

IMPLICATIONS OF THE PREOCCUPATION WITH FOOD IN EATING
DISORDERS AND ITS EFFECT ON THE SPREAD OF ACTIVATION
THROUGH SEMANTIC MEMORY

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IMPLICATIONS OF THE PREOCCUPATION WITH FOOD IN EATING
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THROUGH SEMANTIC MEMORY

A Thesis

Presented to the
Graduate and Research Council of
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In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by

Amy B. Rothmel

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DEDICATION

This thesis is dedicated to my parents

Mr. Jacob Rothmel

and

Mrs. Ellen Rothmel

who have given me their love, encouragement and guidance to find the

happiness and self-confidence within myself,

which they knew was always there.

Thank-you for being the "Wind Beneath My Wings."

This thesis is also dedicated to my husband

David

who never let me go and gave me the strength to move forward.

Thank-you for your patience and understanding,

for playing golf, and most of all, for being,

"One of a Kind."

I Love You!

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ABSTRACT

The focus of this study was to identify individuals who are predisposed to an eating disorder and to measure preoccupation with food by using a priming paradigm. Forty-eight female undergraduate students volunteered for participation in this study. The study consisted of two parts. In part one, subjects completed the Eating Disorder Inventory-2 (EDI-2) (Garner, 1991), a valid and reliable inventory of eating disorders. In part two, subjects were presented with 224 category-instance pairs. For each pair, subjects were to respond as quickly as possible whether the instance matched the category.

A Cluster Analysis was performed on the EDI-2 to identify two groups of similar individuals. The scores of one group were significantly greater than those of the other. Reaction time data was analyzed with a 2x2x2 mixed analysis of variance with cluster (low vs. high) as a between subjects variable and type of item (food vs. non-food) and priming condition (prime vs. not primed) as within subject variables. Although priming effects were obtained for both food and non-food items, the priming effects were comparable for the two groups. The failure to find a difference among the two groups in priming effects is contrary to what was expected.

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CHAPTER I

INTRODUCTION

Research on anorexia nervosa and bulimia nervosa has focused on the characteristics, causes, coping styles, and cognitive styles of these disorders. Yet, there is not much research available pertaining to how an eating disorder may affect an individual's preoccupation with food. The focus of this research was directed toward understanding the obsessive nature of anorexia nervosa and bulimia nervosa and observing how individuals with these eating disorders may display continuous thoughts about food.

Anorexia Nervosa

Anorexia Nervosa is translated to mean a "loss of appetite as a result of nerves" (Lefrancois, 1989). According to the Diagnostic and Statistical Manual-IV (American Psychiatric Association [APA], 1994), the person diagnosed as having anorexia refuses to maintain a normal body weight, approximately 15% below that which is expected.

Anorexia Nervosa seems to begin with a deliberate desire to be thin with consistent dieting; it ends in a condition where the individual is unwilling or unable to eat normally (Lefrancois, 1989). Additionally, individuals with anorexia may slowly empty their stomach by not eating, which may perpetuate the lack of desire for food (Harris, 1991). They often will discuss recipes or cook elaborate meals, and still never find time for themselves to eat (Sarason & Sarason, 1989). If they do eat, they eat alone or perform unusual habits to avoid eating, such as push their food around on their plate, cut their food into small pieces, throw their food in the trash, and sometimes vomit (Knopf, 1984). These avoidance techniques exemplify the behavior of the individual with anorexia. Furthermore, individuals with anorexia often exercise excessively in an effort to avoid

eating and to increase their weight loss.

The individual with anorexia nervosa may also tend to be obsessive-compulsive in nature (Kerr, Skok & McLaughlin, 1991). They may have extremely ritualized exercise programs to burn those hated and feared calories. Sometimes their exercise routines may be planned for, and continue over a twenty-four hour period (Kerr et al, 1991). In their study, Kaffman & Sadeh (1989) describe the characteristics of the anorexic syndrome as individuals restricting food intake, having a preoccupation with food as they display obsessive-compulsive tendencies to diet and reduce weight. The female anorexic's diet may be two-fold in that it not only manifests an obsessive-compulsive nature, but also an avoidance technique. This is exemplified by the adolescent using dieting as an attempt to run away from daily difficulties, to gain a sense of independence, or a tool to keep a family together. The individual gains a sense of control through dieting, and the restriction of food enhances the feeling of control, power, and self-esteem. In essence, the individual's preoccupation with food becomes dominant and obsessive in her thinking as it becomes a defining factor of power, control, and identity. Through the success of the diet, a goal has been reached (Kaffman & Sadeh, 1989).

Kaffman & Sadeh (1989) further explore "how the voluntary decision to lose some weight becomes a kind of demonic obsession, turning all thoughts and behaviors to a slavish preoccupation with food"(p. 485). Their research suggests that the preoccupation with food is a factor of the individual's personality and may be influenced by the individual's relationship with family members, usually their mother. For example, the message sent to a daughter might be to be a nice girl and to have outstanding

achievements in all areas of life (e.g. academic, work, and social functioning). The responsibility and pressure to live up to these expectations may become an impossible mission. The adolescent may develop an increased fear of failure, and so not to disappoint her parents, she confronts the challenge of the pressure to reach perfection. In doing so, she substitutes the challenge of external achievements, with the preoccupation with food and the internal struggle of rigid fasting and dieting (Kaffman & Sadeh, 1989). In this sense, a goal of perfection is displaced, becoming symbolic of a sense of success toward perceived parental expectations (Kaffman & Sadeh, 1989).

