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**Individual Behavioral and
Cognitive-Behavioral Interventions
for Lifestyle Change: Case Studies**

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Degree
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To the participants in this research project, whose desire for better health made this research project possible.

DEDICATION

To Mom and Dad, whose love, support, and sacrifice made
my educational journey possible. Thank you.

Abstract

The purpose of this study was to assist the subjects in developing positive lifestyle change for weight control via behavioral and cognitive-behavioral interventions. In addition, this study explored the effectiveness of individualized self-management programs, which emphasized both proper nutrition and exercise for weight control. Subjects ($N = 9$) for the present study were solicited from an announcement made at a corporate fitness center regarding the beginning of a weight control program. The investigation utilized a preprogram interview; the pre- and postprogram administrations of: (a) the Commitment to Physical Activity Scale (Corbin, Neilson, Bordsdorf & Laurie, 1987), CPA; (b) the Body Image Distortion Questionnaire (Mable, Balance & Galgan, 1986), BIDQ; (c) the Physical Self-Perception Profile and Perceived Importance Profile (Fox & Corbin, 1989), PSPP, PIP; (d) an exercise adherence questionnaire (Corbin & Lindsey, 1994), (e) pre- and postprogram fitness assessments; and a postprogram evaluation survey.

BIDQ and PSPP results suggested that many of the subjects improved in the amount of body image distortion and self-esteem levels with either behavioral or cognitive-behavioral interventions. However, those subjects that reported frequent use of cognitive-behavioral techniques, i.e., cognitive restructuring, reflected greater reductions in distortion levels and lower discrepancy scores associated with global self-esteem.

CPA and exercise adherence questionnaire results indicated many of the subjects had elevated adherence factor ratings and a higher level of motivation to exercise. This resulted from either behavioral or cognitive-behavioral interventions.

Postprogram survey responses suggested that the subjects valued and supported program individualization. Gaining and understanding basic exercise and nutrition knowledge proved to be a powerful tool, aiding the subjects in increasing their sense of control over their personal program. Subjects also preferred gradual, positive lifestyle changes rather than "quick" and expensive diet programs.

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Chapter 1

Introduction

Many programs exist today to help people improve how they look and feel. Despite the exercise craze in the 1970's, thousands of Americans do not possess healthy exercise and dietary habits (Corbin & Lindsey, 1994). The media have not helped this matter by equating beauty with exceptional thinness. People, especially women, have begun to accept that they are not a part of, or never will be a part of this new norm. The result is a growing number of unfit and unhappy people, who want to get thin quick.

The public is bombarded with information about weight loss from both print and electronic media. Many programs promise "quick" results and use "before" and "after" testimonials of consumers who have reportedly achieved great success from their product. Over the years, these programs have left customers unsatisfied and often in worse physical condition than before joining a program. There must be a better way for consumers to regain control over their behaviors, and

to gain the understanding that rebuilding a healthy life-style takes time and a little effort.

In reviewing the literature in this area, one can conclude that weight and exercise behaviors are multidimensional constructs that respond best to a multidimensional paradigm of intervention therapy. The amount of exercise in which one participates is not always a direct reflection of activity enjoyment. Results from several studies on exercise behavior and body image satisfaction indicate that some frequent exercisers exhibit greater amounts of dissatisfaction with their body shape than moderate exercisers (Melnick & Mookerjee, 1991; Imm & Pruitt, 1991; and Davis & Cowles, 1991). This may seem illogical since these same studies have shown improvement in physical health. Behaviors like these are considered addictive by some experts (Imm & Pruitt, 1991).

Self-efficacy plays an important role in goal setting and producing changes in exercise behaviors. The participant can feel empowered with a gain in perceived control (Poug & McAuley, 1992). Self-efficacy measures can become valuable predictors

and screening items which help the consultant structure individual interventions.

The question of which treatments will produce the most optimal results is open to debate.

Cognitive-behaviorally based programs appear to offer the most promising results (Dishman, in press).

However, the literature is lacking in research conducted on methods of individually based intervention.

1. Purpose

The purpose of the present study was to assess the effectiveness of behavioral and cognitive-behavioral interventions on present life-style patterns and behavior change in an individualized weight control program.

Subproblems

Subproblem 1. The first subproblem to be studied includes identifying changes in body image and self-esteem scores as a result of behavioral and cognitive behavioral interventions.

Subproblem 2. The second subproblem studied includes identifying changes in motivation and adherence levels as a result of behavioral and cognitive behavioral interventions.

Subproblem 3. The third subproblem attempted to identify subjects' positive lifestyle affect produced by program individualization.

2. Definition of Terms

One aspect of program success is **adherence** of the participants to the recommended interventions. Willis & Campbell (1992) defined adherence as conforming to a certain standard of behavior in order to meet some goal. Adherence in this program was measured by an exercise adherence questionnaire (Corbin & Lindsey, 1994), as well as by participation and active involvement.

Body image is known as the perceptions and evaluations one has of their body (Willis & Campbell, 1992). In the present study, body image, or the self-concept an individual possesses of his or her body

size was measured by the Body Image Distortion Questionnaire (Mable, Balance & Galgan, 1986). This was administered prior to the individual's fitness test so the results of percent body fat would not affect their response.

Commitment, as measured by the Commitment to Physical Activity Scale (Corbin, Nielson, Bordsdorf & Laurie, 1987) determines one's commitment to physical activity through motivation to participate in the broad domain of sport and exercise.

Self-Esteem is one's perceived level of confidence, ability, and self-worth. The domain of physical self-worth and confidence was measured by the Physical Self-Perception Profile (Fox & Corbin, 1989) which assesses one's self-worth in relation to physical aspects such as sport, body, strength, condition, and physical self-worth.

As stated earlier, the interventions to be administered in this study were of both a behavioral and cognitive-behavioral nature. In the broad sense, behavior modification focused on the relationship between a behavior and its results or consequences.

These principles provided a systematic approach to change behaviors through either positive or negative reinforcement. Punishment, or response cost, were not applied in this program.

The two main **Behavioral Based Interventions** included: (a) goal setting techniques, and (b) contingency management through a behavioral contract. **Goal setting** is reaching a specified standard within a specified time frame to regulate behavior toward the target (desired) behavior. Each subject was encouraged to focus more on short-term, or process oriented goals, rather than long-term outcome oriented goals. The process of **contingency management** attempts to increase the frequency of the desired behavior by manipulating the consequences. Contracting was the form of contingency management used in this study. The contract outlined specific expectations, goals, time frames of completion, and the positive rewards to be gained upon goal attainment.

The other method available included techniques of **Cognitive-Behavioral Interventions**. **Positive Self-Talk** emphasizes the importance of identifying and modifying

self-statements and to restructure or replace self-defeating thoughts. The general design of this program revolved around the notion of self-management to produce life-style changes. **Self-management** teaches one how to focus on behavior through self-monitoring. In **Self-evaluation**, the subject learned to compare their actual behavior with both previous or present perceived beliefs. **Self-reinforcement** emerged when subjects realized their achievements as a result of this evaluation, or that the two were not similar and further actions were necessary to help the subject equalize the two behaviors. **Thought-stopping techniques** were applicable in this situation. This process facilitated education of the subjects in methods that helped them recognize self-defeating thoughts, stopping the thoughts when they occurred, and replacing them with more positive self-statements. **Relaxation techniques** enabled the subject to recognize muscular tension and initiate methods to reduce distress. **Visualization** allowed the subject to modify existing beliefs through efficacy enhancing imagery. Visualization was also used to simulate high risk

situations and develop a plan of action. The final cognitive-behavioral method of intervention was **relapse prevention**. This attempted to reduce the abstinence violation effect. The abstinence violation effect occurred when perceived loss of control triggered a belief that once abstinence was broken, total relapse was certain.

3. Delimitations

There were several delimitations regarding this study. Due to the selection of the case study design, it was decided that statistical analyses would not be applied to any of the data. In addition, the case study approach resulted in the selection of a small number of subjects to be directed and monitored. It was assumed that the subjects would be truthful in reporting dietary and exercise logs to the researcher.

Since there were no control or single treatment groups, it was difficult to determine if changes occurred due to simple behavior intervention or if the changes were a result of the cognitive-behavior interventions. However, it was likely that such a design would have a positive impact and that produced

the changes in behavior desired by these individuals. The program emphasized individuality in both prescription and monitoring, but encouraged enlistment of social support and reinforcement upon goal attainment.

4. Significance of the Study

The psychological factors of body image, self-esteem, and commitment/motivation analyzed in this study were discovered to be important factors that should be integrated into weight control programs. The scientific knowledge exists on the physiological determinants of weight loss. Subjects in this study gained working knowledge of exercise and nutrition as well as self-management techniques to achieve and maintain healthy lifestyles. The program was designed to educate the subjects in these aforementioned techniques, thus allowing them to integrate these methods into a personalized program that aided them in reaching their desired behaviors. Because it was based on self-management, the subjects would be able to install a similar program if, indeed, a relapse does occur in the future.

Chapter 2

Review of Literature

The literature reviewed identified the underlying theoretical frameworks that influenced this researcher and thus the research itself. Specifically, the review was organized into the following sections : (a) body image, (b) self-efficacy, (c) behavioral versus cognitive based programs, and (d) cognitive-behavioral based programs.

1. Body Image

A vast amount of literature exists on the relative effects of participating in regular physical activity and changes in body image. Such activity can produce beneficial improvement in both physical and psychological health. A simple exercise prescription can lower blood pressure, reduce the risk of developing coronary heart diseases, strokes, diabetes as well as alter body composition (Fox, Bowers & Foss, 1989; Corbin & Lindsey, 1994). These physical improvements also have a powerful effect on a person's psychological

"fitness". In recent years, studies have shown links between exercise and improvement in areas of self-efficacy (Marcus, 1992; Poug & McAuley, 1992), and body image (Melnick & Mookerjee, 1991; Kirkcaldy & Shephard, 1990). One topic appearing often in exercise psychology literature involves issues of weight control programs and their effectiveness.

Many problems currently exist in the attempts made to evaluate the benefits of exercise (Kirkcaldy & Shephard, 1990). Kirkcaldy and Shephard point out many variables that could potentially produce errors in research data, for example: (a) issues of sampling techniques, (b) personal reactions to the program, (c) compliance of the subjects, and (d) defining the terms of exercise. Other important areas often tested along with exercise belong in the psychological realm. Problems associated with this can arise from the type of scale used to measure the behavior. Kirkcaldy and Shephard (1990) reminded us that many scales are old, were developed for a certain age group, or are simply unable to detect gradual changes in psychological health.

Some specific responses to exercise reported in this paper (Kirkcaldy & Shephard, 1990) include physiological and psychological affects. Influences of mood state on fatigue and body image, increases in social contacts, self-efficacy, and positive expectations, as well as decreases in stress levels, distractions and trait/state anxiety scores, all appear to be positive gains from exercise participation. At this point, it is suggested that one must weigh these benefits against potential risks involved in exercise when dealing with a subject group. Personal commitment, time, money, and injuries are some of the more common concerns to screen for in the initial assessment. However, several other less obvious risks can surface. Negative addiction may develop from compulsiveness. Neurotic behaviors from even one subject could produce intragroup mood disturbances and spread unwilling attitudes to commit (Kirkcaldy & Shephard, 1990).

Several studies have reported effects from specific types of training or exercise. One study by Melnick and Mookerjee (1991) examined the possible effects of

advanced weight training on body cathexis and self-esteem. It was hypothesized that, at the end of the training period (16 weeks), the trained subjects would show improvement in two areas, body cathexis and self-esteem. Subjects were 27 college age ($M = 23.6$ years) in an advanced weight training course. This group trained three times each week (3 hours) for a period of 16 weeks. The control group consisted of 30 college students in a physiological perspectives course which met twice a week for the same 16 weeks. Both classes were taught by the same instructor (Melnick & Mookerjee, 1991).

Tests used in the procedure of data collection included two questionnaires that were to be completed by both groups in the second and sixteenth weeks of the study. The first questionnaire, the Steinberg Self-Esteem Scale (SES) consisted of 10 items measuring self-esteem. A lower score reflected a higher level of self-esteem (Melnick & Mookerjee, 1991). The second measure, Secord and Jourard's Body-Cathexis Scale, consisted of 46 items designed to evaluate subjects' perceived body satisfaction. A higher score on this

scale reflected the subject's high level of satisfaction he/she feels about their body parts. The trained group was also measured in the third and sixteenth weeks for strength, body composition, endurance, and flexibility.

Scores on the Steinberg SES prior to the program indicated no significant differences existing between groups. Post program analysis revealed significant changes in favor of the trained group ($t = -3.15$, $p < .05$). Intragroup analysis revealed no significant changes among each group's members (Melnick & Mookerjee, 1991). The Body-Cathexis Scale results indicated that at the pretest, both groups were similarly satisfied with their body parts. Posttreatment results indicated significant differences in favor of the trained group ($t = 3.58$, $p < .05$). Again, there were no significant differences found within the control group at pre- and posttest measures (Melnick & Mookerjee, 1991). Female trainers showed individual significant losses in percent body fat, but there was no significant change for the group (Melnick & Mookerjee, 1991).

Another study dealing with the issues related to body image examined relationships and comparisons between active men and women (Davis & Cowles, 1991). The purposes of this study were: (a) to look for comparisons along a broad age range; and (b) to attempt to find connections among gender, age, and other variables such as body image, diet, weight and degree of participation. The subjects were recruited through advertisements at the university and various fitness clubs in metro Toronto. These subjects identified themselves as regular exercisers who were enrolled in structured classes or followed a self-styled program. The female subjects ranged in age from 14-58 years old ($M = 23.5$ years) and the male subjects ranged in age from 14-64 years old ($M = 28.45$ years) (Davis & Cowles, 1991).

The Lifestyle Questionnaire was administered to assess attitudes and behaviors related to diet, nutrition and physical activity. Body image and self-esteem were surveyed on three scales, all of which were used as dependent variables. First, subjects were asked to rank body focus on a six point scale to

clarify the importance of the way they feel about their body compared to the way they feel about themselves in general (Davis & Cowles, 1991). Body dissatisfaction was measured on a five point scale in which the subjects were asked to rank how they felt about 11 different body parts. The sum of these scores was the direct perceived measure of personal dissatisfaction; a high score indicated high dissatisfaction (Davis & Cowles, 1991). A final measure of body image dealt with desired weight. Subjects were asked to indicate on a five point scale the relationship of their weight at present time relative to their desired weight. Dieting behavior was assessed simply by asking the subjects if they did indeed want to lose weight. A four site skinfold measure indicated each participant's percent body fat, and body mass index (BMI) was also assessed for each subject using the following equation: $[BMI = \text{weight}(\text{kg}) / \text{height}(\text{m}^2)]$ (Davis & Cowles, 1991).

