Discovery Psychology series. It will take you approximately 45 minutes to complete the questionnaires and watch the video.
- Risks of Participation:** The potential risks you may encounter are minimal and may include uncomfortable emotions. You will receive a resource list at the end of today's experiment, so if you feel you need any additional support you may contact one of the agencies listed. Also, you have the right to withdraw from the study at any time without penalty.
- Benefits:** The potential benefit of participating in this study is an increased awareness of your own thoughts, feelings, and behaviors as well as benefits for the research and mental health community.
- Confidentiality:** All information collected in this study is strictly confidential. Data will be stored in a locked file cabinet that only the researcher and her advisor will have access to. The data will be kept for three years. No individual participants will be identified. Your instructor will not know what your individual responses were or what your written text will say. However, we will report via the Experimetrix database system that you participated in the study by providing you with one unit of course credit. The OSU IRB has the authority to inspect consent records and data files to assure compliance with approved procedures.
- Compensation:** You will receive one unit of course credit (via the Experimetrix system) for participating in the 45-minute session. You have the right to withdraw consent to participate at any point during data collection without losing the one unit of course credit you are receiving for your participation. If you are unable to participate, ineligible, or are not interested in participating, you can attend one Undergraduate Research Colloquia or write a 3-4 page paper on a designated topic as agreed upon by your instructor to earn the equivalent credit (or "units").
- Participant Rights:** Participation in this study is completely voluntary. Your decision, whether

to participate or not, will not adversely affect you in any way. There is no penalty for not participating and you have the right to withdraw your consent, data, or participation at any time.

Contacts: If you have any questions concerning this study, please feel free to contact Tracey Ledoux, MS, (405) 762-9039 or Steve Harrist, PhD (405) 744-4837. For information on subjects' rights, contact Dr. Sue Jacobs, IRB Chair, 415 Whitehurst Hall, 405-744-1676.

Your participation is greatly appreciated. Please let me know if you have any questions. If you agree to participate, please sign and date below.

I (the participant) have read and fully understand the consent form. I sign it freely and voluntarily. A copy of this form has been given to me.

Signature of Participants : _____ Date: _____

I (the researcher) certify that I have personally explained this document before requesting that the participant sign it.

Signature of Researcher: _____ Date: _____

Appendix L

Informed Consent

(Task Failure Participants)

- Purpose:** The purpose of the study is to determine the relationship between cognitive processes, moods and sensory perceptions.
- Procedures:** Participation in this study will involve completing a cognitive processing task, completing questionnaires, participating in a writing task, participating in one of five sensory perception tasks, and a short interview. The writing task will consist of writing for 20 minutes about a randomly assigned writing topic. Writing samples will be later analyzed with a text analysis software package for cognitive processes information. The sensory perception task will involve answering questions related to a task involving one of the following: olfactory sensation (smell), taste sensation, auditory sensation (listening), visual sensation, or a tactile sensation (touch) task. If you are assigned to the taste perception task, please inform me if you have any food allergies when we get to that portion of the experiment. The interview will involve answering questions about your experience during each task. This session will take approximately 45-60 minutes.
- Risks of Participation:** The potential risks you may encounter are minimal. Some of the tasks may be challenging and some of the tasks may be emotionally uncomfortable. You will receive a resource list at the end of today's experiment, so if you feel you need any additional support you may contact one of the agencies listed. Also, you have the right to withdraw from the study at any time.
- Benefits:** The potential benefit of participating in this study is an increased awareness of your own thoughts, feelings, and behaviors as well as benefits for the research and mental health community.
- Confidentiality:** All information collected in this study is strictly confidential. Data will be stored in a locked file cabinet that only the researcher and her advisor will have access to. The data will be kept for three years. No individual participants will be identified. Your instructor will not know what your individual responses were or what your written text said. However, we will report via the Experimetrix database system that you participated in the study by providing you with one unit of course credit. The OSU IRB has the authority to inspect consent records and data files to assure compliance with approved procedures.
- Compensation:** You will receive one unit of course credit (via the Experimetrix system) for participating in the 45-minute session. You have the right to withdraw consent to participate at any point during data collection without losing the

one unit of course credit you are receiving for your participation. If you are unable to participate, ineligible, or are not interested in participating, you can attend one Undergraduate Research Colloquia or write a 3-4 page paper on a designated topic as agreed upon by your instructor to earn the equivalent credit (or “units”).

Participant

Rights: Participation in this study is completely voluntary. Your decision, whether to participate or not, will not adversely affect you in any way. There is no penalty for not participating and you have the right to withdraw your consent, data, or participation at any time.

Contacts: If you have any questions concerning this study, please feel free to contact Tracey Ledoux, MS, (405) 762-9039 or Steve Harrist, PhD (405) 744-4837. For information on subjects’ rights, contact Dr. Sue Jacobs, IRB Chair, 415 Whitehurst Hall, 405-744-1676.

Your participation is greatly appreciated. Please let me know if you have any questions. If you agree to participate, please sign and date below.

I (the participant) have read and fully understand the consent form. I sign it freely and voluntarily. A copy of this form has been given to me.

Signature of Participants : _____ Date: _____

I (the researcher) certify that I have personally explained this document before requesting that the participant sign it.

Signature of Researcher: _____ Date: _____

Appendix M

Table 1

Means and standard deviations for the manipulation check after the failure task.

Variable	Group			
	Failure Task Group		Non-Failure Task Group	
	M	SD	M	SD
State Self-esteem	68.34	12.189	71.38	13.868
Positive emotion	13.99	4.081	16.06	3.708
Negative emotion	12.15	4.483	11.21	4.889

Table 2

Mean usage rates of linguistic markers in each writing condition.