Speculation is that individuals with anorexia do not feel in control of their lives, so instead they control their body weight, and struggle with the idea of being perfect and attaining high achievements (Kerr et al., 1991). Furthermore, the female anorexic's surge for perfection may create a fear of making wrong choices, a tendency toward unrealistic goal setting, or an intense desire to be respected, self-confident, and successful. In addition, they may develop problems in identity formation or compulsive behaviors (Muuss, 1985).

An additional characteristic of anorexia nervosa is an overcontrolling ego, which can be seen not only in the preoccupation with food, but in a process called dichotomous thinking (Kerr et al, 1991) where thinking is an "all" or "nothing" process. One example of "all" or "nothing" processing is typified by the individual who is successfully dieting, but eats one item not identified as an "allowed" food in the diet. As a result of eating this item, the individual comes to believe that the diet is totally ruined and that she has failed.

Anorexia nervosa is most common in middle- and upper-class adolescents

(Sarason & Sarason, 1989). Its onset can range from early to late adolescence and even into early adulthood (Lefrancois, 1989). According to Knopf (1984), anorexia is fatal in approximately 10-15% of all cases. Some men are found to have the anorexia nervosa disorder, but it is not as common as in women.

Several physical problems may occur in individuals with anorexia, such as amenorrhea (loss of menstruation), lanugo (downy hair growth on extremities), a decrease in heart rate, and low blood pressure. Other medical complications include excessively dry skin, intolerance to cold weather, low white blood cell counts, low platelet counts, or even low serum protein values. It has also been recognized that malnourishment affects the brain and cognitive functioning (Harris, 1991).

Bulimia Nervosa

Bulimia Nervosa is characterized by the desire to be thin, with the addition of the self-perpetuating practice of binge-eating, followed by self-induced vomiting or other forms of purging behaviors such as the use of laxative or diuretics (Harris, 1991). There is a consistent concern with body shape and weight, and most importantly, the individual has a minimum of two binge-eating episodes per week for at least three months.

Individuals with bulimia eat very secretively and sometimes very quickly, hoarding in large amounts of food that are usually high in caloric content, sweet, or make it easier for the individual to consume an increased amount of food. Binges usually continue until there is abdominal pain, sleep, or social interruption. Vomiting is done to relieve

abdominal distention to continue the binge, or to terminate the binge completely (Knopf, 1984; APA, 1994).

Bulimia is sometimes hard to identify because, unlike individuals with anorexia who may appear emaciated, the individual with bulimia may be of normal weight (Knopf, 1984; Lefrancois, 1989). Many times, the bulimic woman's weight will fluctuate from one episode to another (Lefrancois, 1989; Harris, 1991).

Some characteristics that may accompany individuals with bulimia are depression, low self-esteem, and difficulty with interpersonal relationships (Kerr et al., 1991). Furthermore, they may have impulse difficulties which may lead them to unconventional behaviors such as stealing to obtain diuretics, laxatives, or food (Kerr et al., 1991).

Etringer, Altmeir & Bowers (1989) discussed cognitive functioning and found that individuals with various bulimic symptoms may share similar cognitive contents and functions, such as irrationally perfectionistic standards, a perception of having little or no control over eating, deficient cognitive coping skills, and a low threshold for stress tolerance.

Heatherton & Baumeister (1991) discussed the idea of an Escape Theory to describe the female bulimic's behavior. Their theory states that the female bulimic's binge eating arises out of a motivational attempt to escape from self-awareness. It is a way of avoiding their environment by narrowing their focus of attention to the present and immediate stimulus environment. Their self-awareness is kept low enough so as to avoid meaningful thoughts about ongoing identity and implications of trivial events (Heatherton & Baumeister, 1991).

The Escape Theory also proposes two levels of individual self-awareness. The first one is a high level of awareness which connects a person's constructs of immediate events to distant events. A high level involves a broad standard of evaluating the self against norms or expectations. The second is a low level of self awareness where there is no meaningful comparison against general standards. A low level is described by Heatherton and Baumeister (1991) as deconstructed. By deconstructing events, the individual is taking the meaning or symbolism away from the event, thus the event merely becomes a stimulus.

According to Heatherton & Baumeister (1991), individuals with bulimia display a low level of awareness (deconstruction process) as a way to escape from worries, threats, and pressures. The bulimic individual puts such high expectations on herself that the risk of failure is increased. The motivation to escape begins when a problem or setback arises in the comparison of herself to her high standards. If the expected goal is not reached, this is considered a failure and self-berating occurs. The negative self-statements (e.g. I'm a failure) persevere to the extent of creating negative affect, anxiety, and possibly depression. To escape the unpleasant feelings of anxiety, worry, or depression, the individual makes a cognitive shift and focuses on the immediate present (low level processing/deconstruction) generating irrational thoughts to avoid or escape the broad thoughts that initiated the uncomfortable feelings. The individual's reluctance to engage in meaningful processing creates less effective evaluation of ideals, expectations, and attainable goals (Heatherton & Baumeister, 1991).