MANOVA results indicated that age had no significant affect on weight satisfaction in females who wanted to lose weight ($M = 1.32$, $p = .251$). There

was also a nonsignificant age affect on women who wanted to gain weight ($\bar{M} = 1.29$, $p = .524$). However, age did prove to have a significant influence on men's desire to gain weight ($\bar{M} = 7.46$, $p = .006$) as well as in men who wanted to lose weight ($\bar{M} = 6.51$, $p = .011$) (Davis & Cowles, 1991). Both sex and age factors influences revealed that age had no effect on women's perception of current versus desired weight. Body dissatisfaction significantly correlated with desired weight in both younger (< 25 years.) and older (> 25 years) subjects ($p = .0002$). Body dissatisfaction also significantly correlated with body focus in younger subjects ($p = .0001$) (Davis & Cowles, 1991).

A similar study by Imm and Pruitt (1991) found results that resemble those found by Davis and Cowles (1991). The purpose of this study was to investigate the relationship existing between high frequency female exercisers and body shape satisfaction in non-eating disordered subjects. Imm and Pruitt (1991) hypothesized that those females who have "normal" percent body fat, but exceed the ACSM recommended amount of exercise, would be more dissatisfied with

their body shape. This reasoning developed from the thought that these exercisers would have a more negative view of their body than moderate or nonexercisers. A visible behavior of this dissatisfaction is an almost "addictive" adherence to their exercise routine (Imm & Pruitt, 1991).

For this study, exercising subjects were recruited from a local spa. Nonexercisers were volunteers in an introductory psychology class. High frequency subjects were defined as exercising 6 or more hours each week ($n = 28$). Moderate subjects were defined as those who exercised 3-4 hours each week ($n = 26$) (Imm & Pruitt, 1991). There were 20 subjects in the nonexercise group. Three measures were administered to determine exercise habits, dissatisfaction and eating patterns. The Eating Attitudes Test was used as a screening instrument in the initial evaluation to filter out those with eating disorders. The Body Shape Questionnaire (BSQ), a 34 item self-report test, was given to the subjects to assess experience of "feeling fat". The Exercise Inventory (EXIT) contained 43 self-report items designed by the experimenter to

assess exercise habits and attitudes about exercise. Volunteers received a battery of these self-report items. Those who returned the battery and met all criteria were weighed and measured for percent body fat (Imm & Pruitt, 1991).

High frequency exercisers reported a mean of 8.8 hours of exercise each week. Moderate subjects reported $M = 3.5$ hours of exercise each week. A one-way ANOVA revealed significant differences between the three groups in satisfaction ratings. The high frequency group was more dissatisfied ($M = 115.93$) than the moderate exercise group ($M = 80.38$) with $t(71) = 4.90$, $p < .0005$. The high frequency group was also more dissatisfied than nonexercisers ($M = 93.85$, $t(71) = 2.83$, $p < .006$). No significant differences were found between the moderate and nonexercise groups (Imm & Pruitt, 1991). Subjects were asked to rank on a six point Likert scale how often they would exercise with a cold or other illness. As predicted, high frequency subjects were more likely to exhibit addictive characteristics by exercising with a cold ($M = 4.9$; $t = 4.03$, $p < .005$) or other illnesses ($M = 4.2$; $t = 3.35$, $p < .001$) (Imm & Pruitt, 1991). Subjects were instructed

to rank order five reasons for exercising. The high frequency group reported that they were more likely to exercise to burn fat ($z = 2.28$, $p < .02$) (Imm & Pruitt, 1991). The researchers suggested that these findings were a direct result of a culture who promotes thinness as attractiveness. Imm and Pruitt (1991) proposed "being dissatisfied with one's shape appears to have become almost a cultural norm for women, a phenomena called "normative discontent".

Perceived barriers reported to most frequently limit exercise participation are: (a) lack of time, (b) lack of willpower, and (c) time constraints (Johnson, Corrigan, Dubbert & Gramling, 1990). Other barriers are more internally oriented and mirror anxiety of social physique. For some people, being present in social exercise settings produces a fear that others are evaluating their body. Such behavior is often referred to as social physique anxiety (Johnson et al., 1990).

A study done by Spink (1992) examined the relationship of social physique anxiety to location of exercise participation. Subjects for this study were

37 female nursing students age 17-19. These subjects were asked whether they exercised, and where they typically performed the exercise routine. Public participation was defined as exercising in a fitness club, community center or university facility. Private exercise was defined as exercise done at home (Spink, 1992).

Using a mean split to determine group parameters, the subjects were placed in one of two groups depending upon whether the subject claimed to be either a public or private exerciser. Subjects scoring 38 or more were placed in the high group ($n = 19$, $M = 43.9$). Those who scored 37 or below were placed in the low group ($n = 18$, $M = 31.3$). Analysis of these groups proved to show that these differences were significant ($t(35) = -8.34$, $p < .001$) (Spink, 1992). A chi-square test was used to estimate fit between observed and expected frequencies of participation. The low group yielded a private frequency of 22.2% and a public frequency of 77.8% ($p < .05$). The high group yielded a private score of 47.4% and public score of 52.6%; $M = 5.5$, $p < .02$. These findings support the hypothesis that

high scorers would typically prefer to exercise more in private locations and less in public than would be expected (Spink, 1992).

Each subject was weighed to determine if that variable was related to high and low social physique anxiety. High scorers weighed $\bar{M} = 64.5\text{kg}$, while low scorers weighed $\bar{M} = 58.6\text{kg}$. A t-test revealed a calculated value of -2.46 , $p < .05$ (Spink, 1992). These findings insinuate positive effects from possessing a low level of physique anxiety. Perhaps interventions involving restructuring can shift the perceived, almost narcissistic focus from self to other more relevant factors (Spink, 1992).

2. Self-Efficacy

The Weight Efficacy Life-Style Questionnaire (WEL) was developed to aid researchers and practitioners evaluate self-efficacy of clients in obesity treatment (Clark, Abrams, Niaura, Eaton & Rossi, 1991).

The 20 item WEL consists of five situational factors; i.e., Negative Emotions, Availability, Social Pressure, Physical Discomfort and Positive Activities. The sample ($N = 162$) was derived from obese patients in a

14-session behavioral weight loss program. The sample was 91% female with a mean age of 40.8 years, and who averaged 30.8% overweight for their height and frame size. Chronbach's alpha coefficients of internal consistency ranged from .70 for the Positive Attitudes scale to .90 for the Social Pressure scale. The final WEL form was administered to 38 obese diabetic subjects which were recruited through a public announcement. These subjects were 54% female with a mean age of 55.4 years and averaged 32.7% overweight for their height and frame size. Subjects were randomly assigned to either a self-help group, or a 17 session intensive program.

The intensive treatment group received information on nutrition, medical conditions, self-monitoring of blood glucose procedures and a 20 minute period of exercise for each two hour session. Behavioral strategies such as eating cues, stimulus control, cognitive restructuring, and relapse prevention were also covered through training and instructional manuals. The subjects were found to have dropped from 32.7% to 29.4% overweight at the end of treatment (Clark et al., 1991).

The second treatment sample ($N = 21$) combined the Optifast diet with behavior therapy. Initial questions prior to treatment covered information on previous attempts, current eating habits, social history, employment, social support system, relationships, motivation for weight loss, weight goal, expectations, and willingness to make life-style changes (Clark et al., 1991). This same treatment group also differed in some of the cognitive-behavioral strategies used. These subjects received training in stimulus control, problem solving, stress management, goal setting, level of healthy eating habits, assertiveness training, facilitation of social support, relapse prevention and cognitive restructuring. This group dropped from 71.1% overweight at pretreatment to 33.6% overweight at posttreatment (Clark et al., 1991). The WEL reported sound psychometric properties and is sensitive to treatment changes. This measure would be useful as a general screening tool to assess a client's readiness to implement behavior change and coping skills (Clark et al., 1991).

Other studies have examined the effects of self-efficacy on exercise behaviors. One in particular by Poag and McAuley (1992) suggested that goal setting produced desired target behavior when goal efficacy was emphasized along with exercise efficacy. By concentrating on the importance of careful goal setting (and the possibility of goal achievement becoming a reinforcing motivator) a client had the ability to create realistic, positive outcome expectancies and eventually these patterns evolved into salient traits.

The matter of using self-efficacy to change exercise behavior has been dependent upon the client's present stage of exercise change. In the paper by Marcus, Selby, Niaura, and Rossi (1992), self-efficacy measures were compared with 5 possible stages of change, (a) Precontemplation, (b) Contemplation, (c) Preparation, (d) Action and (e) Maintenance. The study found that those subjects in the Precontemplation stage had the lowest scores on the self-efficacy measure. Results also revealed that 61% of the subjects who relapsed were classified into the Precontemplation stage (Marcus et al., 1992).

One study by Lewis, Blair and Booth (1992) analyzed the outcome of group therapy for emotions related to body image and weight-control self-efficacy. This study examined four groups of subjects. In groups 1 and 2 ($n = 6$ for each group) the subjects were all women who had been referred to the Psychology Department at New Cross Hospital for a variety of weight related problems. These subjects ranged in age from 19-51 years old ($\bar{X} = 31$). Groups 3 and 4 were composed of women who responded to publicity about research dealing with issues of weight control in the School of Psychology at the University of Birmingham. These subjects' ages ranged from 24-48 years old ($\bar{M} = 38$). Clients in all groups were given information on potential methods that would modify their current eating patterns. Subjects were encouraged to make these changes instead of "going on a diet" (Lewis et al., 1992).

Therapy for each group lasted 8 weeks with a 90 minute session each week. Sessions 1 and 2 were informative, training the subjects in basic nutritional and exercise education as well as some behavioral

strategies. Sessions 3 and 4 were conducted from a cognitive therapeutic approach. These sessions included discussions concerning emotional overeating and binge eating. Assertion training was introduced in sessions 5 and 6. This training was intended to improve effectiveness of treatment. The final 2 sessions covered common reasons for dieting and attitudes toward female appearance. A comprehensive questionnaire was administered three times throughout the program, first at pregroup session, then at post group session and lastly at the end of 6 months of maintenance. The questionnaire consisted of self-constructs represented by items (n) of self-esteem (4), weight-control self-efficacy (2), assertiveness (4), perceived social support (3), perceived body size (6), desire to eat for emotional reasons (5), actual emotional eating (5) and temptation to eat by external cues (2). Chronbach's alpha for these components ranged from .58 for self-efficacy to .90 for temptation (Lewis et al., 1992). Body mass index (BMI) and waist/hip ratios were also measured.

Results revealed no difference between self-referred and general practitioner (GP) referred groups prior to treatment sessions. BMI differed between type of referral during treatment, with self-referred losing more weight than GP referred (Lewis et al., 1992). Both groups decreased in desire to eat in response to emotional arousal and external cues. Both groups also reported lower scores in perceived body size and moderate weight reduction. BMI calculations also improved with both types of treatment. Lewis et al. (1992), concluded long-term maintenance of weight reduction became more attainable when interfering elements (emotions and attitudes) were brought under control by the client.

3. Behavioral versus Cognitive Based Programs

The article by Abrams and Follick (1983) examined behavioral weight loss interventions at the worksite (Abrams & Follick, 1983). Subjects ($N = 133$) ranged in age from 20-60 years old, were assessed to be between 10-64% overweight and 91% of them were nurses. Treatment included weekly weigh-ins, group meetings,

self-monitoring records and a pretreatment medical screening. The behavior modification program consisted of 10 sessions on 8 topics. The first two sessions were devoted to explanation of the energy-balance model and self-monitoring of caloric intake and expenditure. The next two sessions focused on stimulus control. There was one session devoted to each of the following: (a) nutrition, (b) goal setting, (c) cognitive restructuring, (d) contingency management, (e) exercise, and (f) enlisting social support from others in treatment. Subjects were all asked to make a public commitment by wearing buttons that read "I'm doing it". The subjects were randomly assigned to one of three groups whose initial treatments were the same, but they differed in maintenance training (Abrams & Follick, 1983). One group held peer group discussions. The other two groups received further behavioral skills training generalized for weight loss maintenance.

Four components in the advanced training groups included diary fading. The self-monitoring process of external record keeping was structured to evolve into internalized monitoring with reinstitution of external

monitoring if relapse occurred. This fade out process was to be complete by the end of 4 weeks. Structured problem solving was another component covered in which the subjects were taught how to be their own therapist in the light of potential lapse, what to change and how to change it (Abrams & Follick, 1983). A third component involved a programmed relapse-prevention exercise. On a planned day, subjects were instructed to deliberately overeat and record their feelings and thoughts during the "binge", and then to create plans to prevent the controlled lapse from becoming a full blown relapse. A buddy system was introduced to aid in social support. Behavioral contract forms were to be completed with one's buddy to set characteristics of targeted behavior (Abrams & Follick, 1983).

Attrition was reported quite high in this study with only 69 subjects completing the treatment phase of the program. A chi-square analysis using posttreatment attendance frequencies revealed differences between groups [chi-square (2) = 2.17, .5 > p > .3]. A 3x2 (groups * time) repeated measures ANOVA reported significant weight loss (4.4kg) with no difference

between groups [$F(2,66) = 3.2, p < .05$]. In regard to the maintenance phase, 34 completed all sessions.

ANOVA results of pre- and posttreatment and postmaintenance found a significant main effect for time [$F(2,62) = 6.3, p < .01$]. Abrams and Follick (1983) suggested that program failure, in relation to successful subjects, may "necessitate" attrition in order to save face.

More direct differences between cognitive and behavioral approaches were examined by Collins, Rothblum and Wilson (1986). The purpose of the study was to determine if efficacy levels in the two types of therapy greatly differed. Female subjects ($N = 60$) were obtained through an ad in the newspaper for long term weight reduction. Subjects were between the ages of 25-55 ($\bar{X} = 38$) and were found to be at least 10% above ideal body weight. The subjects were randomly assigned to one of four groups, 15 per group.

