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The Effects of a Contingency Contract on Bulimic Behavior

Tim Lee Vander Molen
Western Michigan University

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THE EFFECTS OF A CONTINGENCY CONTRACT ON BULIMIC BEHAVIOR

by

Tim Lee Vander Molen

A Thesis
Submitted to the Faculty of The Graduate College
in partial fulfillment of the requirements for the Degree of Master of Arts
Department of Psychology

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THE EFFECTS OF A CONTINGENCY CONTRACT
ON BULIMIC BEHAVIOR

Tim Lee Vander Molen, M.A.
Western Michigan University, 1985

In dealing with a 22 year old university student suffering from bulimia, two factors of the subject's behavior must be corrected. First, the subject must regain control over eating. This was done by having the subject regulate the type and amount of food consumed and the time of day in which food was consumed. Second, the subject must correct the misconceptions about body weight, body image, and means of weight control. This was done by having the subject read and discuss relevant literature which force the subject to reevaluate the concepts of body weight and weight control. To clarify the treatment, a contingency contract was designed. This contract clearly stated what behaviors were expected of the subject. The contract also stated the consequences that would be applied contingent upon non-productive behavior. This contingency contract was successful in eliminating the bulimic behavior.
ACKNOWLEDGEMENTS

At this time, I would like to thank the one man that made it possible for me to enter graduate school—Dr. Roger Ulrich. He took a chance, accepted my application, and for this I will always be grateful. We may not have always agreed on issues, but he was willing to ask the difficult questions of life. It was these questions that kept him on the cutting edge of science. Because of his ability to ask the difficult questions, he enhanced my education ten fold.

I would also like to thank Dr. Kay Malott and Dr. Neil Kent for their guidance, encouragement, and understanding during the writing of this thesis. I am grateful to Dr. Robert M. Oswald who influenced my practical experience and supervised my clinical work, and Dr. Geoffrey Hammond, M.D., for the use of his agency for the purpose of continuing my education into eating disorders.

My journey through higher education was not an easy one; many disappointments occurred during the trip. If it were not for the emotional support and encouragement of my dear friends, I would not have finished the trip.

Last but not least, I would like to thank my parents, brother, and wife for coming through when I needed them the most. They are the greatest teachers of them all. They taught me by example, love, caring, compassion, and patience. I would like to thank them for the many sacrifices they made to keep me in school.
I must not forget the support I received from a dear friend of mine, Chuck Wolfgram, who was killed so tragically by a drunk driver while attending Western Michigan University. It is within the spirit of friendship that I dedicate this thesis to him. May my friend rest in peace knowing that he is not forgotten.

Tim Lee Vander Molen
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CHAPTER I

INTRODUCTION

Bulimia, sometimes known as bulimarexia (Boskind-Lodahl and Sirlin, 1977), dysorexia (Guiora, 1967), bulimia nervosa (Russell, 1979), and dietary chaos syndrome (Palmer, 1979), has been observed in adolescent and college age women since the Roman era. Bulimia has been considered to be an eating disorder usually associated with anorexia nervosa (Rosen and Leitenburg, 1982, Russell, 1979, Mitchell, Pyle, Eckert, Hatsukami, and Lentz, 1983). However, bulimia is now characterized as a separate and distinctive disorder (Herzog, 1982, Rich, 1978, Abraham and Beumont, 1982, Johnson and Sinnott, 1981).

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM III, 1980), bulimia is characterized by the following:

A. Recurrent episodes of binge eating (rapid consumption of a large amount of food in a discrete period of time, usually less than two hours).

B. At least three of the following,

1. Consumption of high-caloric, easily ingested food during a binge.
2. Inconspicuous eating during a binge.
3. Termination of such eating episodes by abdominal pain, sleep, social interruption or self-induced vomiting.
4. Repeated attempts to lose weight by

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severely restrictive diets, self-induced vomiting or use of cathartics or diuretics.  
5. Frequent weight fluctuations greater than ten pounds.