Similarities Between Anorexia Nervosa and Bulimia Nervosa

Individuals with anorexia and bulimia share common characteristics, such as low self-esteem, sense of a lack of autonomy, difficulty with family communication, and overcontrolling egos. There is a high prevalence of both disorders in Caucasian females from higher socioeconomic families (Kerr et al., 1991). Both groups possess a strong desire to be thin and manifest a negative body image. They are also dissatisfied with their body size and exhibit perceptual distortions of body size (Kerr et al., 1991). Both groups also possess an intense fear of becoming fat.

Heatherton & Baumeister (1991), Kaffman & Sadeh (1989), and Yager, Landsverk & Edelstein (1987) report that individuals with anorexia and bulimia display cognitive distortion with regard to food and thought processing. Bulimic women have a fear that once they start eating they will not be able to stop. Anorexic women have a fear that eating just one cookie will make them fat. Furthermore, Kaffman & Sadeh (1989) found that individuals with anorexia and bulimia display cognitive dysfunctions through dichotomous, "all or none," thinking. It is also suggested that women with anorexia and bulimia display irrational logic, exemplified not only by dichotomous thinking, but by deleting appropriate meanings from events or actions and suspending normal or more appropriate patterns of reasoning (Heatherton & Baumeister, 1991; and Kerr, et al. 1991).

Other characteristics shared by anorexia and bulimia are impulse-control difficulties, obsessive-compulsive tendencies, and a preoccupation with food. Individuals in both groups exhibit a dieting process of rigidly controlling their food intake. It is their constant concentration on food and the idea that if they do not adhere to a strict diet, that

their fear of "feeling fat" increases to a sense of "being fat." The preoccupation with food combined with the irrational thoughts leads to obsessional brooding over gaining weight and incessant thoughts of striving for thinness (Kaffman & Sadeh, 1989; Heatherton and Baumeister, 1991; and Muuss, 1985). Thoughts of food further become prominent through behaviors such as pushing their food around on their plate to give the appearance of food being eaten, or cooking elaborate meals for others while they avoid eating a meal altogether.

Furthermore, individuals with anorexia and bulimia share a lost sense of control in their lives (e.g. feeling pressure to be perfect and to achieve excellence in order to attain acceptance by their family and peers). This feeling may create a cognitive shift to thoughts of food, giving them a sense of control that becomes a personal struggle of autonomy. For example, if the individual is thinking about the unpredictable future, the fear of the unknown may cause anxiety and a sense of being out of control. Her thoughts shift to the immediate present, to food, and to controlling their dietary intake, temporarily alleviating the feeling of being out of control. The cognitive shift to food temporarily restores a false sense of self control.

Both anorexic and bulimic women have been identified as possessing a preoccupation with food. This has been identified by the observation of ritualistic behaviors, such as hoarding food and excessive meal planning (Muus, 1985). Another way of observing the preoccupation with food is by objectively measuring thought processes. This method of observation can be understood through the spread of activation in semantic memory.

Spread of Activation through Semantic Memory

Anderson (1990), Collins & Loftus (1975), Loftus (1973), and Collins and Quillan (1969) presented network theories of semantic memory. These theories view semantic memory as consisting of a network of interconnected concepts. A concept is represented as a node in a network, and a network is made up of nodes and links. (Collins & Loftus, 1975). Each node possesses relational links that connect to other concept nodes (Anderson, 1990; Collins & Loftus, 1975). Anderson, 1990, suggests that it is easier to think of nodes in a semantic network as ideas, and to think of the link between the nodes as associations between the ideas. The search in memory between concepts, as described by Collins & Loftus (1975), involves following the path between concept nodes.

Often this search is thought of in quasineurological terms as spreading activation. The notion of the spread of activation is that when a node is activated, the activation of a given concept spreads to related concepts. After a concept is activated, the activation of one node activates the next node, which in turn activates another node. This activation continues to spread through the network. As it moves, the strength of the activation decreases, and concepts further from the originally activated nodes are less likely to be activated than closer concepts (Ellis & Hunt, 1993). An example used by Collins & Loftus (1975), involves the concept of fire engine. After fire engine is activated, the spread of activation results in nodes such as red, or vehicle being activated. This in turn activates other nodes such as colors or automobiles, and other related concepts. The spread of activation suggests that when a concept is activated, other items are activated to the extent that they are closely related to that item (Collins & Loftus, 1975).

It has been proposed that the level of activation is related to the level of awareness (Collins & Loftus, 1975). Specifically, if the level of activation of a node exceeds some criterion, then the individual will be consciously aware of the concept. It is possible, however, that a node may experience a level of activation which does not exceed this criterion. When this occurs, it should be very easy for the individual to bring the concept into conscious awareness.

Semantic networks help us to understand priming effects. Priming effects occur when the processing of one item from a category is facilitated by the prior processing of another item from the same category. An example of priming is provided by a study by Freedman & Loftus (1971). In the study, they gave participants a category and asked them to produce a word that belonged in that category. Participants were presented with a stimulus consisting of a noun category paired with either a letter or an adjective, and then asked to provide a word that belonged in the intersection defined by the pair. For example, a participant was given Color-B, and was to produce a color that began with the letter B, such as Blue (Freedman & Loftus, 1971). They found that if a participant was asked to name a member of a category, and soon after, was asked to name another member of the same category, facilitation in naming the second member occurred. That is, when "primed" by a category, participants responded faster to the same category, then when not primed by that category. This research suggests that an initial presentation of a category facilitates later production of instances from that category.