The study was designed so that each group received different treatment approaches; (a) cognitive (thoughts, beliefs), (b) behavioral (actions), and (c) cognitive-behavioral (combination of both), or (d)

nutrition and exercise only. Treatment sessions were 90 minutes long and continued for 8 weeks. The maintenance phase was scheduled to last 12 months past initial treatment. Assessments were conducted at pretreatment, posttreatment, 7 months and 12 months. An \$80.00 deposit was required by each subject to act as adherence reinforcement. Other arrangements were made for those who could not afford the deposit; therefore, no subjects were disqualified for monetary reasons. The money was returned in \$5 installments after each session they attended. Treatment consisted of learning and rehearsing weight reduction techniques, and self-report record keeping. Homework tasks were assigned each session. The sessions all consisted of a weigh in, a brief discussion and review of the previous week's lesson (experiences and reactions), presentation of new material, discussion of new material, homework assignments, and collection of homework from the previous week. At the end of each session, those who attended were given their \$5 for that week (Collins et al., 1986).

Cognitive treatment consisted of training the subjects to recognize negative thoughts, methods to increase self-control, ways to change the content of thoughts and images, cognitive restructuring, rational-emotive therapy, and elimination of self-defeating behavior (Collins et al., 1986). Behavioral treatment focused on the learning of self-monitoring and stimulus control techniques which were relevant to weight reduction. They were taught that overeating was a learned habit that can be changed, and how to decrease caloric intake and increase caloric expenditure. The cognitive-behavioral therapy group received both learning of new habits and methods of changing negative views of themselves in high risk situations. The nutrition/exercise only group served as a minimal treatment control group. Therapists served as facilitators of group discussions on nutrition, programmed and unprogrammed exercise (Collins et al., 1986).

The subject attrition rate was 22% at the end of treatment, accounting for 12 subjects to drop out, and 19% at the end of the maintenance phase, accounting for

another 9 subjects. A weight-reduction quotient $[(\text{lbs. lost} * 100) / \text{lbs over ideal weight}]$ revealed no significant differences among groups in mean weight at pre- and posttreatment tests (Collins et al., 1986). The behavioral group showed significant changes $[F(1,8) = 34.1, p < .001]$ in weight loss. The cognitive-behavioral group also revealed promising results with slightly significant differences in weight loss of that group's members $[F(1,8) = 3.6, p = .10]$ (Collins et al., 1992). The cognitive and control groups showed no significant differences in weight lost during the treatment and maintenance phases. From these findings, it was concluded that cognitive therapy alone cannot improve conditions for weight reduction, but that a multidimensional approach is most successful in this area of treatment (Collins et al., 1986).

A similar, but more detailed study by Clifford, Tan and Gorsuch (1991) tested the hypothesis that psychosocial mediating variables of self-motivation, life events, social support and coping style would correlate with behavioral health change measures. The groups of self-directed change (SDC) were divided into

group plus professional support, group plus peer support and group support only.

YMCA members ($N = 48$) picked one of three nights to meet each week. The type of treatment was randomly assigned to each group ($n = 12$ per group). An assessment only group served as the control group ($n = 12$). The treatment conditions for Group 1 focused on exercise adherence strategies and skills related to relapse prevention in sessions 1-4. Sessions 5-8 focused on nutritional and weight management skills. Sessions 9-13 dealt with stress management skills. Group 2 received identical training with each session, but in addition to these group sessions, each client planned five individual sessions with a randomly assigned therapist. Group 3 differed from group 2 in that, in the five additional sessions, each client met with a peer. The peers were paired according to their similarities in chosen method of exercise. These sessions were very poorly attended. The assessment only group received feedback on weight, body composition, cardiovascular fitness and blood pressure. All groups were given the same information as the assessment group

(Clifford et al., 1991)

Among the list of dependent variables tested in this study were measures of fitness appraisals, cognitive-behavioral factors, and behavioral health items. Height, weight, resting blood pressure, body composition (7 site skinfold) and a submax bicycle ergometer test to estimate max VO₂ ml/kg/min comprised the fitness appraisal.

Questionnaires were administered to assess cognitive-behavioral measures. These included: (a) Dishman's Self-Motivation Scale, used to assess self-motivation, which is a stable trait believed to be insensitive to situational influence (Clifford et al., 1991), and (b) Rosenbaum's Self-Control Schedule, used to measure self-control and a person's tendency to apply self-control as a means of solving behavioral risk problems. The State-Trait Anxiety Inventory was administered to assess general versus situational anxiety. A Health Risk Appraisal from the Center for Disease Control associated items on the test with the 12 leading causes for adult death and determines individuals "at risk" for certain health problems. The

final measure, a 12-item credibility and perceived success rating questionnaire was used to determine the client's perceived progress toward behavioral health objectives (Clifford et al., 1991).

Results from a MANOVA revealed no significant differences at pretreatment on dependent measures. At the end of the 8 week plan, the attrition rate was reported at 29% or 14 of 48 dropped out within 8 weeks (Clifford et al., 1991). Group 2 clients (therapist enhanced SDC) attended 70% of the individual sessions. Group 3 clients (peer enhanced SDC) attended only 10% of the scheduled sessions. Analyses among the groups of SDC support vs. the control group showed no significant differences in behavioral health changes. Significant improvement of all SDC groups was reported over the assessment only group. Average weight loss in the SDC groups was approximately 3.89kg (8.5 lbs) at posttreatment. SDC clients showed significant improvement in average gain of VO₂ from pre- to posttest results (M increase = 13%). Improvements in systolic and diastolic blood pressures ranged from no reduction (0/0) to more noticeable changes (23/8), a

significant difference across time ($p < .05$) (Clifford et al., 1991). Trait anxiety did not change across time. A six point Likert scale was used to rate self-directed change. Results revealed mean ratings of 3.5 for exercise progress, 3.4 for food patterns, 4.0 for weight reduction and 3.2 for stress management. As for the credibility ratings, clients showed no significant differences between treatment groups in regard to their understanding of the treatment. Self-motivation did correlate with reduced body fat ($r = .33 - .45$), reduced health risk ($r = .31 - .67$), and diastolic blood pressure ($r = .37 - .56$). Social support did not prove to be a predictor of behavior, nor did coping style (Clifford et al., 1991). Health risk appraisal was a moderate predictor and body composition showed no negative relationships with exercise adherence or max VO2 scores (Clifford et al., 1991). Self-motivation was found to be the strongest predictor of behavioral health change. These results did not support the hypothesis that peer and professional support would affect group treatment. Again therapy in a group setting proposed few

advantages to interventions designed for the individual weight control client (Clifford et al., 1991).

4. Cognitive-Behavioral Programs

Kirschenbaum's (1990) paradigm calls for interventions drawn from the disciplines of psychology, exercise physiology, and nutrition. Besides emphasizing exercise and nutrition, this paradigm demands more completeness in the quality of assessment and in the component of cognitive-behavioral therapy, areas Kirschenbaum (1990) feels are lacking in research. A further, more detailed look at studies that attempts to deal with the issues of exercise effects on psychological factors (and vice versa) as well as the ramifications these issues have in the spectrum of weight control is needed. One might expect to uncover potential links connecting individual differences to appropriate intervention techniques.

Dishman (in press) suggested that interventions based on cognitive-behavior modifications are the most successful. These interventions utilized basic reinforcement and stimulus control principles focused

at altering psychological variables that are believed to moderate behavior. The goal of intervention involved the client acquiring skills: (a) that were useful in controlling high risk conditions, and (b) that aid in refocusing behavior toward target goals (Dishman, in press).

5. Summary

In summarizing this literature it may be concluded that weight and exercise behaviors are multidimensional constructs that respond best to multidimensional paradigms of intervention therapy. The amount of exercise participated in is not always a direct reflection of activity enjoyment. Information from several studies on exercise behavior and body image satisfaction found that some frequent exercisers exhibit greater amounts of body shape disturbance than moderate exercisers. An improvement in such areas as VO₂ and body composition reflected a healthy life style, yet there are those who experienced these improvements and still retained a negative self-image. These and similar behaviors may be considered addictive by some experts. Perhaps the initial weight loss was

gratifying, but as fitness levels increase one must suddenly work harder to achieve results similar to those in the beginning of the program. This was unmotivating to some, which helped explain current attrition rates, or it may have instigated obsessive behaviors to achieve the perfect body even though it was genetically impossible.

Clearly there was also a need to expand data beyond groups that have a clinical eating disorder to include "normal" populations that are not necessarily obese. Self-efficacy played an important role in goal setting and producing changes in exercise behaviors. The client felt empowered with a gain in perceived control. This fact was present in other changes relevant to advancements toward target behavior, such as a reduction in negative thoughts or increased intrinsic motivational levels. Self-efficacy measures became valuable predictors and screening items which help the therapist structure individual interventions.

The issue is still debatable regarding what type of intervention therapy is best used for optimal results. Cognitive-behavioral based constructs appeared to offer

the best solution to this question. However, the literature is lacking in research conducted on individual methods of intervention. It is not uncommon to individualize someone's strength routine or determine a person's target training range for cardiovascular training. Why has it been slow to occur to this field that group interventions do not always work for all members of the group? For years researchers have known that people differ in many physiological and psychological ways. People are individuals with different needs. Some simply need motivation and direction. Others have more serious problems. This type of construct suggests careful screening of potential clients not to weed out unlikely candidates but to shed light on the areas which need intensive therapy in that individual.

Chapter 3

Methods

The purpose of this investigation was to determine the effects of behavioral and cognitive-behavioral interventions on lifestyle changes. The specific intent of this investigation was to examine the individual psychological and physiological changes of each participant. Accordingly, the methodological approach taken was a qualitative one. An interview, pre- and postprogram test results, and a postprogram evaluation survey were used to generate the data of the study. This chapter includes information on: (a) the subjects, (b) the rationale for the selection and development of assessment techniques, (c) the procedures used for each phase of the study, and (d) analysis of data information.

1. Subjects

Subjects for the present study were volunteers generated from an announcement made at a corporate fitness center regarding the beginning of a weight control program. Because this investigation design

involved multiple case studies, the program capacity was limited. The first 9 participants who registered were taken and informed that the program was a study being conducted on weight control. The subjects ranged in age from 27-56 years, with a mean age of 42 years. All participants were employed at a large federally operated facility in the southeastern United States. An orientation meeting was held where all subjects were told about the components of Phase 1, an intervention and education phase (8 weeks), and Phase 2, a maintenance phase (8 weeks). After the orientation, each participant was given an informed consent (Appendix A) to be read and signed. At this point, the subjects were able to begin preprogram testing and intervention education.

One subject failed to complete the postprogram survey and fitness test. This subject could not be contacted to discover any reasons for these actions. Therefore, only eight of the nine original case studies were analyzed.

2. Rationale for the Selection of Methods

The research design chosen involves multiple case studies to allow the researcher to collect more

detailed knowledge of the effectiveness of certain interventions for weight control. This is one area lacking information in the current literature. Most of the existing research has focused on group assignment to treatment regardless of individual differences and predispositions. Few of the effects produced from such studies were successful and fewer were maintained.

The present study attempted to assess the individual's initial needs and future goals to help the client establish a sound path toward their chosen target behavior. The main emphasis for behavior change integrated self-management techniques, gradually changing life-style behaviors, and education in relapse prevention procedures. This multidimensional approach attempted to facilitate motivation and adherence to the program.

The Body Image Distortion Questionnaire, (Mable, Balance, & Galgan, 1986), BIDQ was chosen to assess the subjects' perceptions of their body size before and after the program. Test-retest reliabilities reported across a 3-week interval were .83 (n=40 males), .89 (n=41 females), and .92 (combined). Concurrent validity

was reported at $r=.89$ for the comparison of responses to the BIDQ and actual body size for 81 subjects (Mable et al., 1986).

Self-esteem was measured using Fox & Corbin's Physical Self-Perception Profile (1989), PSPP. The PSPP examined perceptions of the physical self, a domain of the "global self", from a multidimensional point of view. The PSPP was administered twice, before and after completion of Phases 1 and 2. This scale contains five 6-item subscales: (a) perceived sport competence, Sport; (b) perceived bodily attractiveness, Body; (c) perceived physical strength and muscular development, Strength; (d) perceived level of exercise and physical conditioning, Condition; and (e) physical self-worth, PSW. Reliability for the PSPP reports coefficients ranging from .81 to .88 across three weeks. A factor analysis, endorsing a four factor structure, was able to explain 66.2% of the variance (Fox & Corbin, 1990).

The Perceived Importance Profile (PIP) was designed to be administered along with the PSPP (Fox & Corbin, 1990). The PIP measured the subject's perceived

importance that the individual attached to each of four subdomains: (a) sport, (b) condition, (c) body, and (d) strength. Fox (1990) conceptualized that these scores could be thought of as filters between the subdomain levels and the domain level of overall physical self-worth. Fox suggested that similar filters may also exist between the physical domain, as well as social or academic domains and global self-esteem. If an individual does not perceive the physical self as important, then global self-esteem is not adversely affected by low PSPP scores. Because physical self-worth is considered to operate at the domain level, a corresponding PIP subscale does not exist for that PSPP subscale.

Those individuals who rated certain subdomains high in value, have attached importance to adequacy measured by the PSPP. In doing so, these subdomains possessed a larger amount of influence on general self-worth constructs than would subdomains of lower rated values (Fox, 1990).

When interpreting PIP scores, Fox (1990) recommended a subscale score of 5 or higher (out of 8

possible) as the cutoff criteria for an "important" rating. Once these subscales are identified, discrepancy scores may be calculated (Fox & Corbin, 1990). Discrepancy scores represent differences between PSPP adequacy scores and importance scores on subscales rated as important.

Level of motivation should be considered when dealing with behavior changes. The Commitment to Physical Activity Scale (Corbin, Neilson, Bordsdorf & Laurie, 1987) measured an individual's commitment to participation in the broad domain of physical activity. Split-half reliabilities were reported from .88 ($n = 238$ males) to .91 ($n = 212$ females). The CPA was reported to discriminate between subjects ($N = 450$) who differed in self-reported levels of physical activity involvement (Corbin et al., 1987).

The preprogram results from one assessment, that of exercise adherence factors (predisposing, enabling, reinforcing), aided the researcher in guiding each subject toward more desirable behaviors once the contingency contract had been signed and the self-monitoring process was initiated (Corbin & Lindsey, 1994).

The final questionnaire in the preprogram battery was one of a demographic nature (Appendix B). This provided information such as history with weight control, social support, salient reinforcers, and general levels of job stress. Knowledge of these factors became helpful in individualizing the program for each client.