C. Awareness that the eating pattern is abnormal and fear of not being able to stop eating voluntarily.

D. Depressed mood and self-deprecating thoughts following eating binges.

E. The bulimic behavior is not correlated with anorexia nervosa or any other known physical disorders. (DSM III, 1980, p. 69)

The morbid fear that the bulimic has of being overweight and the belief that vomiting is a safe or acceptable means of weight loss is well noted in the literature (Fairburn and Cooper, 1982, Rosen and Leitenberg, 1982, Fairburn, 1982). In actuality, the bulimic's body weight ranges between 10% above normal body weight to 10% below normal body weight (Fairburn and Cooper, 1982, Rosen and Leitenberg, 1982, Mitchell et al., 1983).

A person suffering from bulimia may experience both physical and emotional side effects, which in some cases may be fatal. Some of the physical factors associated with bulimic behavior are dental erosion, unexplained hypokalemia, parotid enlargement, rectal bleeding (Herzog, 1982), fluid disturbances, gastric dilatation, gastric rupture (Mitchell et al., 1983), total body sodium deficiencies with associated secondary hyeraldosteronism and potassium deficiencies as well as other electrolyte disbalances (Rich, 1978).
The emotional side effects which are correlated with bulimic behavior are severe clinical depression, alcoholism (Herzog, 1982), extreme guilt (Fairburn and Cooper, 1982), severe mental preoccupation with food (Rosen and Leitenberg, 1982), suicide tendency, severe mood swings, anxiety, insomnia (Abraham and Beumont, 1982), and problems with impulse control (Herzog, 1982).

The true etiology of bulimia is unknown; however, the theories that do exist can be broken down into two theoretical schools of thought: Physical Abnormalities and Environmental Factors.

One theory, which comes from the physical abnormalities school of thought, states that bulimia is caused by a neurological dysfunction similar to epilepsy or is due to an abnormal electroencephalogram, such as the 14 and 6 per second positive spikes pattern. There are also suggestions that there may be a chemical disturbance in the hypothalamus region of the brain that affects the appetite/satiety center (Johnson and Sinnott, 1981). In few cases, bulimic behavior may be attributed to a chemical reaction produced by the use of an oral contraceptive (Herzog, 1982).

It should be noted that the bulimic behavior pattern has been observed in subjects suffering from physical diseases. Diseases known to be correlated with bulimic-like behavior are Kleine-Levin syndrome (Johnson and Sinnott, 1981, Rich, 1978), Huntington's chorea, and
Parkinson's disease (Johnson and Sinnott, 1981).

The home environment is an important factor that may contribute to the development of bulimia. In some cases the onset of bulimic behavior may be attributed to a loss of a significant other (Cauwels, 1983). Bulimic's parents, especially the father, may demonstrate weak internal control, unmodulated expressions of hostility, and the absence of emotionally satisfying intrafamilial ties (Strober, Salkin, Burroughs, and Morrell, 1982) which create a great deal of stress within the whole family system. Another common theme is intense competition with siblings, especially with an older brother. No matter how perfect or successful the younger sister is, the accomplishments of the older brother are regarded more highly by the father (Boskind-White and White, 1983).

At the present time, there are only a few controlled behavioral studies dealing with the treatment of bulimia. For example, Linden (1980) decreased bulimic behavior of a 20 year old female university student by using assertiveness training to strengthen the relationship with her boyfriend and widen her range of social activities. By doing this, the environmental stress which was produced by a poor relationship with her boyfriend was decreased.

Fairburn (1982) used a two-part treatment plan to decrease bulimic behavior of eleven out-patients. First, to control binge eating, each patient recorded the amount
and type of food eaten. Second, Fairburn tried to improve the patient's problem solving skills by using a technique designed by Goldfried and Goldfried (1975). By using the Goldfried and Goldfried technique, the subject's lack of control over eating was corrected, therefore decreasing the amount of internal stress. The results of the study indicated that only nine subjects finished the study, and for those nine the frequency of bulimic behavior was effectively reduced to less than once a month.

Most studies dealing with the treatment of bulimia have been based on individual psychodynamics or drug therapy. For example, Boskind-Lodahl and Sirlin (1977) used "consciousness raising" to treat binge behavior. As with most studies using individual psychodynamics no significant results were found. By the same token, Rich (1978) used the drug, desipramine hydrochloride (norpramin), to treat bulimic behavior. After three months of treatment, the subjects showed no decrease in the bulimic behavior. Drug therapy has also typically been less than effective in the treatment of bulimia.