Experimental Test of Food Preoccupation

This study explored how the preoccupation with food influences cognitive processing. Research has indicated that individuals with eating disorders display a preoccupation with food. Furthermore, it has been suggested that the thought of food is invasive in individuals with eating disorders. If so, it would seem that food concepts would be in a partial state of activation, and would easily break into consciousness. Therefore, one would expect to observe faster response times to food items, and larger priming effects for food than non-food items, in individuals who either have, or are predisposed to, an eating disorder.

Participants

Forty-eight female students from undergraduate psychology classes at Austin Peay State University participated. They were volunteers and received class credit for their participation. An informed consent statement was signed by each individual. Participants were allowed to withdraw at any time.

Procedure

Participants were given the Eating Disorder Inventory-2 (EDI-2) to complete. The Eating Disorder Inventory-2 was administered to identify participants who demonstrated a predisposition, or similar characteristics and behaviors, toward an eating disorder. There was no time limit and participants were told to respond as best they felt the questions applied to them. After completing the EDI-2, each participant performed a word-classification task in which participants were required to judge whether a word (e.g. cake) belonged to a particular category (e.g. dessert).

Each trial of the word-classification task was conducted in the following manner. First, a rectangle would appear on the screen of a personal computer and would remain visible for the duration of the trial. Second, a category-word pair, printed in capital letters (e.g. DESSERT-CAKE), would appear in the center of the rectangle and remain visible until the participant responded. The participant indicated a positive response by pushing the "J" key on the computer keyboard. A positive response is exemplified by a matching category-word instance (e.g. COLOR-BLUE). A negative response was indicated by pushing the "F" key. A negative response is exemplified by a word not belonging to the

category (e.g. TOOL-SOCK). Following the individual's response, another pair was presented, and again the participant was required to make an affirmative or negative decision. The pattern was repeated for ten practice trials and 224 test trials. Both the speed of the participant's response (measured from the onset of a category-word pair to the participant's response) and the accuracy of the response were automatically recorded by the computer on each trial.

Materials

The Eating Disorder Inventory-2 (EDI-2),(Garner, 1991), was used in the first phase of the experiment. The EDI-2 is a self-report questionnaire given to ascertain which participants may be predisposed to an eating disorder. It consists of 91 items rated on a 6-point likert-type scale. Respondents answered whether each item applies "always," "usually," "often," "sometimes," "rarely," or "never." The EDI-2 scores yield eleven behavioral and psychological subscales which demonstrate characteristics common to both anorexia nervosa and bulimia nervosa. The original eight scales are Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, and Maturity Fears, and the three new scales are Asceticism, Impulse Regulation, and Social Insecurity. The scores do not diagnose individuals, rather the manual provides norms and a normative profile with the mean scale scores (and a 99% confidence level) for clinical and non-clinical groups to use as a guide for evaluating individual profiles (Klemchuk, Hutchinson & Frank, 1990).

The EDI-2 has proven to be a reliable and valid index of eating disorders (Garner, 1991). Criterion-related validity was indicated by demonstrating its ability to differentiate

between eating disordered and non-eating disordered individuals. Internal consistency for the eight scales was determined by Cronbach's alpha, with each scale being above .80 for an eating disorder sample, and an average (anorexic patients and female college comparison group) item-total scale correlation of .63. Concurrent validity discriminating anorexic patients from a female college comparison group was found by comparing patient self-report profiles with judgments made by clinicians who knew the patients' psychological profile (Garner, 1991). Through examination of the items, a high degree of face validity was found in that items relate to the domains of interest in a straight forward manner (Garner, 1991). There are considerable connections between the EDI-2 subscales (Garner, 1991). However, although measuring the same thing, the scales are able to discriminate between eating disorder and non-eating disorder individuals.

The word-classification task in the second part of the experiment used category-word pairs, consisting of food and non-food items. Most of the items used for the classification task were selected from the Battig & Montague (1969) category norms. Each of the categories chosen was paired once with the first and once with the second most frequently given instances of the category. Unfortunately, too few food categories were available from the Battig & Montague norms for the present research. Therefore, additional normative data relating to food categories were collected. Seven additional critical food categories were identified. Undergraduate students in two general psychology classes were asked to participate in generating normative data for the seven food related categories (e.g. Type of Dessert, Type of Meat, Type of Seafood). These participants were presented each category and then given one minute to write down the

first four responses that came to their minds. The two most common responses for each trial were selected for use in the classification task.

From the normative data collected and the categories from Battig & Montague, 224 category-word pairs were created. Forty-four of these categories were designated as target trials and the remaining were designated as either filler or prime trials. Half of the target trials involved a food category (e.g. DESSERT-CAKE); the remaining half involved a non-food category (e.g. TOOL-WRENCH). Half of the targets of both types were primed by preceding the trial with a category-instance pair that involved the same category; the other half were not primed and served as controls. For half of the filler stimuli, the category instance did not match the category name. The filler stimuli consisted of a category name paired with either the first or second most frequently given instance, and had no relationship to the food category stimuli. The remaining trials were not primed and served as controls. The trials were put in random order, and each participant viewed an identical listing of the stimuli.