Variable	Group			
	High Self-Awareness Group		Low Self-Awareness Group	
	M	SD	M	SD
“I”	14.5003	2.61581	1.5527	1.4458
Cognitive mechanism	8.1494	2.39280	2.5894	1.36577
Present tense verbs	15.5053	2.77358	11.0376	2.05659
Positive emotion	3.3421	1.37690	1.3627	.80375
Negative emotion	2.6885	.95268	.4488	.57302

Table 3

Analysis of covariance for grams of cookies consumed.

Source	SS	F	p-value
Diet Status (DS)	473.455	2.177	.145
Writing Topic (WT)	41.213	.190	.665
DS X WT	284.106	1.307	.257

Table 4

Mean linguistic marker usage for chronic dieters and non-dieters.

Variable	Group			
	Chronic dieter Group		Non-dieter Group	
	M	SD	M	SD
“I”	9.5914	6.70162	7.0690	6.85104
Cognitive mechanism	6.3450	3.49824	4.7403	3.21973
Present tense verbs	13.6661	3.59145	13.0454	3.11589
Positive emotion	2.7754	1.59525	2.0741	1.37762
Negative emotion	1.9604	1.32916	1.3162	1.35725

Table 5

2 X 2 MANCOVA on state self-esteem, negative emotion, and positive emotion scores.

Source	Wilk's Lambda	df	F	p-value
Diet Status (DS)	.870	3	2.901	.080
Writing Topic (WT)	.907	3	1.986	.126
DS X WT	.929	3	1.477	.230

Table 6

Univariate analyses for positive emotion, negative emotion, and state self-esteem.

Group	Dependent variables					
	State self-esteem		Negative mood		Positive mood	
	F	p-value	F	p-value	F	p-value
Diet State (DS)	.136	.714	4.569	.037*	3.955	.051
Writing Topic (WT)	4.328	.042*	2.334	.132	.813	.371
DS X WT	.157	.693	5.336	.024*	.161	.689

*p < .05.

Oklahoma State University Institutional Review Board

Date: Friday, October 07, 2005
IRB Application No ED0623
Proposal Title: Expressive Writing's Effects on Eating Following Negative Mood and Lowered Self-esteem Onset
Reviewed and Processed as: Full Board

Status Recommended by Reviewer(s): Approved Protocol Expires: 9/25/2006

Principal Investigator(s)

Tracey Ledoux
434 Willard
Stillwater, OK 74078

Steven Harrist
434 Willard
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 4: CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 415 Whitehurst (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Sue C. Jacobs, Chair
Institutional Review Board

VITA

Tracey Ledoux

Candidate for the Degree of

Doctor of Philosophy

Thesis: EXPRESSIVE WRITING'S EFFECTS ON DISINHIBITED EATING
FOLLOWING AN EGO THREATENING EVENT

Major Field: Educational Psychology

Biographical:

Education: Graduated from North Smithfield High School, North Smithfield, Rhode Island in June 1993; received a Bachelor of Science degree in Human Nutrition from the University of Massachusetts, Amherst, Massachusetts in December, 1997; received a Master of Science degree in Clinical Nutrition from the University of Memphis, Memphis, Tennessee in May, 2000; received a Master of Science degree in Community Counseling from the University of Memphis, Memphis, Tennessee in August, 2003. Completed the requirements for the Doctor of Philosophy in Educational Psychology with an emphasis in Counseling Psychology, at Oklahoma State University in July, 2007.

Experience: Intern, Michael E. DeBakey Veterans Affairs Medical Center, Houston, Texas, 2006-2007; Project Coordinator, Oklahoma State University, Stillwater, Oklahoma 2005-2006; Instructor, Oklahoma State University, Stillwater Oklahoma, 2003-2005; Clinical Nutrition Manager, Delta Medical Center, Memphis, Tennessee, 2000-2003; Nutrition and Research Assistant, St. Jude Children's Research Hospital, Memphis, Tennessee, 1998-2000; Dietary Technician, Roger Williams Hospital, Providence, Rhode Island, 1996-1998.

Professional Memberships: American Psychological Association, Oklahoma Psychological Association, Association of Psychologists in Academic Health Centers.

Name: Tracey Ledoux

Date of Degree: July, 2007

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: EXPRESSIVE WRITING'S EFFECT ON DISINHIBITED EATING
FOLLOWING AN EGO THREATENING EVENT

Pages in Study: 150

Candidate for the Degree of Doctor of Philosophy

Major Field: Educational Psychology

Scope and Method of Study: The purpose of this study was to assess whether increased self-awareness through expressive writing would help chronic dieters (CD) maintain dietary inhibition following an ego threatening event (i.e., lowered state self-esteem and mood). College women were recruited and categorized as either CD's or non-dieters (ND's) using Revised Restraint Scale scores. Participants were exposed to a failure task (i.e., ego threatening event) and then randomly assigned to either a high self-awareness writing condition (HSAWC) or low self-awareness writing condition (LSAWC). After twenty minutes of writing, participants were given cookies to "taste test."

Findings and Conclusions: A series of 2 (dieting status) X 2 (writing condition) analyses of variance were conducted on cookie grams consumed, linguistic markers of self-awareness in written text, and mood and state self-esteem following cookie consumption. Results showed that CD's were able to maintain dietary inhibition following an ego threatening event whether they wrote with high or low self-awareness.

ADVISER'S APPROVAL: Steve Harrist, Ph.D.