Although few behaviorally oriented studies have dealt with the vomiting and eating behavior of bulimics, many such studies have been performed to eliminate both the vomiting associated with anorexia nervosa and the binge eating pattern of compulsive eater.

For example, Aragona, Cassady, and Drabman (1975) used response-cost and reinforcement to decrease the
compulsive eating, as measured by weight, of 12 overweight girls. In this study, money, which was supplied by the parent, was used as a reinforcer and a contingency contract was used to clarify the reinforcement procedure. At the end of 13 weeks, the average weight loss was 13 pounds. Likewise, Kenny and Solyom (1971), used aversive conditioning (shock) to decrease the vomiting behavior of a 22 year old female anorexic. In the study, the vomiting behavior was broken down into 8 steps. Moving from one step to another, the subject would produce a mental image. Once this image was clear the therapist would shock the subject. The procedure proved to be effective in stopping the vomiting behavior after 15 weeks.

Due to the fact that behavioral strategies have proved effective in decreasing bulimic-like behavior of anorexics and overweight subjects, the present study used similar techniques. A contingency contract was used to eliminate the binge-vomit behavior and control food intake. Also a misconception correction procedure was used to decrease the subject's incorrect concerns about food, eating and body weight.
CHAPTER II

METHOD

Subject

The subject was a 22 year old female university student. She lived off campus with three other female students. At the onset of the study, the subject was 5 feet 6 inches tall and weighed 132 pound, approximately normal weight for her height according to the Metropolitan Height and Weight Table (1983, see Appendix F). She reported that she had engaged in bulimic behavior for five years and had learned this behavior during high school, from a friend. The subject also stated that the binge vomit behavior had reached a frequency as high as 6 times a day before the onset of the study. It should be noted that subjects with bulimia tend to under-report the severity of their problems when they are first evaluated and early in their treatment (Mitchell et al., 1981).

The subject indicated that she would binge on grain products, especially bread, as well as sweets. To facilitate vomiting, the subject would drink large amounts of liquids. The liquids were used as a medium to make vomiting easier. On some occasions, liquid intake would range upwards to one and one half gallons per binge. Vomiting was done very seldomly at home, due to social disapproval.

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by some of her house mates. Vomiting usually occurred at heated restroom of local gas stations. The subject reported that heated restrooms were necessary in the winter due to the time involved in vomiting. Laxative abuse was not prevalent with this subject.

The subject complained of being cold throughout the day, as well as having overwhelming thoughts of food. The subject also made many statements about her body and food which would normally be considered incorrect or grossly exaggerated. Many of these statements dealt with being overweight. She explained that after eating, she would swell up to the size of a pregnant woman. She stated that even drinking a glass of water would enlarge the joints of her fingers and increase the size of her legs. The subject also made many statements that she was concerned about her teeth decaying. She indicated that at the present time the teeth showed no signs of significant dental decay. However, the subject's dental condition was not evaluated by a dentist during any part of the study.

Setting

The study was conducted at the Behavioral Research and Development Center of Western Michigan University. The therapy room was located in the basement of the center. The therapy room was 14 feet by 16 feet and had a small
standard size basement window located on the south side wall. The room was equipped with standard office furniture: desk, chairs, table, floor lamps, pictures, and book cases. The furniture was arranged in such a way that the room appeared "homey" in nature.

Data Recording

Throughout the study, a number of physical and behavioral recording devices were used. One such recording apparatus was an incident recording sheet (see Appendix A). This was used during baseline for the purpose of having the subject record the type and amount of food consumed, as well as the number of binges and vomitus.

Another recording apparatus that was used during baseline was the Self Perception Inventory Test (SPI). The Self Perception Inventory Test is a twelve factor test of personality. The twelve subscales included rigidity-dogmatism, consistency, uncommon response, authoritarianism, self-actualization, anxiety, depression, paranoia, supervision, time, general adjustment, and general maladjustment. The purpose of the test was two fold. The first purpose was to aid in the evaluation of the subject. The second was to evaluate the therapeutic progress of the subject, and in turn, evaluate the treatment packet.