RESULTS

According to the EDI-2 manual, a score of 14 or higher on the drive for thinness scale identifies someone at risk for an eating disorder. However, in the current study, few participants obtained a score this high. Therefore, a partitioned cluster analysis was performed to identify two groups of individuals who responded in different ways on the EDI-2. The first group identified by the cluster analysis consisted of forty individuals. The means and standard deviation for participants in this first group on the various scales of the EDI-2 are presented in Table 1. The second group identified by the cluster analysis consisted of nine individuals. The means and standard deviation for this group are also presented in Table 1. Analysis of variance revealed that the scores for participants in the second group were significantly higher than those for the first group on all scales but one, perfectionism (see Table 1). Because the scores of this second group are higher than those of the first, they will be referred to as the high risk group. The first group will be referred to as the low risk group.

Garner, 1991, derived normative data for Anorexia Nervosa-Restrictors (AN-R), Anorexia Nervosa-Bulimics (AN-B), Bulimia Nervosa (BN) individuals, and a Female College Comparison Group (FC1). The means and standard deviations for these groups are presented in Table 2. When the means for participants in the high risk group are compared to these norms it appears as if their scores are quite similar to the mean scale scores of the AN-R and the BN groups. In contrast, the means for the low risk group were more similar to the Female College Comparison Group. This suggests that the EDI-2 was successful in identifying two groups; one group (high-risk group) consisting of

individuals who had a response pattern similar to individuals diagnosed with an eating disorder and a second group (low-risk group) consisting of individuals who had a response pattern similar to a group of individuals who did not have an eating disorder.

Table 1. EDI-2 Means and Standard Deviation for Low and High Risk Groups for College Nonpatient Sample

	Cluster 1 Low Risk Group (N=40)		Cluster 2 High Risk Group (N=9)		Cluster 1 & 2 Summary of Statistics
EDI Subscale	M	SD	M	SD	F-Ratio
Drive For Thinness	4.33	4.34	11.11	6.12	14.567**
Bulimia	1.30	2.08	7.89	5.47	33.971**
Body Dissatisfaction	10.08	8.09	21.11	4.63	14.969**
Ineffectiveness	1.38	2.18	11.44	7.38	51.519**
Perfectionism	6.85	3.28	8.89	2.85	2.848
Interpersonal Distrust	1.98	2.10	5.22	3.26	13.360**
Interoceptive Awareness	2.03	2.71	10.67	7.09	34.614**
Maturity Fears	2.45	2.72	7.67	4.92	18.286**
Asceticism*	3.85	2.01	10.67	3.89	54.006**
Impulse Regulation*	1.48	2.51	7.89	4.25	34.241**
Social Insecurity*	2.35	1.88	9.44	4.27	56.922**

*=New scale on the EDI-2

**= significant difference between cluster 1 and 2 with $p < .001$

Table 2. Original EDI and Provisional Subscale Scores for Eating Disorder Subgroups and Nonpatient Female Comparison (FC1) Group

EDI Subscale	Anorexia Nervosa Restrictors (AN-R) (N=129)			Bulimia Nervosa (BN) (N=657)			Female College Comparison Group (FC1) (N=205)		
	M	SD	Median	M	SD	Median	M	SD	Median
Drive For Thinness	11.3	7.0	12	15.0	5.0	16	5.5	5.5	4
Bulimia	1.8	3.5	0	10.8	5.4	11	1.2	1.9	0
Body Dissatisfaction	11.9	7.9	11	17.9	7.9	19	12.2	8.3	12
Ineffectiveness	11.4	8.4	11	11.0	7.5	10	2.3	3.6	1
Perfectionism	8.9	5.3	10	8.8	4.8	9	6.2	3.9	6
Interpersonal Distrust	6.9	5.3	7	5.3	4.5	4	2.0	3.1	1
Interceptive Awareness	9.2	6.9	9	11.1	6.8	10	3.0	3.9	2
Maturity Fears	4.8	5.1	3	4.4	4.6	3	2.7	2.9	2
Asceticism*	8.0	6.8	6	8.5	4.0	8	3.4	2.2	3
Impulse Regulation*	5.6	5.1	5	6.1	5.4	5	2.3	3.6	1
Social Insecurity*	9.6	5.5	11	8.2	4.5	8	3.3	3.3	2

*Ns for eating disorder subgroups are as follows: AN-R=22, AN-B=17, BN=68

(Garner, 1991)

Figure 1 and Figure 2 show the mean reaction time for both groups. This data was analyzed with a 2x2x2 mixed Analysis of Variance with group (high vs. low) as the between participant variable and type of item (food vs. non-food) and priming condition (primed vs. non-prime) as the within participant variables. Only data from the target trials

was analyzed. The analysis indicated that, overall, there was no difference between the two groups in the time taken to respond $F(1,47)=1.444, p>.05, MSE=.189$. As suggested by the figures the responses to food stimuli were significantly slower than the responses to non-food stimuli, $F(1,47)=126.705, p<.001, MSE=.012$. Furthermore, this pattern did not differ significantly for the two groups $F(1,47)=.800, p>.05, MSE=.012$. The responses to the target stimuli were faster when preceded by a prime stimulus, $F(1,47)=19.079, p<.001, MSE=.014$. But the effect of the prime stimulus was the same for both groups, $F(1,47)=.027, p>.05, MSE=.014$. The interaction between type of item and priming condition was significant, $F(1,47)=11.082, p<.005, MSE=0.11$. Specifically, the effect of priming was greater for food items than non-food items. Although the priming effects for non-food items appear to be quite small, a t-test revealed that it was statistically significant $t(48)=2.051, p<.05$. Finally, the interaction between type of item and the priming condition did not vary significantly between the two clusters $F(1,47)=1.090, p>.05, MSE=0.011$.