Upon completion of the preprogram battery of tests (BIDQ, PSPP, CPA, adherence, and demographics), each subject was required to undergo the facility's normal procedures for a fitness test. This test measured five components of fitness and enabled the researcher to individualize the person's exercise prescription. These results were considered base line data to which the final fitness test results at the end of the 14 week program was compared. A sit-and-reach test was used to assess flexibility (Nieman, 1986). Body fat was estimated using either a 3-site skinfold measure (Jackson & Pollock, 1985) or circumference measures (Katch & McArdle, 1988). A waist-to-hip ratio was calculated to explain fat distribution. Muscular endurance was measured by one-minute push-up and

curl-up tests (Howley & Franks, 1990). The final test was a submaximal bike ergometer test used to estimate maximal oxygen uptake, VO_2 (Golding, Myers, & Sinning, 1989). The VO_2 results were then converted to METS and a recommended training range between 60-85% max mets was calculated. At this point, the researcher determined at what level of intensity this subject should be exercising to produce optimal conditions for improvement of VO_2 and facilitation of fat burning. All participants were fitness tested by week 1 of this program.

The fitness components of percent body fat and VO_2 were chosen to be compared at preprogram and postprogram. These measures reflected any changes resulting from increased activity levels. Both cardiovascular and muscular conditioning exercises were prescribed for each subject. The researcher realized that the program was not long enough in duration to produce the subject's desired physiological outcomes yet progress could be made in changing behaviors and attitudes toward exercise and overall health.

3. Procedures

The preprogram events included: (a) the initial program orientation meeting, (b) administration of the written tests and interview, and (c) the initial fitness assessment. These events occurred during a 2 week period prior to the first educational lecture.

The researcher considered Phase 1 to be educational in nature. The first educational lecture focused on basic exercise physiology, and began the first week in Phase 1. The subjects received another educational lecture during the second week which focused on basic nutrition. The third week began the individual sessions with the researcher. This session focused on proper goal setting techniques and contingency contracting. Weeks 4, 5 and 6 of Phase 1 concentrated on teaching subjects the cognitive restructuring techniques of self-talk, relaxation, and visualization/imagery. The final 2 weeks (7 & 8) of Phase 1 focused on relapse prevention techniques.

In Phase 2, the individual weekly sessions became bi-weekly meetings with each subject. These sessions were considered to be similar to "therapy" situations.

Session 1 (weeks 9 & 10) focused on formulating a plan to counteract potential relapses. Session 2 (weeks 11 & 12) concentrated on goal reevaluation and modification. Session 3 (weeks 13 & 14) focused on: (a) recognizing behavioral changes, (b) modifying perceived problem areas in the program, and (c) preparing the subject for program closure.

A postprogram period of 2 weeks included: (a) test readministration, (b) survey completion, and (c) a final fitness assessment. A tabular representation has been included for clarification of these events (Table 3.1.1).

4. Phase 1

Two educational classes were conducted for subjects in a group setting. The first class, on exercise techniques for weight control (Appendix C) was held the same week of the fitness testing. Participants were given exercise logs (Appendix D) and instructions on how to use them on a daily basis. Each subject was expected, but not required, to turn in completed logs at their weekly review session. These daily logs were continued during phase 1, then used weekly (less

Table 3.1.1

The Duration and Relationship of Weekly Events

Phase/Week	Event/Intervention
Preprogram	
Week 1	Initial Meeting
Week 1	Test Administration
Week 2	Initial Fitness Test
Phase 1	
Week 1	Basic Exercise Physiology
Week 2	Basic Nutrition
Week 3	Goal Setting/Contracting
Week 4	Self-Talk
Week 5	Relaxation
Week 6	Imagery/Visualization
Week 7	Relapse Prevention
Week 8	Relapse Prevention con't.
Phase 2	
Weeks 9-10	Maintenance Session 1 *
Weeks 11-12	Maintenance Session 2 *
Weeks 13-14	Maintenance Session 3 *
	* Individualized Sessions
Postprogram	
Week 1	Test Readministration/Survey
Week 2	Final Fitness Test

detailed) during the second phase. The second class was conducted during week 2. This class involved nutrition, focusing on fat reduction and modeling food intake after the American Dietetic Association's (ADA) food pyramid (Appendix E). The subjects were given a dietary habits questionnaire to enable them to assess their present eating behaviors (Appendix F). They were instructed on how to keep a daily record of all foods eaten for that day (Appendix G). This practice was conducted for at least two weeks. At the end of the second week, the dietary logs were reduced to simply: (a) recording foods eaten, and (b) focusing on the ADA food pyramid. This was compared against exercise logs recording activity, duration, and calories burned to evaluate caloric intake versus caloric expenditure.

Week three of phase 1 began the weekly 45 minute long participant-to-consultant format where more detailed individualization took place. This session focused on proper techniques of choosing and setting effective, attainable daily and weekly goals (Appendix H). The client analyzed patterns that emerged from the two-week long exercise and nutrition logs. The fitness

test results also contributed to the goal-setting steps toward achieving the target behavior (desired overall outcome) in changing present life-style behaviors. The client and consultant agreed upon specific goals and integrated them into a contingency contract (Appendix I). This contract was aimed at increasing motivation and adherence to the program.

The following session, week 4, the subject was then educated in the techniques of self-management, self-monitoring, self-evaluation and self-reinforcement. Step 1, self-monitoring, had already been initiated in weeks 1 and 2, and the subjects were encouraged to continue this practice. The subjects learned how to use these records to recognize emerging patterns that could need intervention. They also discovered how to use the records as a source of reinforcement when their intrinsic motivation levels decreased.

In step 2, which was self-evaluation, the subject was directed on how to compare their actual behavior (logs) with perceived behavior (test results, self-talk). These often do not agree in the early

stages of a weight control program. This step was more cognitive-behavioral in nature and was emphasized more for some clients (those with more skewed beliefs) than those with more rational thoughts and expectations.

Finally, in step 3, self-reinforcement, the subject could either: (a) experience immediate satisfaction upon obtaining the results of the evaluation in step 2, or (b) realize the existing inconsistencies between their desired behavior and actual conditions. The latter conclusion sent the subject back to step 2 for further evaluation, or perhaps even back to step 1. If this occurred, the client was encouraged to keep more detailed records or readjust to make attainable goals. In time, these clients also experienced similar satisfaction as compared to clients who initially succeeded in self-management learning procedure.

Subjects who had difficulty in successfully advancing to step 3, i.e., self-reinforcement, or who scored low, relative to sample means, on the BIDQ and/or PSPP, were encouraged to further investigate possible interventions on the cognitive-behavioral level, such as cognitive restructuring through

thought-stopping (Appendix J). This was a primary technique used in this study which emphasized the importance of identifying and modifying self-defeating thoughts. The purpose was to restructure or replace negative thoughts with affirming, positive self-statements (Appendix K). This intervention occurred in week 4. Relaxation techniques (Appendix L) and visualization and imagery techniques (Appendix M) were introduced in weeks 5 and 6, respectively.

The final two weeks in phase 1 centered on subject training in the techniques of relapse prevention (Brownell, Marlatt, Lichenstein, & Wilson, 1986) (Appendix N). The goal of this intervention was to reduce the occurrence of the abstinence violation effect (Chapter 1, p 8). Three types of predictors were considered in relapse prevention: (a) individual and intrapersonal, (b) social and environmental, and (c) physiological. Level of motivation and readiness for change are two individual predictors which effect the abstinence violation effect (Brownell et al., 1986). Self-management and contingency management are useful tools in diminishing these effects as well as

the effects from social and environmental factors, such as loss of support or entering a high-risk atmosphere (e.g. vacation). The physiological effects stem from factors such as genetics and previous attempts at weight loss which can alter the body's basal metabolic rate.

There were three stages in the actual prevention process. Motivation and commitment were the main focal points in stage 1. Contingency management became crucial in this stage. Stage 2 developed the steps for initial behavior change, emphasizing decision making, cognitive restructuring, and coping skills. Maintenance, stage 3, taught the subject how to continue monitoring progress, self-administer interventions if needed, and enlist social support. A gradual change of life-style was highly stressed at this time (Brownell et al., 1986).

5. Phase 2

After phase 1 had successfully been completed, the subjects entered a two month maintenance phase. Physiological changes began to occur during this phase. Subjects continued their weekly log keeping, recording

exercise and nutritional information. These logs were reviewed every week for the remainder of the program. During this phase, it became necessary to adjust goals for some subjects as their fitness levels improved or reached a plateau. Some also needed their dietary goals reevaluated. The client could choose to participate in one-on-one sessions at least once a month, but was urged to meet every two or three weeks. Progress toward goals was publicly charted to maintain motivation and level of commitment.

It was possible for the participant to attend three of these sessions. The topic of session 1 focused on relapse prevention, defining high-risk situations and developing strategies for coping with such situations. These strategic plans were composed of interventions preferred by each individual. The plan could aid the participant in regaining control, thus reducing the chances of lowered levels of self-efficacy through failure to meet their goals.

Session 2 focused on reevaluating the contract and modifying daily or weekly goals. Any changes were agreed upon by both parties. Subjects were asked if

any current goal behaviors would continue on a regular basis without rewards or contingencies. If they felt like these behaviors would continue, the goals were modified or replaced with new goals.

Session 3 focused on: (a) reevaluating motivation levels, (b) recognizing changes in behaviors, and (c) discussing any program related problems that had surfaced.

6. Postprogram

When the client had completed phase two, they were readministered the same test battery. Next, a post program survey was given to each subject to assess the effectiveness and affect generated by the program (Appendix O). These tests were administered prior to the second fitness test to avoid the physiological results influencing the survey responses. The survey asked subjects to report the frequency in which they used each intervention on a weekly basis. It also asked them to order the techniques by degree of importance each one had to that individual's program. Open ended questions attempted to discover any disappointment with the program, how each person would

recover from a relapse, and in what area of their lifestyle had they made progress in. Also in this final week, each participant was reevaluated on the fitness test battery to determine any physiological changes in the five fitness components, with special concentration on VO₂ and body composition.

7. Analysis of Data Information

A single subject multiple baseline method synthesis and analysis of physiological and psychological changes was reviewed for each subject across the four month period. Physiological changes were determined by pre-to postprogram fitness tests. For each subject BIDQ and PSPP scores were compared relative to pretest scores. The subject's CPA and exercise adherence scores were used to determine if the level of commitment and motivation stayed the same or increased over time. Because there were no within group comparisons on these tests, statistical analyses were not applied. In this case, tables indicating each participants quantitative results were the best method for determining intervention effectiveness. Personal program compliance and attendance records indicated the

impact contingency management had on program adherence. For those subjects who continued the self-monitoring process, early program exercise and nutritional weekly averages were compared against late program weekly averages to determine if any positive changes occurred in these two behaviors.

An evaluation survey was compiled for the subjects upon completion of phase 2. A thorough inquiry may suggest reasons behind: (a) individual affect produced by material; and (b) knowledge gained from this program, i.e., if these interventions altered previous exercise and dietary patterns. Responses for technique importance and frequency were analyzed for the general group to see if patterns of intervention preferences existed.

Chapter 4

Results and Discussion

1. Introduction

The following case studies represented the behavioral, cognitive-behavioral, and physiological changes that occurred to each subject during the program. The name of each case study was selected by the subject as their "code" name. They were referred to by this name on a poster in the exercise facility that was posted to chart their exercise progress.

Each study consisted of analyzed information for the areas of: (a) preprogram scores, (b) the initial interview, (c) the initial fitness test, (d) initial self-monitoring, (e) maintenance sessions, (f) final self-monitoring, (g) postprogram scores, (h) final fitness test, and (i) the postprogram survey.

CPA test sample means and standard deviations (Table 4.1.1) were used to determine raw and standard scores for each subject. The same method was used to calculate BIDQ (Table 4.1.2) raw and standard scores and PSPP/PIP (Table 4.1.3) raw and standard scores.

Table 4.1.1

CPA Test Development Sample Mean and Standard
Deviations

Group	Mean	SD
Females	45.96	7.04
Males	46.68	6.07
All Subjects	46.34	6.55

Note. From "Commitment To Physical Activity"
by Charles B. Corbin, A. Brian Nielsen, Laura
L. Bordsdorf and David R. Laurie, 1987,
International Journal of Sport Psychology, 18,
215-222.

Table 4.1.2

BIDO Means and Standard Deviations

	Mean	SD
Females	.15	.13
Males	-.01	.13

Note. From "Body-Image Distortion and Dissatisfaction in University Students" by Harriet M. Mable, William D. Balance, and Richard J. Galgan, 1986, Perceptual and Motor Skills, 63, 907-911.

Table 4.1.3

PSPP and PIP Sample Means and Standard Deviations

Subscale	Female		Male	
	Mean	SD	Mean	SD
Sport	14.49	4.23	17.24	3.85
SportImp	4.55	1.50	5.51	1.58
Condition	14.93	4.05	16.43	3.76
ConditionImp	5.43	1.43	5.61	1.38
Body	13.79	4.16	16.43	3.76
BodyImp	5.80	1.29	5.49	1.34
Strength	14.83	3.60	15.62	3.08
StrengthImp	5.01	1.28	5.37	1.27
PSW	14.79	3.82	16.66	3.37

Note. From "The Physical Self-Perception Profile: Development and Preliminary Validation, 1989, Journal of Sport and Exercise Psychology, 11, 408-430.

2. Case Studies

Case 1: Phoenix

Preprogram Scores. Phoenix is a 57 year old Caucasian female. The subject's preprogram scores suggested that she had relatively normal levels ($z = .15$) of motivation and commitment (Table 4.2.1.1) in comparison to test development sample means and standard deviations (Table 4.1.1). She rated "good" on all exercise adherence factors (Table 4.2.1.2). Phoenix reported a percent body image distortion (Table 4.2.1.3) of 11.32% ($z = -.31$). Ratings of adequacy on PSPP subscales were varied, with three of the four subscales having been rated as "important" by PIP scores (Table 4.2.1.4), producing some discrepancy between the two scales (Table 4.2.1.5).

These scores suggested that Phoenix possessed commitment and adherence supportive of behavioral changes. The relatively low amount of distortion indicated that Phoenix had a rational body size perception and some degree of self-acceptance.