A biographical data sheet (see Appendix B) was filled out by the subject during pre-baseline. This
form contained questions necessary for evaluation of the subject's condition.

A second incident recording sheet (see Appendix C) was used during Phase 1. This recording sheet was designed as a guide to proper eating. The recording sheet was divided into three levels: morning, afternoon, and evening. Each of the three sections was broken down into six parts: meats, breads, milk, vegetables, fruits, and fats. This recording sheet also had a place to record the type and amounts of food consumed, total daily calories, number of binges, number of vomitus and the date.

A tape recorder was used to record all sessions. These recording were used by the therapist for evaluation purposes.

To insure that the subject was in good physical health, a number of medical tests were performed. The medical tests included CBC and electrolysis. The medical tests were also used to determine if the subject was following the procedure.

Procedure

In this study, the form of treatment that was used was a contingency contract. This contract clearly listed the contingencies of each phase (see Table 1).
Table 1

Contingencies of Contract

Pre-Baseline: No contingencies, However, the subject will record the number of vomitus, binges, and types and amounts of food eaten.

Baseline: 1. Subject will provide $100.00 dollars to be used as a reinforcer.
2. The subject will record number of vomitus, binges, and food intake. For this the subject will receive 2 points per day. If the subject fails to do this, 5 points will be removed per days missed from total score.
3. The subject will receive 25 points for taking an electrolyte test. If the subject fails to take the electrolyte test, 40 points will be removed per test missed from total score.

Phase 1: Besides the contingencies in Baseline, the following contingencies were added:
1. The subject will receive 5 points for following the diet per day. If the subject fails to follow the diet, 15 points will be removed per days missed from total score.
2. The subject will receive 5 points per reading. If the subject fails to do this, 15 points will be removed per reading missed.
The treatment packet was broken down into 3 phases: Pre-baseline, Baseline, and Phase 1. During the Pre-baseline phase, the subject was instructed on ways to record data accurately. The data collected were number of vomitus, number of binges, and types and amount of food eaten. These data were placed on an incident recording sheet daily. Also, during this phase, the subject completed a biographical data sheet and signed an informed consent form (see Appendix E), which stressed confidentiality. The subject was administered the Self-Perception Inventory Test.

During this Pre-baseline phase, the therapist verbally praised the subject contingent upon accurate data collection and gave instruction when needed concerning ways to correct mistakes during data recording. The subject was allowed to talk freely about herself and the bulimic behavior. The therapist talked about the forms of treatments that had been performed in the past on bulimic behavior, as well as the treatment to be used in this study. In general, Pre-baseline phase was used to train the subject in data collection as well as to gain information about the subject and her disorder. Pre-baseline lasted 6 days, and during that time the therapist met with the subject for 3, 1 and \( \frac{1}{2} \) hour sessions.

During Baseline, many of the contingencies of the contract were enacted. The subject provided $100.00
dollars to be used as the reinforcer. Each day, if the subject recorded the number of vomitus, number of binges, and food intake, the subject was rewarded with 2 points. If the subject failed to do this, 5 points per day were lost. Also, the subject received 20 points per electrolyte test. The electrolyte tests were intermittently requested of the subject without warning. If the subject failed to take an electrolyte test, 40 points were removed.

During Baseline, the therapist reviewed the data, praised the subject for good data collection, gave feedback on the data, and carried out the contingencies of the contract. Baseline lasted 12 days. During this time, the therapist met with the subject for 4, 1 and \( \frac{1}{2} \) hour sessions.

During Phase 1, all contingencies of the contract were carried out. Besides the contingencies in Baseline, the following were added: The subject received 5 points per day for following the diet correctly. If the subject failed to do so, 15 points per day were removed. Also, the subject received 5 points per day per reading. If the subject failed to do the readings, 15 points per day were removed.

The diet plan, used during Phase 1, consisted of a complete list of food which was broken down into 6 groups: meat, bread, milk, vegetables, fruits, and fats. The list of foods consisted of those food which the subject recorded on the incident recording sheet 1., during Pre-baseline, as well as a number of foods that did not appear on the
incident recording sheet 1.