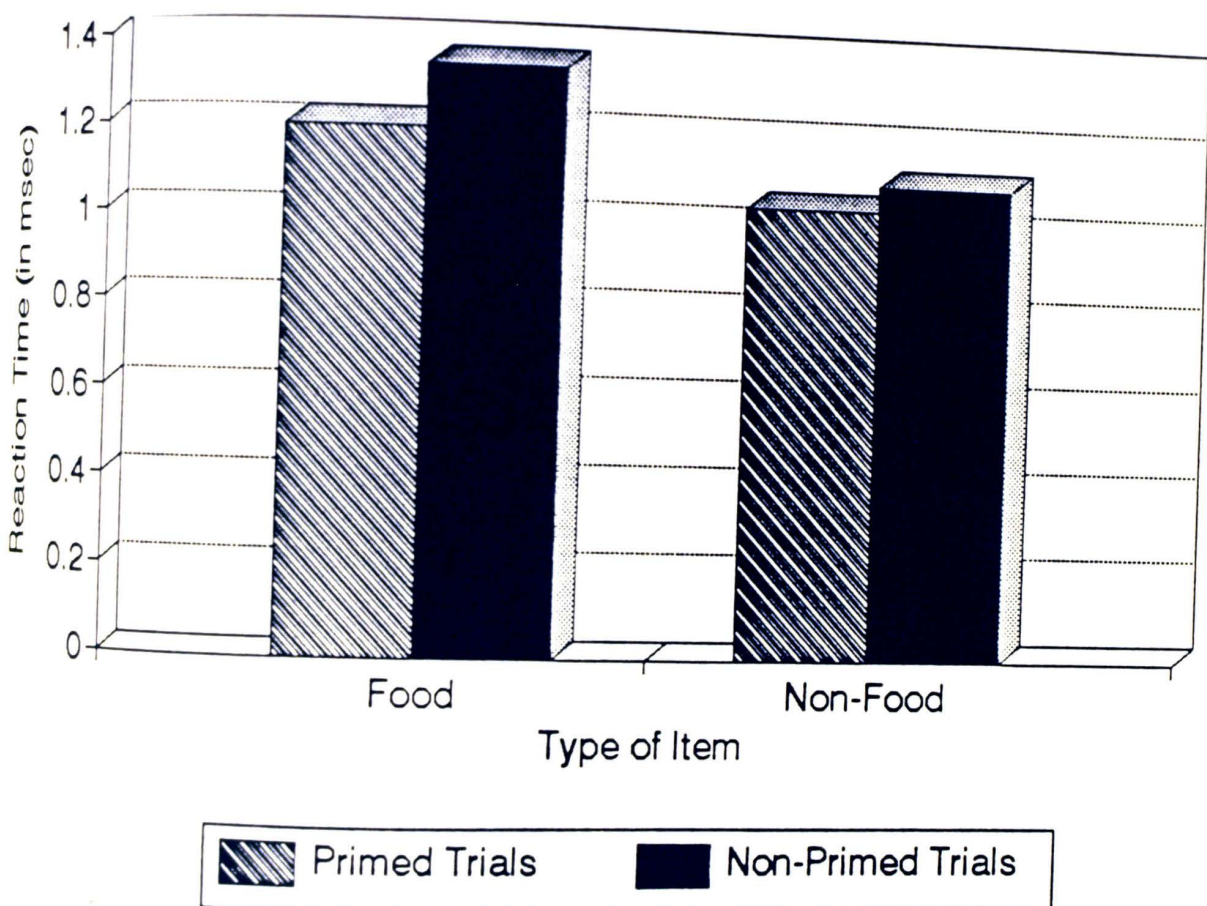


Figure 1. Reaction Time as a Function of Trial Type Low Risk Group.