Table 4.2.1.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	47	60
z score	.148	1.99
% tile	56.0	98.0

Table 4.2.1.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

Factor	Preprogram		Postprogram	
	Score	Rating	Score	Rating
Predisposing	8	Good	13	Very Good
Enabling	4	Good	7	Excellent
Reinforcing	5	Good	6	Excellent
Total	17	Good	26	Very Good

Table 4.2.1.3

Pre- and Postprogram BIDQ Results

	Pre	Post
Actual Weight		
Ratio	1.59	1.52
Perceived Weight		
Ratio	1.77	1.54
% Distortion	11.32	.02
z score	-.28	-1.03
%tile	39.00	16.00

Table 4.2.1.4

Pre- and Postprogram PSPP and PIP Raw and Standard Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	13	-.35	36	18	.83	80
SportImp	2	-1.70	4	4	-.37	36
Condition	13	-.48	32	24	2.24	99
ConditionImp	8	1.80	96	8	1.80	96
Body	9	-1.20	12	23	2.20	99
BodyImp	5	-.62	27	7	.93	82
Strength	18	.88	81	23	2.27	99
StrengthImp	6	.77	78	8	2.23	99
PSW	16	.32	63	24	2.40	99

Table 4.2.1.5
PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	-	-
Condition	-3.7	0
Body	-2.0	.60
Strength	0	-.40
Total	-5.7	.20

Interview. In the preprogram interview, Phoenix indicated she felt exercise was most important to overall health and agreed that she participated in physical activity for enjoyment. She reported having been on one diet program in the past 3 years. Phoenix claimed to participate in aerobic activity, as defined by the ACSM, 3-4 times a week. When asked about nutritional habits, she claimed to "sometimes" eat the daily recommended servings as suggested by the ADA.

Fitness Test 1. The preprogram fitness test (Table 4.2.1.6) revealed a percent body fat of 41% and the predicted maximum $\text{VO}_2 = 20 \text{ ml/kg/min}$. These were rated as "needs work" for women of this age range. Walking was her preferred mode of exercise, but Phoenix indicated she liked a variety of exercises to reduce potential boredom. Phoenix was encouraged to participate in both cardiovascular and muscular endurance activities.

Self-Monitoring 1. The subject was asked to self-report daily exercise and nutritional habits. These were to be turned in on a weekly basis. During the first 3 weeks of the program, Phoenix averaged 50

Table 4.2.1.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	130/80	120/72
Flexibility (in.)	12.25	13.25
% Body Fat	41.0	36.0
Max VO2 (ml/kg/min)	20.0	27.7
Muscular Endurance		
Push-ups	5	13
Curl-ups	-	-
Sit-ups	0	0
Weight (lbs.)	179	175

minutes of cardiovascular activity and 41 minutes of muscular endurance activity. Nutritional weekly averages for the same 3 week period were reported (Table 4.2.1.7), and it was clear that the subject had nutritional deficiencies in all food groups except the meat/fish/eggs group.

Goals. Taking the subject's reported monitorings and fitness test results into account, goals were set for Phoenix. Daily goals included: (a) walking 10-15 minutes, followed by 5 minutes of stretching, (b) eating one piece of fruit in the morning and bringing one piece of fruit to work as a snack, and (c) limiting coffee intake to 2 cups. Weekly goals were as follows: (a) walking a minimum of 6 miles in her target heart rate (THR) zone, (b) exercising with a muscular toning video at least once, and (c) limiting bacon intake to 3 pieces. These goals focused on increasing daily activity and nutritional awareness.

Maintenance Session 1. Phoenix defined an individually oriented high-risk situation by working late at night. She claimed that she often worked late and waited to eat "dinner" until she left for home.

Table 4.2.1.7

Early vs. Late Program Nutritional Weekly Averages

Group	ADA Recommended	Early	Late
Dairy	14	2.7	3.5
Meat/Fish/Eggs	14	14.7	17.5
Fruit/Vegetables	35	21.0	22.5
Bread/Cereal	42+	28.0	39.5

When asked what she could do to help diminish these situations from occurring, she stated, "I've been trying to work on getting things prepared to have at home...that's still something I've got to get conditioned for, it hasn't become part of my basic behavior yet.". When asked if she had noticed any differences resulting from diet changes, Phoenix replied:

I'm already finding that when I eat foods with grease in them it's beginning to bother my stomach. It's funny, the more you change your habits one way, all of a sudden you get to where you don't like some of these other foods any more.

Although working late tended to make this subject anxious, she sensed she was gaining more control over these situations through self-talk and relaxation.

Phoenix was a member of the local Wine Society board and expressed concern over their many dinners and wine tasting events. When asked if these events had become easier to deal with she stated:

Yes, I used to look at it (menu) and think "Oh this sounds good.", and then go gobble, gobble, gobble.

I have learned that I can go ahead and maybe take 1 or 2 bites of something and get my fill. I don't feel compelled that I have to finish. I think more about what has gone into it.

The subject was questioned if using self-talk for these high-risk situations helped, Phoenix answered:

Yeah, they have. I think that has helped some of the self-confidence too, because I think coupled with exercise, I'm finding that I'm standing straighter and I have a greater feeling of self-confidence. I think that is from the exercise, the self-talk and being more aware of everything.

Phoenix confirmed that she had not used imagery a "whole lot yet" when coping with these high-risk situations. The subject obviously felt that knowledge and self-talk had been key components in her program.

Maintenance Session 2. Many unforeseen events occurred in the subject's life during this time period which could have affected her progress. During a three week period, Phoenix had one friend pass away, another friend experienced a heart attack, and Phoenix,

herself, contracted the flu. The subject reported being anxious about an upcoming doctor's visit to check her cholesterol. Phoenix also indicated that she had begun to investigate other job opportunities during this time period.

Aside from these obstacles, the subject appeared to be taking great efforts to change her behaviors. She mentioned that she had told some peers about her involvement in the program, and said she found the verbal commitment encouraging.

Phoenix chose to modify her contract, increasing her daily stretching to 15 minutes. She also chose to focus on obtaining 5 servings of fruit and vegetables every day. Weekly goals were also modified, focusing on increasing the duration and/or frequency of exercise. When questioned whether her rewards had been helpful, Phoenix responded, "They weren't really helpful. The program itself, to me, is more motivational. I don't feel like I need to have a pay off.". Finally, the subject was asked to comment on any perceived changes in motivation or stress reduction, Phoenix replied, "I do realize that this is

more long term. I think I am getting more motivated for the right reasons. I think it helps me in negative situations. Now I focus on the positive things."

The subject indicated in this session that rewards were not very helpful in modifying her behavior. This suggested that she had become more intrinsically oriented to achieve better health. Considering all of the distress from negative circumstances, the subject appeared to be positive, drawing support from her achievements in this program.

Maintenance Session 3. This session focused on further modification of the subject's dietary needs. Although she was keeping detailed logs, she still was experiencing trouble meeting the recommended daily requirements. It seemed that the logs produced greater awareness of her habits, yet efforts were not made to fulfill any deficiencies during the day. Eating out frequently and working late still concerned both the researcher and the subject. It was suggested that Phoenix focus more effort on fulfilling the food pyramid and less on the details of every meal. She did admit, "I looked at the last one and thought, I'm not

getting a balanced diet.". Packing and bringing lunches and snacks to work was also discussed. Phoenix expressed a desire to count her caloric intake more carefully. The researcher agreed that this might be useful considering the number of extravagant meals eaten out at restaurants. Monitoring caloric expenditure was also suggested to the subject in order to increase her awareness of the effort required to "burn off" high fat or high calorie foods. Obviously this subject was moderately struggling with her program, indicating her goals were challenging, yet attainable.

Self-Monitoring 2. The subject's final three exercise and diet logs were analyzed in an attempt to reflect any changes in these two behaviors. Phoenix reported a weekly average of 2 hours of cardiovascular exercise and 1 hour 15 minutes of muscular endurance exercise. Nutritionally, she reported a weekly average of 3.5 dairy servings, 17.5 meat servings, 22.5 fruit/vegetable servings, and 39.5 bread/grain servings (Table 4.2.1.7). There is a clear lack of dairy servings and an abundance of meat servings. These

results suggested that Phoenix still needed more time to develop better nutritional habits, but had made some improvements in a relatively short amount of time, 16 weeks.

Post Program Scores. The subject's postprogram CPA score indicated a significant change in levels of motivation (Table 4.2.1.1). A preprogram score ($z = .15$) indicated an average amount of motivation early in the program. A postprogram score of 60, which corresponds to the 98th percentile, reflected a major improvement in Phoenix's motivation and commitment to exercise.

All exercise adherence factors improved from "good" to "excellent" ratings (Table 4.2.1.2), perhaps due to successful goal attainment or increased knowledge about nutrition, exercise, and behavior control. Her preprogram body image distortion of 11.32% corresponded to the 39th percentile. Phoenix's postprogram score of .02% represented an 11.30% reduction in distorted body perceptions. This score corresponded to the 16th percentile score (Table 4.2.1.3).

The PSPP scores reported improvement for Phoenix in

all subscale perceptions of adequacy (Table 4.2.1.4). The sports subscale score increased from 13 to 18 in the postprogram test. This raw score of 18 was equal to a percentile score of 80. The condition subscale score improved to 24, which corresponded to the 99th percentile. The body image subscale raw score increased from 9 to 23. This postprogram score ($z = 2.2$) was comparable to a percentile score of 99. The strength subscale score improved to 23, which was equal to the 99 percentile. The final subscale, measuring physical self-worth, increased from 16 to 24. This raw score of 24 ($z = 2.4$) was comparable to a percentile score of 99.

PIP scores also improved or remained unchanged (Table 4.2.1.4). The subject reported a preprogram PSPP(adequacy) and PIP(importance) total discrepancy score of -5.7. As a result of a reported increase in perceived adequacy in all subdomains, the previous total discrepancy score improved to a score of 0.2 (Table 4.2.1.5). The higher or unchanged PIP scores for Phoenix reflected an increase in her perceived value of each subdomain. These more "valuable"

subdomains positively affect general physical self-worth.

All postprogram scores reflected positive changes in commitment, exercise adherence, and self-esteem. A reduction in body image distortion indicated that Phoenix improved in the ability to realistically evaluate her body.

Fitness Test 2. The psychological changes were possibly due to the physiological changes evident in this second fitness test. Phoenix's percent body fat decreased from 41% to 36%. Maximum VO₂ also increased from 20 ml/kg/min to 27.7 ml/kg/min. Other components of fitness also showed improvement (Table 4.2.1.6).

Post Program Survey. Phoenix reported in the survey that she valued the personal attention she received as well as the program's attempt to individualize a plan to meet her needs. She disagreed that she would have functioned better in a group setting. She also disagreed that there was too much information presented to her and that the program was too complicated. Phoenix ranked program individualization as the most important component of her self-management plan, with personal sessions ranked

second.

Interventions most frequently used by Phoenix were: (a) monitoring exercise and diet, used 6+ times/week; and (b) relaxation and self-talk, which she used approximately 4-5 times a week. Goal setting was ranked as the most important intervention, followed by contracting, monitoring and self-talk, respectively. Clearly, this subject thought she gained benefits from both behavioral and cognitive-behavioral techniques. Phoenix reported that the tools she learned "have been most effective, and I really feel I am making progress toward better overall health.". Phoenix believed she now has the means to forgive herself in the event of a relapse, rather than "admitting defeat". She added, "I really relearned that I am the one who controls what I can do and be!" In response to the question, "In what areas have you made the most progress?", Phoenix answered, "self-esteem, general overall confidence, better health, ability to relax, establish balance in my life and perform my job better and with a greater degree of confidence in my ability to achieve goals I set."

In conclusion, it is clear from these test scores and quotations, that Phoenix made great advances in attitudes toward lifestyle changes. She improved her physical self-esteem, possibly the result of goal achievement, which has transferred to other areas of her life. Perhaps the increased sense of control over one aspect of her life (health) has produced definite changes in self-confidence, motivation and adherence to exercise. Phoenix has gained the ability to perceive her body in a rational way, even though she still has more body fat to lose for optimal health.

Case 2: Flash

Preprogram Scores. Flash, a 27 year old Caucasian female, was the youngest subject in this study. The preprogram score of 36 ($z = -1.4$) suggested she possessed a low level of motivation (Table 4.2.2.1) in relation to the sample Corbin et al., (1987), used in development of the CPA (Table 4.1.1). All exercise adherence factors were rated as "good" (Table 4.2.2.2) and the subject reported 44% body image distortion ($z = 2.23$) on the BIDQ (Table 4.2.2.3).

Table 4.2.2.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	36	46
z score	-1.41	.01
% tile	8.00	50.00

Table 4.2.2.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

Factor	Preprogram		Postprogram	
	Score	Rating	Score	Rating
Predisposing	7	Good	10	Very Good
Enabling	4	Good	6	Very Good
Reinforcing	4	Good	7	Excellent
Total	15	Good	23	Very Good

Table 4.2.2.3

Pre- and Postprogram BIDQ Results

	Pre	Post
Actual Weight		
Ratio	1.28	1.29
Perceived Weight		
Ratio	1.85	1.66
% Distortion	44.00	29.00
z score	2.23	1.10
%tile	99.00	87.00

This subject's PSPP and PIP scores reflected below average adequacy scores on all subscales (Table 4.2.2.4) when compared to sample means and standard deviations (Table 4.1.3). However, the condition, body image, and strength subscales were reported as important on the PIP, thus producing large preprogram discrepancy scores (Table 4.2.2.5). Concluding from these scores, Flash perceived 3 of the 4 subscales to be important to her general physical self-worth. The low adequacy scores on these same subscales produced discrepancies that could affect physical self-worth, and global self-esteem.

Interview. A preprogram interview conducted after the initial testing, revealed that this subject had been on two weight reduction programs within the past three years. She claimed to never eat the daily recommended servings suggested by the American Dietetic Association's food pyramid. She also stated that she presently participated in aerobic activity, as defined by the ACSM, 0 to 1 times per week. Flash disagreed that enjoyment was the main reason for exercise, but felt that exercise was most important to overall

Table 4.2.2.4

Pre- and Postprogram PSPP and PIP Raw and Standard Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	14	-.12	45	16	.37	64
SportImp	3	-1.00	16	4	-.37	35
Condition	8	-1.70	5	18	.76	78
ConditionImp	7	1.10	87	6	.40	66
Body	9	-1.20	12	12	-.43	33
BodyImp	7	.93	82	6	.16	56
Strength	14	-.23	41	16	.33	63
StrengthImp	7	1.55	94	6	.77	78
PSW	12	-.73	23	17	.56	71

Table 4.2.2.5

PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	-	-
Condition	-4.3	0
Body	-4.0	-2.00
Strength	-2.3	-.70
Total	-10.6	-2.70

health.

Fitness Test 1. Fitness test results (Table 4.2.2.6) revealed 30% body fat and submax $\dot{V}O_2 = 27$ ml/kg/min. This subject's preferred modes of exercise were walking and using aerobic or toning videos. Flash also had access to a ski machine at home.