The subject's day was broken into 3 parts: morning, afternoon, and evening (see Appendix D). The morning part of the subject's day was broken into 8 units. The units represented a type of food group which the subject would eat during the morning. It should be noted that the nutritional value of each unit varied. For example, a meat unit contained 55 calories, a bread unit contained 70 calories, a fruit unit contained 40 calories, a vegetable contained 25 calories, a milk unit contained 80 calories, and a fat unit contained 45 calories.

During the morning, the subject was instructed to consume 2 units of meat, 2 units of bread, 2 units of fruits, and 2 units of fats, as indicated on the incident recording sheet 2. The afternoon and evening were each broken up in similar ways. The subject was also allowed to save up to 3 units to be eaten as a "treat" during the late evening.

During Phase 1, the therapist met with the subject for 7, 1 and \( \frac{1}{2} \) hour sessions. During these sessions, the subject read relevant literature which corrected many of her false beliefs about the effect of food. After the readings, a discussion of the literature took place between the therapist and the subject. The reading included topics such as: "How to Maintain Normal Body Weight," "What is Normal Body Weight," and "Side Effects of Bulimia."
The criterion for termination of phase one was 10 days of vomit/binge-free days. At this point, the payback contingency was in effect (see Table 2).

Table 2
Contingencies of Pay-back

<table>
<thead>
<tr>
<th>Total Percentage of Points Earned</th>
<th>Percentage of Money Pay-back</th>
</tr>
</thead>
<tbody>
<tr>
<td>95% to 100%</td>
<td>100%</td>
</tr>
<tr>
<td>90% to 94.99%</td>
<td>75%</td>
</tr>
<tr>
<td>85% to 89.99%</td>
<td>50%</td>
</tr>
<tr>
<td>80% to 84.99%</td>
<td>25%</td>
</tr>
<tr>
<td>79.99% and below</td>
<td>0%</td>
</tr>
</tbody>
</table>

If the subject earned 95% to 100% of all total points, the subject would receive 100% of the money back. If the subject earned 90% to 94.99% of all total points, the subject would receive 75% of the money back. If the subject earned 85% to 89.99% of all total points, the subject would receive 50% of the money back. If the subject earned 80% to 84.99% of all total points, the subject would receive 25% of the money back. If the subject earned less than 79.99% of all total points, the subject would forfeit all money.
CHAPTER III

RESULTS

This form of behavioral treatment, contingency contracting, may have been successful in eliminating the bulimic behavior of a university female student.

Figure 1 represents 6 sessions of Pre-baseline, 12 sessions of Baseline and 14 sessions of Phase 1. The data are placed upon a semi-logarithmic scale graph. Solid points represent the number of calories consumed; open points represent the number of vomitus-binges per day. It should be noted that when there is no binge-vomit point, the subject reported that no binge-vomit occurred that day.

The data indicate that during Pre-baseline, calorie intake ranged from a high of 4500 calories to a low of just 380 calories. This produced a statistical range of 4120. The subject's mean calorie intake for Pre-baseline was 1347. During this time, the subject's binge-vomit behavior ranged from a high of 1 per day to a low of 0.

During Baseline, the subject's calorie intake ranged from a high of 5200 calories per day to a low of 420 calories per day. This produced a statistical range of 4780. The subject's mean calorie intake for Baseline was 3164. During Baseline, the subject's binge-vomit behavior ranged...
from a high of 3 per day to a low of 0, with a mean of 1.4. During Phase 1, the subject's calorie intake ranged from a high of 1500 calories to a low of 550 calories per day. This produced a statistical range of 940. The subject's mean calorie intake for Phase 1 was 1200. Only one binge-vomit occurred during the entire 14 days of phase one; this was on the 3rd day. (see Figure 1)
Another indication of the possible decrease of bulimic behavior was shown in the improvement of the electrolytes. Table 3 represents the pre-electrolyte test given during the Baseline phase and the post-electrolytes given during Phase 1.