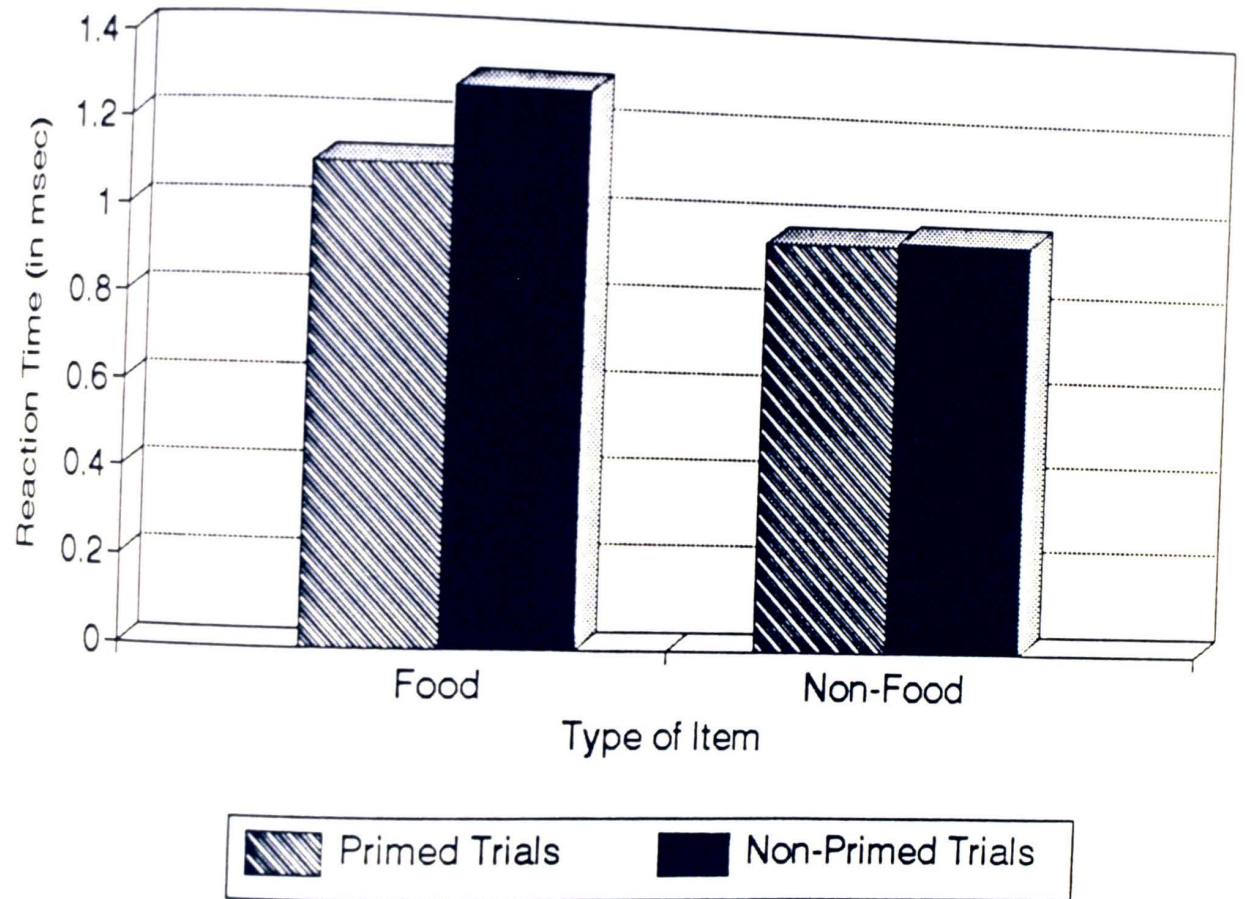


Figure 2. Reaction Time as a Function of Trial Type High Risk Group.

CHAPTER 4

DISCUSSION

It was expected that individuals predisposed to an eating disorder would have faster reaction times to food categories than non-food categories. This expectation was based on the idea that food concepts would have already been partially activated because of the preoccupation with food, which is thought to be characteristic of these individuals. Instead, individuals in both groups appeared to have similar reaction times when responding to food and non-food items. Although the current research failed to find faster reaction times between the two groups, the study was successful in obtaining priming effects.

One possible explanation for the failure to find a difference in reaction times may have been due to the requirement that a non-clinical population had to be used in this study. Because there was not access to a clinical population, the EDI-2 was used to characterize weight preoccupied individuals. A non-clinical population may have a weight preoccupation, but they may not resemble a clinical population's core emotional disturbance (Garner, 1991). Individuals in the non-clinical population preoccupied with eating, weight and body may show weight losing behaviors, but they may not possess the psychological disturbances found in individuals diagnosed with anorexia or bulimia nervosa. Although the non-clinical population may display some weight preoccupied characteristics, they are not a clinical population. Hence, their thought processes may be different. Therefore, the non-clinical population may not demonstrate the preoccupation with food necessary to result in faster reaction times to food items. Because cognitive differences have been demonstrated between eating disorder and non-eating disorder

populations (Etringer, et al. 1989, Muus, 1985, Klemchuk et al., 1990, Garner, 1991), it is possible that a clinical population would still demonstrate the differences which were predicted.

A second possible explanation for the negative results is that the preoccupation is not driven by an unconscious process in the semantic network, and what may have occurred is a conscious process. The prediction was based on the spread of activation which is an unconsciously driven process. Since the prediction was not supported there is the possibility that the spread of activation is not responsible for the food preoccupation characteristic of individuals with anorexia or bulimia nervosa. What may be happening is a conscious willful act on the individual's part. The individual may be consciously involved in activities related to food to control their thoughts. In addition, if there is a sense of feeling out of control, conscious control of thoughts surrounding food may give a false sense of control within themselves or over other aspects of their life.

A final factor supporting the theory that the preoccupation with food is a conscious process is that many efforts to restrict one's food intake may begin by learning which behaviors to avoid or continue, to achieve their weight goal. These behaviors are learned and practiced by either negative (gaining weight) or positive (losing weight) reinforcement. The research in this study suggested behaviors in which individuals with anorexia and bulimia try to control their food intake. They avoid eating, make elaborate meals for others, push their food around on their plate, or eat only in secrecy. In order to apply these behaviors, it can be assumed that one must be thinking about food, in order to avoid, cook, push, or hide it. In other words, the individual makes a conscious effort to

perform a behavior that will succumb to self-gratification. Furthermore, they must make a conscious effort to maintain their control to keep up their ritualistic behaviors.