Self-Monitoring 1. In an attempt to assess current eating patterns and activity levels, the subject was asked to keep weekly logs of each behavior. Based on the information reported during the first three weeks of the program, Flash averaged 17 minutes of cardiovascular exercise per week. During the same time frame, her weekly nutritional averages of suggested servings were much lower than the ADA recommends (Table 4.2.2.7). Clearly, this subject was not receiving adequate nutrition.

Goals. The daily goals for Flash included: (a) eating something for breakfast every day, (b) bringing one piece of fruit to work every day, and (c) skiing at home for 5 minutes every day. The latter goal was increased to 10 minutes/day during Phase II. The weekly goals included: (a) walking for 20 minutes in her target heart rate range twice each week, (b)

Table 4.2.2.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	115/75	120/80
Flexibility (in.)	17.25	18.75
% Body Fat	29.0	31.0
Max VO2 (ml/kg/min)	27.0	30.0
Muscular Endurance		
Push-ups	0	3
Curl-ups	12	13
Sit-ups	-	-
Weight (lbs.)	198	206

Table 4.2.2.7

Early vs. Late Program Nutritional Weekly Averages

Group	ADA Recommended	Early	Late
Dairy	14	4.0	8.0
Meat/Fish/Eggs	14	9.3	12.6
Fruit/Vegetables	35	7.6	18.6
Bread/Cereal	42+	11.6	22.0

engaging in 20 minutes of muscular endurance training once a week, and (c) limiting eating out to twice a week.

Maintenance Session 1. Flash defined a high-risk situation as being more individually oriented than socially oriented. When asked what affected her in this manner, she replied, "I guess the main thing is my own mood or, I guess just the blahs, I tend to eat more.". Flash reported no specific cause related to these days, she just wakes up feeling "blah". According to the subject, such a day occurs about once a month, adding, "I guess your own self-image, you just feel bad about everything. Nothing goes right, you look awful, you know.". When asked what went through her mind on such days, she stated, "I find myself in front of the mirror saying, "God you're fat" and then the turn around is like, "But you're doing something about it.". The latter part of this statement indicated Flash had been using self-talk to counteract her negative thoughts. The topic of exercise education surfaced upon asking her to expound on previous relapses. Flash stated, "I've been on diets that haven't worked before. There was no emphasis on

exercise. I've learned a lot since then, and I know that's not the way to do it.". Obviously this subject perceived the knowledge of exercise acquired from this program as a powerful tool for increasing self-esteem and self-efficacy. Flash admitted to using relaxation and imagery for stress reduction, but not for directly enhancing self-efficacy.

Maintenance Session 2. This session focused on the possible need to modify her current goals. Flash wished to adjust: (a) her daily goal of skiing for 5 minutes to 10 minutes; and (b) her weekly goal of two, 20 minute aerobic bouts, to three 20 minute bouts per week. This action is noteworthy, considering her initial struggle with 5 minutes of daily exercise previously mentioned in the first self-monitoring section.

When asked if she had begun to notice any physiological changes, she stated, "My energy and that kind of stuff has changed, composition wise it hasn't changed much, but I know something is going on.". She had not experienced any "blah" days since session 1. Flash requested we discuss a magazine article that was

available at the exercise center to all facility participants pertaining to the effects of writing down your goals or contracting. She commented, "I think writing it down triggers a goal." Clearly, self-monitoring was important and useful for this subject. It allowed her to take an objective look at her previous behaviors, monitor changes in them, and reach her desired outcomes.

Maintenance Session 3. When Flash was questioned on her level of motivation toward exercise, she replied, "It's better. I don't dread it half as much as I did.". She stated that she had been sleeping well and her strength was improving. Flash admitted:

Doing it the right way does take a whole lot longer, but if you really think about it, you didn't put it on over night. Slowly but surely, it does me good. I don't want to push it and lose motivation.

This subject prefers slow, gradual changes and has become very realistic in how to achieve them.

Self-Monitoring 2. The first self-monitoring section attempted to discover early program diet and exercise patterns. In this section, the subject's

final three logs were analyzed in attempt to uncover any changes in these two behaviors associated with weight control. Flash reported a weekly average of 3 hours of cardiovascular exercise and 33 minutes of muscular endurance exercise. Positive changes also took place in her nutrition level (Table 4.2.2.7).

Postprogram Scores. CPA scores showed an increase in motivation (Table 4.2.2.1) to exercise from a low level ($z = -1.4$) to a more normal level ($z = .01$) of commitment (Table 4.1.1). Exercise adherence factors also improved (Table 4.2.2.2). There was a 15% reduction from preprogram percent body image distortion ($z = 2.23$) to postprogram distortion ratings ($z = 1.1$) (Table 4.2.2.3). The scores suggested that changes occurred in beliefs about and attitudes toward exercise. These changes were possibly the result of an increased sense of control over general health through goal achievement. Such changes often operate in cyclical fashion where goal achievement leads to increased motivation, thus producing reinforcement for adherence, which may then lead to increased self-efficacy, and so on.

PSPP scores produced varied increases in subscale adequacy, some more so than others. Slightly lower PIP scores, along with the elevated PSPP scores (Table 4.2.2.4), produced lower discrepancy scores (Table 4.2.2.5). Such changes in discrepancy reflected a more balanced ratio between perceived adequacy and perceived importance. For Flash, this suggested that a higher perceived adequacy in each subscale area, may have altered the perceived importance certain subscales had on general physical self-worth. Translated, this could mean each subdomain had evolved to nearly equal importance in how they affected the physical self-worth domain, and, potentially, Flash's global self-esteem.

Reduction in body image distortion indicated the subject's increased ability to more realistically evaluate the perception of her actual body size in comparison to what she considered "just right" for her. This change may help explain the slight increase on the PSPP body subscale.

Fitness Test 2. The changes mentioned above occurred even though postprogram fitness test results (Table 4.2.2.7) revealed a slight increase in body fat

(from 30% to 31%). Maximum VO₂ increased from 27 ml/kg/min to 30 ml/kg/min.

Postprogram Survey. On a Likert type scale Flash "strongly" agreed that she valued the program's attempt to individualize a plan to meet her needs. She also "strongly agreed" to value the personal attention she received. She disagreed that she would have functioned better in a group setting. Likewise, she disagreed that the program was too complicated or that too much information was presented to her. Flash ranked education in exercise as most important to her self-management plan. Program individualization was second in importance.

The interventions most frequently used by Flash were exercise and diet monitoring (6+ times/week) and self-talk (4-5 times/week). Goal setting was ranked as the most important intervention, followed by contracting, self-talk, and monitoring, respectively.

Flash was very pleased with the overall results, stating that the tools she learned "will be helpful long after the program". She established monitoring, goal setting and positive affirmations as a plan of

action if a relapse occurred. In answering the question, "In what areas have you made the most important progress?", she replied, "maintaining a regular exercise program and also generally feeling better about myself".

In conclusion, it is evident that this subject made advancements from previous behaviors toward more desired lifestyle behaviors. Although some changes are more gradual than others, it was possible for this subject to experience improvement in motivation, adherence, self-esteem and body image with only gradual changes in diet and exercise patterns. Even though the program was too short to see any measurable changes physiologically, shifts in attitudes and beliefs about many aspects of health and fitness did occur.

Case 3: Golfer

Preprogram Scores. Golfer, a 42 year old female, was a part time employee and the mother of two children. The subject's preprogram CPA score (Table 4.2.3.1) suggested she had relatively low levels ($z = -1.56$) of motivation in relation to the test sample

Table 4.2.3.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	35	43
z score	-1.56	-.42
% tile	6.00	33.00

means and standard deviations (Table 4.1.1). All exercise adherence factors were rated as either "good" or "fair" (Table 4.2.3.2). The subject reported 27% body image distortion (Table 4.2.3.3), which corresponds to the 82nd percentile (Table 4.1.2).

Golfer's PSPP scores reflected average or below average (Table 4.2.3.4) levels of perceived adequacy when compared against the sample means (Table 4.1.3). PIP scores indicated the subject ranked 3 of the 4 subscales as "important", thus producing a large, negative preprogram discrepancy score (Table 4.1.3.5). It may be concluded that these three subdomains were valued parts of Golfer's initial concept of general self-worth. The low adequacy scores on comparable PSPP subscales produced discrepancies that could affect global self-esteem.

Interview. The preprogram interview revealed that Golfer had been on 2 diet programs in the past 3 years and did not maintain the results from either one. The subject indicated she felt exercise was most important to overall health, but disagreed that she participated in physical activity for enjoyment. She claimed to

Table 4.2.3.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

Factor	Preprogram		Postprogram	
	Score	Rating	Score	Rating
Predisposing	5	Fair	10	Very Good
Enabling	4	Good	6	Very Good
Reinforcing	5	Good	7	Excellent
Total	14	Fair	23	Very Good

Table 4.2.3.3

Pre- and Postprogram BIDQ Results

	Pre	Post
Actual Weight		
Ratio	1.07	1.12
Perceived Weight		
Ratio	1.36	1.45
% Distortion	27.00	29.00
z score	.92	1.08
%tile	82.00	86.00

Table 4.2.3.4

Pre- and Postprogram PSPP and PIP Raw and Standard Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	12	-.59	27	16	.36	64
SportImp	6	.97	83	6	.97	83
Condition	12	-.72	23	18	.76	78
ConditionImp	6	.40	66	6	.40	66
Body	9	-1.20	13	12	-.43	33
BodyImp	6	.16	56	6	.16	56
Strength	15	.05	53	16	.33	63
StrengthImp	4	-.79	21	4	-.79	21
PSW	10	-1.25	10	13	-.47	32

Table 4.2.3.5

PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	-2.0	-.70
Condition	-2.0	0
Body	-3.0	-2.0
Strength	-	-
Total	-7.0	-2.7

"never" eat the recommended daily servings as suggested by the ADA's food pyramid. Golfer also reported that she participated in aerobic activity, as defined by the ACSM, 0-1 times per week.

Fitness Test 1. The preprogram fitness test results (Table 4.2.3.6) indicated that the subject had approximately 20.3% body fat and a predicted maximum VO2 of 35 ml/kg/min. Golfer's preferred modes of exercise were jogging and walking. She also had access to a Nordic Track ski machine at her home. Golfer expressed interest in participating in some form of regular muscular endurance exercises.

Self-Monitoring 1. Golfer was asked to monitor daily exercise and eating habits through weekly self-reports. This attempted to assess present behaviors. This subject turned in two such logs. In a two week period of time, she reportedly averaged lower number of servings than is recommended by the ADA (Table 4.2.3.7). During the same time frame, Golfer averaged 1 hour 15 minutes of aerobic activity and 50 minutes of calisthenics each week.

Table 4.2.3.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	112/76	100/70
Flexibility (in.)	15.50	15.50
% Body Fat	20.3	23.0
Max VO2 (ml/kg/min)	35.0	32.0
Muscular Endurance		
Push-ups	0	30
Curl-ups	29	33
Sit-ups	-	-
Weight (lbs.)	146	154

Table 4.2.3.7

Early vs. Late Program Nutritional Weekly Averages

Group	ADA Recommended	Early	Late
Dairy	14	9.0	-
Meat/Fish/Eggs	14	13.5	-
Fruit/Vegetables	35	31.5	-
Bread/Cereal	42+	21.5	-

Goals. Taking all preprogram information into account, goals for Golfer were developed. Her daily goals included: (a) taking 2 pieces of fruit to work every day, (b) eating (or drinking) 1 vegetable during the work day, and (c) participating in 10 minutes of exercise, either aerobic or endurance types. Weekly goals were as follows: (a) participating in cardiovascular exercise 2-3 times every week for 20 minutes, (b) spending 20 minutes doing toning exercises at least once a week, and (c) limiting fast food intake to 2 meals per week.

Maintenance Session 1. Golfer defined lack of time as a potential threat to her program, stating, "I just lack the time to do it 3 or 4 times a week. I think keeping a diet log might help me keep up with what I'm eating.". The subject had not previously been keeping these records, except for the first 2 weeks of the program. Monitoring was highly emphasized and encouraged throughout the program, however, it was not mandatory to maintain the logs if the subject felt she was gaining nothing by doing so. Although Golfer had not found keeping records helpful earlier, she began to feel it was a useful tool.

When asked if she found her reward system helpful, she replied:

That was really helpful at first. Those things are nice and they may be helpful a little bit, but most of my motivation is internal. I want to do this. I want to feel better, I want to look better, and that's why I'm doing it. All the other stuff is just real secondary to me.

Golfer was asked what she would do if she thought she was experiencing a lapse or relapse. She responded, "I guess I would set some reasonable goals. I guess I would use self-talk.". This suggested that Golfer was internally motivated to exercise, yet didn't quite know how to get or keep herself at such a maintenance level of adherence. The final statement above suggests Golfer was uncomfortable with the amount of (or lack of) control over her behavior. It seemed as though she was still leery about the effectiveness of the interventions presented to her.

Maintenance Session 2. This session focused on the subject's level of motivation and contract modification. When asked if she felt her level of

motivation had improved, Golfer answered:

I guess so. It is hard with 2 weeks off for vacation. It's harder to do and trying to get caught back up with everything; and it seems like you have to make yourself do it, but I have been. Golfer wished to adjust her daily goal of exercising, stating, "It would be a reward on the days I run to not have to get up that extra 15 minutes early.". This statement, and the one above, suggests this subject was still experiencing difficulty in wanting to exercise and enjoying it. The subject's goals were adjusted from 20 minutes to 30 minutes of cardiovascular activity 2-3 times a week.

This was a good start for building cardiovascular endurance, however, it is not optimal for producing changes in body composition. Golfer did mention several times that she had not noticed any physiological changes. She was reminded to focus her attention on her process oriented goals in order to eventually achieve the desired outcomes.

Self-Monitoring 2. Because this subject felt monitoring her diet was not helpful to her, she

discontinued doing so early in the program. This was optional for all subjects and did not reflect any difficulties in compliance. However, it appeared that Golfer realized that monitoring could be useful to her, helping her gain control over her eating patterns. She chose to reinstate this practice in the final month of the program. The researcher feels these records are not representative of any changes due to the long period of time for which no logs were kept. Therefore, these logs are not represented in Table 4.2.3.7 for this subject.

Golfer did continue to monitor her activity level, which did increase in duration from the beginning of the program. For a period of the final 2 weeks of the program, she averaged 2 hours 15 minutes of cardiovascular activity and 1 hour 15 minutes of toning activity each week.