**Table 3**

**Electrolyte Test**

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUN</strong></td>
<td>7mg/dl</td>
<td>9mg/dl</td>
<td>8-26mg/dl *</td>
</tr>
<tr>
<td><strong>BUN/CREAT RATIO</strong></td>
<td>8.8</td>
<td>12.9</td>
<td>10-20 **</td>
</tr>
<tr>
<td><strong>SODIUM</strong></td>
<td>143mmol/l</td>
<td>141mmol/l</td>
<td>137-150mmol/l</td>
</tr>
<tr>
<td><strong>POTASSIUM</strong></td>
<td>4.2mmol/l</td>
<td>4.6mmol/l</td>
<td>3.5-5.3mmol/l</td>
</tr>
<tr>
<td><strong>CHLORIDE</strong></td>
<td>100mmol/l</td>
<td>101mmol/l</td>
<td>95-106mmol/l</td>
</tr>
<tr>
<td><strong>PROTEIN</strong></td>
<td>6.7g/dl</td>
<td>6.8g/dl</td>
<td>6.0-8.5g/dl</td>
</tr>
</tbody>
</table>

* BUN will fluctuate only 2 mg/dl in a healthy person.
** BUN/CREAT RATIO will fluctuate only 1.2 in a healthy person.

In general, the subject's sodium, potassium, chloride, and protein were normal throughout the study. However, the subject's BUN and BUN/CREAT were low or on the low side of what is considered normal by the medical profession during Baseline. After Phase 1, the subject's BUN and BUN/CREAT increased from a below-normal range to a
level that would be associated with a healthy person who was eating a balanced meal.

The third factor that may indicate some improvement is shown in the results of the Self Perception Inventory Test (SPI). Table 3 represents the Pre-Self Perception Inventory Test given in the Baseline phase, and the Post-Self Perception Inventory Test given in Phase 1 of the study.

Table 4
Self Perception Inventory Test Results

<table>
<thead>
<tr>
<th></th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Mean*</th>
<th>(+)(-)Mean**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncommon Response (UR)</td>
<td>2.0</td>
<td>2.0</td>
<td>.57</td>
<td>0</td>
</tr>
<tr>
<td>Consistency (C)</td>
<td>15.00</td>
<td>16.00</td>
<td>18.57</td>
<td>1.0+</td>
</tr>
<tr>
<td>Self Actualization (SA)</td>
<td>16.00</td>
<td>18.00</td>
<td>21.56</td>
<td>2.0+</td>
</tr>
<tr>
<td>Supervision (SV)</td>
<td>30.00</td>
<td>35.00</td>
<td>39.11</td>
<td>5.0+</td>
</tr>
<tr>
<td>Rigidity Dogmatism (RD)</td>
<td>2.00</td>
<td>2.00</td>
<td>2.24</td>
<td>0</td>
</tr>
<tr>
<td>Authoritarianism (AU)</td>
<td>6.00</td>
<td>5.00</td>
<td>4.56</td>
<td>1.0+</td>
</tr>
<tr>
<td>Anxiety (AX)</td>
<td>11.00</td>
<td>9.00</td>
<td>4.80</td>
<td>2.0+</td>
</tr>
<tr>
<td>Depression (DP)</td>
<td>15.00</td>
<td>13.00</td>
<td>5.02</td>
<td>2.0+</td>
</tr>
<tr>
<td>Paranoia (PA)</td>
<td>6.00</td>
<td>6.00</td>
<td>5.78</td>
<td>0</td>
</tr>
<tr>
<td>General Adjustment (GA)</td>
<td>61.00</td>
<td>69.00</td>
<td>79.24</td>
<td>8.0+</td>
</tr>
</tbody>
</table>
Table 4-continued

<table>
<thead>
<tr>
<th>General Maladjustment (GM)</th>
<th>Pre-Test</th>
<th>Post-Test</th>
<th>Mean*</th>
<th>(+)(-)Mean**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>42.00</td>
<td>37.00</td>
<td>22.98</td>
<td>5.0+</td>
</tr>
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</table>

Pre-Test was administered during Pre-baseline and Post-Test was administered at the end of phase one.