Methodological problems within the study may have further impacted the results. The first problem may have been the participants' awareness, prior to their voluntary participation, that the study revolved around food and eating disorders. The food categories could have already been activated in all participants possibly eliminating differences between the high and low risk groups. In conjunction with reaction time and priming effects, an interaction was found between priming condition and food items. This stated that individuals in both groups had faster reaction times when primed for food items then when not primed. Furthermore, the effect of the prime was greater with food categories than with non-food categories. With prior knowledge of the purpose of the research, participants may have been actively searching for the food categories. Future research may help to understand why participants did not respond faster to food items, and instead had faster reaction times to non-food items.

A second methodological problem may have involved the categories which were used. Non-food categories and five food categories were chosen from the research by Battig & Montague (1969). To complete this research, additional food categories were created, and those categories may not have been as common as those in the Battig & Montague norms (Battig & Montague, 1969). This may have affected the cognitive processing that took place by slowing down the simple generation of an instance, and causing a increase in reaction time.

Future investigations into this line of research may be extended by adding new

factors. As previously discussed, individuals with eating disorders may have a tendency to have a sad- or depressed mood state (Kerr, 1991; Muus, 1985; Piazza, et al., 1983; Harris, 1991). Studies by Ellis (1991) and Hertel & Rude (1991) suggest that depressed or disruptive mood states may increase the amount of irrelevant thoughts a person has while performing a cognitive task. Ellis et al. (1984) contend that performance of tasks where encoding demands are high may be influenced by the depressed mood state possibly creating an interference in recall. In addition, the depressed mood state may distract the individual from using the appropriate thoughts or strategies to complete a task successfully. Ellis's assumption may imply that individuals with anorexia and bulimia may also have difficulty in processing and performing cognitive tasks successfully because of interfering irrelevant thoughts and depressed mood. Further research may indicate that individuals with anorexia nervosa or bulimia nervosa who are dually diagnosed with depression may not only have a preoccupation with food, but may have an overall slower response time due to slower cognitive processing from the depression.

Understanding the cognitive processing involved in individuals with eating disorders is essential. It can assist in applying the appropriate treatment, as well as, provide an understanding of the anorexic or bulimic individual's sense of being out of control. Individuals with eating disorders often report a sense of being out of control, and in order to gain back some self-control, they fervently regulate their food intake. As previously researched, the preoccupation with food has a behavioral impact on eating disorders. In addition, it also has an influence on an individual's cognitive thoughts, such as irrationalities and berating statements. This study contends that a deeper understanding

of cognitive processing within the network of the brain may clarify an individual's control over their eating disorder. If the preoccupation with food is considered to be a conscious effort, then the preoccupation, as well as the ritualistic behaviors surrounding food, may in essence, be a coping strategy. If the preoccupation with food is not exhibited as a conscious effort, then the sense of being out of control may be a true implication suggesting that the development of an eating disorder is honestly beyond one's control.

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APPENDIX

Informed Consent Statement

The purpose of this investigation is to prove that individuals who are predisposed to an eating disorder will have a preoccupation of food. Your responses are confidential. At no time will you be identified nor will anyone other than the investigators have access to your responses. The demographic information collected will be used only for purposes of analysis. Your participation is completely voluntary, and you are free to terminate your participation at anytime without any penalty.

The scope of the project will be explained fully upon completion.

Thank you for your cooperation.

I agree to participate in the present study being conducted under the supervision of a faculty member of the Department of Psychology at Austin Peay State University. I have been informed, either orally or in writing or both, about the procedures to be followed. The investigator has offered to answer any further inquiries as I may have regarding the procedures. I understand that I am free to terminate my participation at any time without penalty or prejudice and to have all data obtained from me withdrawn from the study and destroyed. I have also been told of any benefits that may result from my participation.

Name (Please Print)

Signature

Date

RESEARCH INVOLVING HUMAN SUBJECTS

Title of Proposal: Category Norming

principal Investigator: Amy Rothmel

Sponsor (if student): Dr. Charles Grah (Psychology)

Action of the human Research Review Committee:

XV A. Approved as described. Researcher is responsible for obtaining approval from the Committee prior to introducing any changes in protocol; for keeping signed consent statements for the duration of the project and 3 years thereafter; and informing the Committee of an unexpected physical or psychological effects on subjects.

B. Approved with recommendations as follows:

Researcher may revise the project in accordance with recommendations and communicate in writing the changes which have been made; discuss the action with the Committee; or withdraw the proposal.

c. Proposal deferred for additional evidence as follows:

Further action is contingent on the investigator supplying the committee with appropriate information.

 D. Proposal not approved for the following reasons:

Researcher may revise the project or discuss the action with the Committee.

Reviewed by: xx Chairperson, Human Research Review Committee Dr. Susan Kupisch for William Ellis
9/30/93 Signature

Membership,
Human Research Review Committee

Signature

Copies to: 1. Investigator
2. File with proposal

Date _____