Postprogram Scores. Postprogram CPA scores indicated slight improvement in Golfer's level of motivation (Table 4.2.3.1). This score was still below average commitment levels ($z = -.42$) producing less favorable conditions for sustained, long term

motivation. All exercise adherence factors improved (Table 4.2.3.2) suggesting Golfer's beliefs about exercise had changed, becoming more positive than before. Although these factors were favorable for continuing behavioral changes, they did not reflect the lower levels of motivation assessed by the CPA scores.

Golfer's percent of body image distortion (Table 4.2.3.3) increased slightly from 27% ($z = .92$) to 29% ($z = 1.08$). Perhaps this resulted from a weight gain of 8 pounds and the fact that she felt her efforts to monitor change were inadequate to produce desired results.

PSPP scores reported increased in all subscale perceptions of adequacy, more so in some than others. All PIP scores remained the same (Table 4.2.3.4). The sport and condition subdomain scores reflected the greatest changes in adequacy. Golfer reported a postprogram sport score of 16, which was comparable to the 64th percentile. This was an improvement over the preprogram score of 12, which was comparable to the 27th percentile. Condition scores also suggested improvement, with a postprogram score of 18, which

corresponded to the 78th percentile. This was much higher than the preprogram score of 12, which corresponded to the 23rd percentile. Although these scores reflected improved body image, the postprogram score of 12 ($z = -.43$) was still below comparable sample averages (Table 4.1.3). Perhaps this was related to the elevation in percent body image distortion on the BIDQ (Table 4.2.3.3) which indicated higher actual and perceived weight ratios.

These elevated PSPP scores produced a lower total discrepancy score (Table 4.2.3.5). Hypothetically, higher negative discrepancy scores are indicative of lower physical and global self-esteem. Therefore, such changes possibly reflected Golfer's perception of self-esteem was shifting toward a more balanced adequacy/importance ratio.

Fitness Test 2. Postprogram fitness test results revealed a decrease in predicted maximum VO₂ from 35 to 32 ml/kg/min. Golfer's body composition measures increased from 20.3 to 23% body fat (Table 4.2.3.6).

Postprogram Survey. Golfer reported that she valued the program's attempt to individualize a plan to

meet her needs, as well as the personal attention she received. The subject reported a "neutral" rating that she would have functioned better in a group setting. She strongly disagreed that the program was too complicated or that too much information was presented to her. Golfer ranked program individualization as most important to her self-management plan, and education in nutrition ranked second.

The interventions most frequently used by Golfer were: (a) exercise and diet monitoring (6+ times/week), and (b) rewards and self-talk (2-3 times/week). Although the subject did not turn in any logs, she claimed to keep a "mental" check every day. Contracting was ranked as the most important intervention, followed by goal setting, monitoring, and rewards, respectively.

Golfer claimed to be pleased with the overall results, stating, "I'm not sure I improved my physical condition, but I maintained my ground and adopted good techniques for avoiding or minimizing future lapses.". She specifically identified goal setting, rewards, and possibly monitoring as a potential plan of action

in the event of a relapse. Her response to one question, "In what areas have you made the most progress?", was simply, "Nutrition, trying to eat more fruits and vegetables.". When asked if she felt the methods presented to her could help her reach and maintain preferred behaviors, she stated, "I feel certain I will have trouble finding time to exercise at certain points in the future, but I'm more determined than before to get back on track as soon as possible.".

In conclusion, this subject gained some positive ground toward changing present patterns. Golfer stated that she was internally motivated, yet seemed to benefit more from behavioral techniques such as monitoring and rewards. These types of interventions were ranked as important to her individualized plan. She possibly could have seen better results in a "stricter" behavioral program, one that required monitoring and demanded more regular exercise. The subject realized the potential held by such interventions too late in the program to see measurable changes. However, because this program was based on self-management and self-monitoring, she would now be able to modify her program to best fit her needs.

Ultimately, she may have to experience several trial and error phases before she finds the "correct" formula that will facilitate the proper actions needed to reach her preferred behaviors.

Case 4: Wild Woman

Preprogram Scores. Wild Woman (WW) is a 52 year old African-American female. The subject's preprogram CPA scores (Table 4.2.4.1) reflected average levels of motivation ($z = .57$) when compared to sample means and standard deviations (Table 4.1.1). She reported "fair" to "good" ratings on exercise adherence factors (Table 4.2.4.2) and measured 54% body image distortion, which corresponded to the 99.9th percentile (Table 4.2.4.3). This score suggested WW possessed an irrational perception of her body size. Perceived adequacy scores (Table 4.2.4.4) were measured at or below sample averages (Table 4.1.3) on all subscales except strength. All corresponding PIP subscales were rated as "important", producing a high, negative discrepancy score between the two scales (Table 4.2.4.5). This score represented low levels of physical and global self-esteem.

Table 4.2.4.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	50	57
z score	.57	1.57
% tile	72.00	95.00

Table 4.2.4.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

Factor	Preprogram		Postprogram	
	Score	Rating	Score	Rating
Predisposing	8	Good	11	Very Good
Enabling	3	Fair	7	Excellent
Reinforcing	5	Good	7	Excellent
Total	16	Good	25	Very Good

Table 4.2.4.3

Pre- and Postprogram BIDO Results

	Pre	Post
Actual Weight		
Ratio	1.32	1.34
Perceived Weight		
Ratio	2.03	1.39
% Distortion	54.00	4.00
z score	3.00	-.85
%tile	99.87	20.00

Table 4.2.4.4

Pre- and Postprogram PSPP and PIP Raw and Standard Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	18	.83	80	18	.83	80
SportImp	5	.30	62	6	.97	83
Condition	10	-1.22	12	18	.76	78
ConditionImp	7	1.10	86	7	1.10	86
Body	9	-1.20	12	11	-.67	25
BodyImp	8	1.71	96	8	1.71	96
Strength	19	1.20	88	18	.88	81
StrengthImp	5	-.01	50	7	1.55	94
PSW	10	-1.25	10	18	.84	80

Table 4.2.4.5

PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	1.0	0
Condition	-3.7	-1.0
Body	-5.0	-4.3
Strength	-1.3	-1.0
Total	-9.0	-6.3

Interview. In the preprogram interview, WW indicated she felt exercise was "most" important to overall health. She also agreed that she participated in physical activity for enjoyment. WW reported having been on 2 diet programs in the past 3 years. The subject claimed that she participated in aerobic activity, as defined by the ACSM, 2-3 times a week. She also claimed to "never" eat the daily recommended servings suggested by the ADA.

Fitness Test 1. The preprogram fitness test results (Table 4.2.4.6) revealed an estimated percent body fat of 40% and the predicted maximum VO₂ was 20 ml/kg/min. Walking was the subject's preferred mode of exercise. The subject also expressed interest in resistance activities. WW was encouraged to get adequate amounts of each type of activity, as well as to increase overall daily activity.

Self-Monitoring 1. WW was asked to monitor daily exercise and diet habits in an attempt to discover hidden patterns. For a 2 week period, she averaged 1 hour of aerobic exercise and 1 hour of muscular endurance exercise. WW's average weekly servings were

Table 4.2.4.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	134/90	120/74
Flexibility (in.)	18.75	19.00
% Body Fat	40.0	35.0
Max VO ₂ (ml/kg/min)	20.0	24.0
Muscular Endurance		
Push-ups	0	1
Curl-ups	3	6
Sit-ups	-	-
Weight (lbs.)	205	210

below those recommended by the ADA (Table 4.2.4.7).

Goals. The subject's daily goals included: (a) eating breakfast every day, (b) taking 1 piece of fruit to work every day, and (c) leaving the office for 1 hour during the day. Weekly goals were: (a) walking 30 minutes 3 times a week, (b) working out on resistance equipment twice a week, and (c) limiting cookie intake to 3 cookies, 4 days a week. WW chose not to reward herself, claiming that feeling better was enough of a reward.

Maintenance Session 1. The subject was unable to attend the first scheduled session due to a low back injury. This session focused on that incident and how it affected her behaviors. No goals were adjusted during this session. When she was asked how this had affected her program, WW replied:

I'm doing good, but for some reason I'm thinking that I got off track for those 2 weeks. When I wasn't able to do my exercising, it caused me to not feel like I'm not as on top of things as I should be. I did a self-assessment and thought I've got to start writing down what I'm eating.

Table 4.2.4.7

Early vs. Late Program Nutritional Weekly Averages

Group	ADA Recommended	Early	Late
Dairy	14	8.0	-
Meat/Fish/Eggs	14	15.0	-
Fruit/Vegetables	35	16.0	-
Bread/Cereal	42+	28.0	-

This was another subject who had stopped regularly recording daily habits after the first 2 or 3 weeks of the program. This was optional to them if they felt it wasn't as useful as another intervention. WW had come to the realization that this kind of monitoring may in fact be very helpful in discovering hidden patterns and effective methods to adjust these behaviors. She also indicated that she was scheduled for a doctor's visit to check her cholesterol in 2 weeks. When she was asked if this made her anxious, she stated, "The pressure of knowing that I'm going to the doctor and I so desperately want to get a good report, maybe that is subconsciously causing me to not be on top of things, but not out of control."

The subject was then asked to expound on her motivation level. She stated:

I feel good. I think I just need to get my routine worked out again. I was so motivated and impressed by the way I was feeling. Maybe I need to learn how to manage additional activities and interruptions in the routine.

WW was reminded how important it was to have flexible goals. She was encouraged to use other interventions in times of distress.

Maintenance Session 2. This session focused on modifying the subject's goals. WW was reminded to focus on process oriented behaviors and on increasing the frequency or duration of aerobic activity. She commented:

There are always things in my life that's going to dictate change, and I don't want to fall prey to that old habit again. I've got to work on, even in those high pressuring times when I feel like I've got to get something done and could just stay here one more hour to get it done...I have got to stop and say "Hey, quit, go work out.".

Plans to counteract these potential relapse situations were discussed. Simple interventions such as monitoring, self-talk, or prioritizing daily goals were possible actions WW could take to help her on these days. WW talked further about her own behavior, saying:

I like coming over here and working out. I know how crucial it is to maintain my health. That's just something that I have got to do, to establish that as a goal, regardless as to how busy we get. When asked if she had noticed any physiological changes, WW stated:

Well yeah, that's one problem in the past as far as diets have been concerned. When I would start to lose, I'd feel pretty good. I'd reach a certain point and would back off and get lax, not ever getting down to where I needed to be. I'm feeling somewhat that now, in that the scales say I've gained, but hell, I'm fitting a whole lot better in my clothes! I realize the benefits I have to gain from making the changes and following through. I feel better, I'm more energetic. I feel good about it. I'm convinced I would never ever diet. The scales don't mean anything to me anymore. I know what I need to do. I know that it works.

Self-Monitoring 2. Self-reported exercise levels indicated an increase in weekly activity averages. Aerobic activity increased to 2.0 hours per week.

Muscular endurance activity increased to 1.3 hours per week. WW did not monitor nutritional habits in the latter part of the program.

Postprogram Scores. The subject's postprogram CPA scores (Table 4.2.4.1) indicated a significant change in motivation level when compared to the preprogram raw score of 50 ($z = .57$). A postprogram score of 57 corresponded to the 95th percentile. All exercise adherence factors improved to "very good" or "excellent" ratings (Table 4.2.4.2). These changes perhaps resulted from increased knowledge and awareness as well as successful goal achievement. The postprogram BIDQ results indicated a large reduction in percent body image distortion. This improved from 54%, or the 99.9th percentile, to 4%, which corresponded to the 20th percentile (Table 4.2.4.3). This represented a much more rational evaluation of her body.

PSPP scores reported a variety of changes in subscale perceptions of adequacy (Table 4.2.4.4). The largest changes were in the condition subdomain and the physical self-worth subscale. The condition subscale score improved from 10 to 18, which corresponded to the

78th percentile. A score of 18 on the physical self-worth subscale produced an increase from the 10th percentile to the 78th percentile.

PIP scores were varied, resulting in a postprogram total discrepancy score of -6.3 (Table 4.2.4.5). This indicated: (a) a somewhat more balanced adequacy to importance ratio, and (b) elevations in physical and global self-esteem.

Fitness Test 2. The postprogram fitness test revealed that physiological changes had occurred in this subject. Body composition was reduced to 35% body fat and predicted maximum VO₂ increased to 24 ml/kg/min (Table 4.2.4.7). WW also brought the researcher a copy of her doctor's report of her cholesterol levels. In November of 1993, her total cholesterol was 274 and her triglyceride number was 154. Near the conclusion of the program, in May 1994, her total cholesterol had dropped to 225, and triglycerides had dropped to 116.

Postprogram Survey. WW reported in the postprogram survey that she valued the personal attention she received, as well as the program's attempt to individualize a plan to meet her needs. She disagreed

that she would have functioned better in a group setting. WW also disagreed that there was too much information presented to her or that the program was too complicated. The subject ranked education in nutrition as the most important component of her self-management plan, and program individualization was second in importance.

The interventions most frequently used by WW were exercise monitoring, relaxation, self-talk, and imagery (2-3 times/week). She did not use any intervention on a daily basis. Goal setting was ranked as the most important intervention, followed by monitoring, contracting and self-talk, respectively.

WW stated that she was very pleased with the overall results of the program, adding that she had, "better appreciation of what I need to do to live and maintain a healthier lifestyle.". The subject claimed that she would: (a) reestablish goals, and (b) monitor her diet, as a means of regaining control in the event of a relapse. Again, this demonstrated how she felt about monitoring progress, even though she discontinued the practice early in the program. This supported the

notion that sometimes trial and error is one of the best means of learning, and changing.

In response to the question, "In what areas have you made the most progress?", WW answered, "I have a new perspective on health and fitness in general which completely excludes "dieting". With both components, I know now, from experience, that this is the best way to maintain a healthier lifestyle."

It was possible to conclude from all of this information that WW experienced positive behavioral changes that will aid her in one day reaching her desired outcomes. She improved in motivation, adherence factors, self-esteem, and body image distortion with minor physiological changes. However, these changes were enough to reinforce the present patterns that will eventually lead to a healthier and more active lifestyle.

Case 5: Speedo

Preprogram Scores

Speedo, a 35 year old African-American male, was the only male in the study. His preprogram CPA score

($z = -1.43$) indicated a low level (Table 4.2.5.1) of motivation when compared against test sample means and standard deviations (Table 4.1.1). All adherence factors were rated as "fair" (Table 4.2.5.2). These scores suggested that Speedo did not possess levels of commitment and adherence supportive of behavioral changes. Speedo's BIDQ results reflected a body image distortion of 11%, which corresponded to the 82nd percentile (Table 4.2.5.3).