*Average scores, normal for the subject's age and education.

**Scores closer to the mean indicates improvement. (+'s) indicates the positive amount in which the Post-Test differed from the Pre-Test in relationship to the mean.

In general the score of the SPI given during Phase 1 indicated that the subject appeared to be under less anxiety and was less depressed in relationship to the initial SPI given in Baseline. In comparing the Baseline SPI to the Phase 1 SPI, there is a general trend towards increasing score from a range that would be considered sub-normal, for the subject's age and education, to a level of normal range.
CHAPTER IV

DISCUSSION

In dealing with individual subjects suffering from bulimia, it could be concluded that intervention should be targeted toward two factors of the subject's behavior. First, the subject must regain some control over eating. This was apparently done in Phase 1 by instructing the subject to eat a controlled calorie intake by following a preplanned program. The second factor is to correct the subject's misconception about body image and weight control. This was apparently done in Phase 1 by having the subject read and discuss relevant literature. It was this literature that led the subject to reevaluate the concept of what is normal body weight. Once the subject was confronted with the truth about body weight and image, there was no longer a logical foundation on which to build the misconception. The misconception that the subject previously had was replaced by correct conceptions.

When one reviews the data depicted on the graph in Figure I., it appears that there is a difference between the data in Pre-baseline and Baseline. This variation may be explained in several ways. First, as was stated earlier, a bulimic tends to under-record the incidents of binges and vomits. Because of this tendency, data may not be recorded accurately in the early part of data collect-
ion which may lead to unusual looking or unstable data. Another reason for the variability may be due to the effect of the first day of data collection. As the graph depicts, calorie consumption was extreme; this may have forced the subject to underscore the remaining days. However, as rapport is built between the subject and the therapist, data collection may become more accurate as data collection continues.

A unique factor about this study was the way in which food consumption and vomiting were validated. Studies have shown that electrolyte imbalances are common among subjects with bulimia (Mitchell et al., 1983, and Ramos, Hall-Craggs, and Demers, 1980). In this study the subject showed poor electrolyte levels as indicated by low BUN and BUN/CREAT prior to treatment. The electrolyte imbalances are due to poor temporal eating patterns, which are complicated by eating food with little protein and consistent vomiting (Ramos et al., 1980). As the subject regained some control over eating and began to eat some high protein food during Phase 1, the electrolytes began to improve. If the subject had reported following the diet plan, but the electrolytes did not improve, the data could be considered false.

The type of design that was used in this study was an AB design with a Pre-baseline phase, which was used as a training period. This type of design was used due to the fact that it would be unethical to use any other design that would allow the bulimic behavior to recur for the
purpose of evaluating the treatment program.

It is apparent that bulimic behavior is on an increase among adolescents and college age women. This may be due to the ideal, presented by T.V. ads, that the thinner you are, the more likely your chances are of being accepted by others. As this behavior increases, new ways of accurately recording this semi-private behavior is needed. One possibility is the use of electrolytes, due to the high correlation between vomiting and poor electrolytes. As vomiting increases, the electrolytes may become abnormal. Whereas, if the vomiting behavior decreases, the electrolytes will return to a normal range. Until society changes its ideals on thinness, bulimia and other eating disorders will remain common among adolescent and college age women.
APPENDIX A

Incident Recording Sheet (1)
RECORD TYPE AND AMOUNT OF FOOD CONSUMED

DATE: ___________ # OF BINGES: _______ # OF VOMITUS: _______

RECORD TYPE AND AMOUNT OF FOOD CONSUMED

DATE: ___________ # OF BINGES: _______ # OF VOMITUS: _______
APPENDIX B

Bibliographical Data Sheet
Name: ___________________________ Date: ____________

Sex: _______ Age: _______ SSN: ____________________________

Present Address: ___________________________ City: ___________

State: ___________________________ Zip: __________________________

Phone: ___________________________

Height: ___________________________ Weight: __________________________

Why are you seeking help: ____________________________

How long have you been a bulimic: ____________________________

Do you vomit (if so how many times a day): ____________________________

Do you use laxatives (if so how many per day): ____________________________

Do you feel that you are overweight: ____________________________

Do you have a fear of becoming overweight: ____________________________

Do you feel that vomiting and/or laxatives are a way of controlling your weight: ____________________________

Where and when do you do most of your binging: ____________________________

What types of food do you binge on: ____________________________

Why do you stop binging: ____________________________
Do you have pain after binging:

How long do your binges usually last:

How and why did you become a bulimic:

Do your parents know that you are a bulimic:

Do you live with both parents:
if not, which parent do you live with:

Do you have any brothers or sisters:
if so list name and age of each:

Do you use drugs on a regular basis:
if so, what kinds:

Are you on any medication:
if so, what kinds:

Are you depressed:
If so, why:

Briefly explain your diet history, including any weight fluctuation:

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<table>
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<tr>
<th></th>
<th>Meat</th>
<th>Bread</th>
<th>Milk</th>
<th>Veg</th>
<th>Fruit</th>
<th>Fat</th>
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<tr>
<td><strong>M</strong></td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tbody>
</table>

**Afternoon**

|       | +    | +     | +    |    |       | +   |
|       | +    | +     | +    | +  |       | +   |
|       | +    | +     | +    |    | +     | +   |
|       |       |       |     | +  |       | +   |

**Evening**

|       | +    | +     | +    |    |       | +   |
|       | +    | +     | +    | +  |       | +   |
|       | +    | +     | +    |    | +     | +   |
|       |       |       |     | +  |       | +   |

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APPENDIX D

Contingency Contract
Contingency Contract

Effective date: ________________ Contract number: ________________

We, the undersigned parties, agree to preform the following behavior:

I __________________________ will record the following behavior throughout the study: 1. Number of binges per day. 2. Number of vomitus per day. 3. Types and amounts of food eaten per day. I will receive 2 points per day, if I complete these tasks daily. If I fail to complete these tasks I will lose 5 points for each day missed. At a given time, in the study, I will follow a diet that has been designed for me. If I follow this diet I will receive 5 points per day. If I do not follow this diet I will lose 15 points per day. During the time in which I am following my diet, I must read a paper that is presented to me, at a rate of one per day. For this I will receive 5 points. If I fail to read this paper, I will lose 15 points. I will also take a number of electrolyte tests during this study. I will receive 20 points for each test taken. If I refuse to take an electrolyte test, I will lose 40 points. The electrolyte tests will be used to insure that the diet is being followed. If I show an improvement in my electrolytes, I will receive 20 points. If I do not show an improvement in my electrolytes, I will lose 30 points. All points that are earned or lost will be applied to my money being paid back to me at the end of the study.

Pay back plan: If I earn 95% to 100% of all total points, I will receive 100% of my money back. If I earn 90% to 94.99% of all total points, I will receive 75% of my money back. If I earn 85% to 89.99% of all total points, I will receive 50% of my money back. If I earn 80% to 84.99% of all total points, I will receive 25% of my money back. If I earn less then 79.99% of all total points, I will forfeit all my money.

I __________________________ will supply ____________ dollars for the study. I understand that in order for me to receive my money back, I must follow the contract. I also understand that I may not get back the full amount of money I paid in, due to the fact that I did not earn enough points during the study. However, if other than extreme conditions prevent me from completing this contract, I will forfeit all my money.

____________________________ date Tim L. Vander Molen date

Client's name
APPENDIX E

Informed Consent Form
Informed Consent

I ____________________________ am willing to participate in the bulimic study which is being conducted by Tim L. Vander Molen, graduate student in psychology, under the supervision of Roger Ulrich Ph.D. It has been fully explained to me the potential risks and benefits of this study and I am freely submitting to the study. I also understand that I may withdraw from this study at any time.

I understand that this study will use a contingency contract that will involve positive reinforcement (money) and response cost, as well as relevant reading into bulimia. It was also explained to me that all records will be kept confidential and can not be released without my written consent.

_________________________ Date  _______________ Date
Client's name                          Tim L. Vander Molen
APPENDIX F

Metropolitan Height and Weight Tables
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<th>HEIGHT FEET INCHES</th>
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<th>WOMEN</th>
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<td>MEDIUM FRAME</td>
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