Speedo's PSPP scores (Table 4.2.5.4) represented below average levels of perceived adequacy when compared against test sample means and standard deviations (Table 4.1.3). Speedo's PIP scores ranked all 4 subscales as "important", thus producing a large, negative preprogram discrepancy score of -7.3 (Table 4.2.5.5). This suggested that all subscales were valued parts of Speedo's concept of general physical self-worth. Low PSPP adequacy scores, along with the PIP scores produce discrepancies indicative of low global self-esteem.

Interview. A preprogram interview revealed Speedo had been on 2 diet programs in the past 3 years. He

Table 4.2.5.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	38	41
z score	-1.43	-.94
% tile	8.00	18.00

Table 4.2.5.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

Factor	Preprogram		Postprogram	
	Score	Rating	Score	Rating
Predisposing	5	Fair	5	Fair
Enabling	3	Fair	3	Fair
Reinforcing	3	Fair	2	Poor
Total	11	Fair	10	Poor

Table 4.2.5.3

Pre- and Postprogram BIDQ Results

	Pre	Post
Actual Weight		
Ratio	1.39	1.32
Perceived Weight		
Ratio	1.55	1.65
% Distortion	11.00	25.00
z score	.92	2.0
%tile	82.00	98.00

Table 4.2.5.4

Pre- and Postprogram PSPP and PIP Raw and Standard Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	14	-.84	20	13	-1.10	12
SportImp	5	-.32	37	4	-.96	17
Condition	11	-1.40	8	11	-1.40	8
ConditionImp	6	.28	39	5	-.44	33
Body	10	-1.40	8	11	-1.10	13
BodyImp	6	-.01	50	5	-.37	35
Strength	12	-1.20	12	12	-1.20	12
StrengthImp	6	.50	70	4	-1.10	14
PSW	11	-1.70	5	12	-1.40	8

Table 4.2.5.5

PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	-.30	-
Condition	-2.30	-1.3
Body	-2.70	-1.3
Strength	-2.00	-
Total	-7.30	-2.6

felt that exercise was "very" important to overall health. However he was "undecided" whether a main reason he participated in physical activity was for enjoyment. Speedo claimed to "sometimes" eat the recommended daily servings as suggested by the ADA food pyramid. He also reported participating in aerobic activity, as defined by the ACSM, 0-1 times a week.

Fitness Test 1. The preprogram fitness test results estimated Speedo to have 25.4% body fat and a predicted maximum VO₂ of 35.6 ml/kg/min (Table 4.2.5.6). His preferred modes of exercise were walking and running. Speedo also expressed interest in muscular endurance training.

Self-Monitoring 1. The subject was asked to monitor daily exercise and eating habits in an attempt to assess present behaviors. In a 2 week time frame, Speedo reported weekly averages below the suggested servings in all food groups except the meat/fish/eggs group (Table 4.2.5.7). He also averaged 27 minutes of aerobic exercise for these 2 weeks.

Goals. From the information presented, daily and weekly goals were set for Speedo. The daily goals

Table 4.2.5.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	110/68	110/68
Flexibility (in.)	15.25	16.00
% Body Fat	25.40	23.70
Max VO2 (ml/kg/min)	35.60	34.00
Muscular Endurance		
Push-ups	23	28
Curl-ups	31	34
Sit-ups	-	-
Weight (lbs.)	199	190

Table 4.2.5.7

Early vs. Late Program Nutritional Weekly Averages

Group	ADA Recommended	Early	Late
Dairy	14	7.5	2.0
Meat/Fish/Eggs	14	17.5	12.5
Fruit/Vegetables	35	12.5	12.5
Bread/Cereal	42+	18.0	15.0

included: (a) bringing 2 pieces of fruit to work each day, (b) drinking 3, 8 ounce glasses of water each day, and (c) completing 10 minutes of abdominal and low back exercises each day. Weekly goals were as follows: (a) exercising 20 minutes, 3 times a week in his target heart rate zone, (b) making healthier choices when eating out, and (c) keeping detailed logs for time management purposes.

Maintenance Sessions. This subject attended no maintenance sessions. In the postprogram survey, he stated that his absences were due to work conflicts, being off work for 2 weeks, and moving to a new residence. Speedo admitted that these absences "broke the routine I was in, it's hard to get started again.". The subject did continue monitoring his habits throughout the absences.

Self-Monitoring 2. Late program weekly averages indicated this subject was still having difficulty obtaining a properly balanced diet (Table 4.2.5.7). Weekly servings were far below recommended servings for each food group with the exception again of the meat/fish/eggs group. Aerobic activity increased

slightly to 33 minutes/week. Clearly the absences from work affected his motivation to exercise. This allowed no opportunity for reinforcement of preferred behaviors or reasons to enhance adherence levels. The amount of exercise was far below what is recommended to produce physiological changes, especially in body composition and cardiovascular endurance.

Postprogram Scores. Postprogram CPA scores reflected slight improvement in Speedo's motivation to exercise (Table 4.2.5.1). This score ($\underline{z} = -.94$) was still below average commitment levels (Table 4.1.1). Speedo's level of motivation is not supportive of sustained optimal commitment levels. Exercise adherence factors were rated as either "fair" or "poor" (Table 4.2.5.2). This suggested that Speedo was still experiencing less favorable conditions than what was needed to facilitate positive changes.

The subject's body image distortion increased from 11% ($\underline{z} = .92$) to 25% ($\underline{z} = 2.0$). This is due to an elevated postprogram perceived weight ratio and decreased actual weight ratio (Table 4.2.5.3). This

indicated a continuation of distorted body perceptions, even through a period of slight weight reduction.

PSPP scores reported little change from preprogram scores (Table 4.2.5.4). However, PIP scores were lower, with only 2 of the 4 subscales being rated as "important". This resulted in a lower total discrepancy score (Table 4.2.5.5), indicating that 2 of the subscales (sport and strength) were no longer valued by Speedo. Low adequacy scores on these subdomains would not adversely affect his global self-esteem. Although this may be an improvement in one sense, the subdomain adequacy scores were still sharply below comparable averages (Table 4.1.3).

Fitness Test 2. Postprogram fitness test results (Table 4.2.5.6) revealed a 1.7% decrease in estimated percent body fat. Predicted maximum VO₂ also decreased from 35.6 to 34 ml/kg/min.

Postprogram Survey. Speedo reported that he valued the program's attempt to individualize a plan to meet his needs. He also valued the personal attention he received. The subject "strongly" agreed that he would have functioned better in a group setting. The latter

statement did not coincide with the first two statements of him finding value in the personal aspect of the program. Perhaps the individual sessions were intimidating to Speedo, or maybe he would have simply benefited from group support.

Speedo disagreed that the program was too complicated, or that too much information was presented to him. The subject ranked program individualization as most important to his self-management plan, and education in exercise ranked second.

The interventions most frequently used by the subject were exercise and nutrition monitoring (6+ times/week) Monitoring was ranked as the most important intervention followed by goal setting, rewards, and contracting, respectively. In response to the question, "In what areas have you made the most important progress?", Speedo wrote, "Physically, because of the changes that occurred. I still need to work on the psychological portion of the training."

In concluding this study, the subject did make some improvements toward positive changes. The information gathered in the postprogram survey suggested that this

subject was behaviorally oriented and perhaps would have benefited more from a "stricter" personalized monitoring program, one which demanded more exercise and required positive and/or negative reinforcers.

Case 6: Jolly

Preprogram Scores. Jolly is a 45 year old Caucasian female. The subject's preprogram CPA scores (Table 4.2.6.1) reflected levels of motivation ($z = -.56$) slightly below sample means and standard deviations (Table 4.1.1). She reported "good" and "very good" ratings on exercise adherence factors (Table 4.2.6.2). BIDQ results reflected 26% body image distortion, which corresponds to the 81 percentile (Table 4.2.6.3). This score represented a somewhat distorted perception of her body size.

PSPP perceived adequacy scores (Table 4.2.6.4) measured close to sample averages (Table 4.1.3) on all subscales. Jolly rated 3 of the 4 PIP subscales as "important". These PSPP and PIP scores produced a total discrepancy of -4.7 (Table 4.2.6.5).

Table 4.2.6.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	42	35
z score	-.56	-1.56
% tile	29.00	6.00

Table 4.2.6.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

Factor	Preprogram		Postprogram	
	Score	Rating	Score	Rating
Predisposing	9	Good	7	Good
Enabling	6	Very Good	4	Good
Reinforcing	5	Good	4	Good
Total	20	Good	15	Good

Table 4.2.6.3

Pre- and Postprogram BIDQ Results

	Pre	Post
Actual Weight		
Ratio	1.21	1.23
Perceived Weight		
Ratio	1.52	1.44
% Distortion	26.00	17.00
z score	.85	.15
%tile	81.00	56.00

Table 4.2.6.4

Pre- and Postprogram PSPP and PIP Raw and Standard
Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	13	-.35	36	15	.12	55
SportImp	4	-.37	35	4	-.37	35
Condition	15	.02	50	15	.02	50
ConditionImp	6	.40	66	6	.40	66
Body	12	-.43	33	14	.05	52
BodyImp	7	.93	82	6	.16	56
Strength	16	.33	63	17	.60	73
StrengthImp	6	.77	78	6	.77	78
PSW	16	.32	63	13	-.47	32

Table 4.2.6.5

PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	-	-
Condition	-1.00	-1.00
Body	-3.00	-1.40
Strength	-.70	-.40
Total	-4.37	-2.80

Interview. In the preprogram interview, Jolly indicated she felt exercise was very important to overall health. She agreed that she participated in physical activity for enjoyment. The subject reported having been on one diet in the past 3 years. Jolly claimed to participate in aerobic activity, as defined by the ACSM, 0-1 times per week. She admitted to "sometimes" eat the daily recommended servings suggested by the ADA.

Fitness Test 1. The preprogram fitness test results (Table 4.2.6.6) revealed an estimated percent body fat of 23%. Her predicted maximum VO₂ was 33 ml/kg/min. Jolly's preferred modes of exercise were aerobic videos and walking. The subject also expressed interest in participating in adequate amounts of muscular endurance training.

Self-Monitoring 1. Jolly only turned in exercise logs, choosing not to monitor nutritional patterns. She reported, over a 2 week period, a weekly average of 1.5 hours of aerobic activity and 1 hour muscular endurance exercise.

Table 4.2.6.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	94/64	100/74
Flexibility (in.)	22.50	23.00
% Body Fat	22.00	25.00
Max VO2 (ml/kg/min)	33.00	33.00

Muscular Endurance

Push-ups	20	30
Curl-ups	-	-
Sit-ups	26	40
Weight (lbs.)	166	168

Goals. Jolly's daily goals were as follows: (a) eating 3 appropriate snacks daily, (b) eating the recommended servings from the food pyramid, and (c) drinking 6, 8 ounce glasses of water every day. Weekly goals included: (a) exercising 30 minutes, 3 times a week in her target training zone, (b) attending a toning class or using a sculpting video once a week, and (c) performing crunches or push-ups while watching the television.

Maintenance Session 1. This was the only session Jolly attended. The session focused on modifying her goals and discussing intervention utilization. When asked how her goals were progressing. Jolly replied:

Well I'm not keeping this up as much as I should, with the water. I'm exercising 3 times a week, but I'm not necessarily doing aerobic exercise 3 times a week, which I need to do. But I'll tell you what has helped me a lot is the self-talk. And something else that really helps me a lot is the relaxation. I'm not using it daily, but when I do it helps.

Jolly was asked to further explain why she found these interventions useful. She stated:

I'm using a lot of imagery. I think that is just real powerful. A lot of times when I'm quiet and still, driving or something, I allow myself to do that and to visualize; or maybe it's a brief, fleeting moment, but it's consistent, it's daily. I can see that it's changing my thought processes, my actions.

When asked exactly how she was using self-talk, Jolly replied, " I have stickies inside of my daytimer, inside my desk drawer. Every time I open that desk drawer and every time I open that daytimer, I read those stickies.".

Self-Monitoring 2. Jolly's final exercise logs revealed a weekly average of 1 hour of cardiovascular exercise. This was down from the early program average of 1.5 hours. Jolly did experience medical problems during the latter part of the program which greatly affected her ability and willingness to exercise.

Postprogram Scores. CPA results indicated a large decrease in motivation (Table 4.2.6.1) from a

preprogram score of 42 ($\underline{z} = -.56$) to the postprogram score of 35 ($\underline{z} = -1.56$). Perhaps this was in response to her physical conditions, which forced her to reduce her exercise time, thus resulting in a slight weight gain. Exercise adherence factors were slightly lower, yet still rated as "good" (Table 4.2.6.2). BIDQ results (Table 4.2.6.3) indicated a reduction in body image distortion from 26% ($\underline{z} = .85$) to 17% ($\underline{z} = .15$). This reflected the subject's increased ability to rationally evaluate her body size. Perhaps this resulted from Jolly's frequent use of imagery and self-talk.

PSPP scores indicated slight improvements on all subscales, with the exception of the general physical self-worth domain (Table 4.2.6.4). These changes produced a reduction in the total PSPP/PIP discrepancy score from -4.7 to -2.8 (Table 4.2.6.5). Lower discrepancy reflected a more balanced adequacy/importance ratio.

Fitness Test 2. The postprogram fitness test results revealed slightly elevated body composition measures with increased body fat from 22% to 25%.

Predicted maximum VO₂ remained unchanged at 33 ml/kg/min. The subject did improve in the muscular endurance portion of the evaluation (Table 4.2.6.6).

Postprogram Survey. Jolly reported that she valued the personal attention she received in the program, and she valued the program's attempt to individualize a plan to meet her needs. Jolly disagreed that she would have functioned better in a group setting. She also disagreed that the program was too complicated or contained too much information.

Jolly ranked program individualization as the component most important to her self-management plan, with the personal sessions ranked second. The interventions most frequently used by Jolly were: (a) self-talk and imagery (6+ times/week), and (b) relaxation and exercise monitoring (2-3 times/week). Self-talk was ranked as the most important intervention, followed by relaxation, imagery and monitoring, respectively.

Jolly was pleased with the overall results of the program. She reported that she would utilize relaxation, self-talk, imagery, and monitoring to

reestablish control in the event a relapse occurred. In response to the question, "In what areas have you made the most important progress?", she stated, "Psychologically, the self-talk, relaxation, and imagery techniques I found to be very effective and I feel if I better managed my time along with incorporating these techniques, I would greatly benefit.".

In concluding this case, it was evident that Jolly benefited from the cognitive-behavioral techniques presented to her. Because of her medical condition during the program, it was difficult to determine to what degree her health affected these results. The improvement in body image and self-esteem indicated that psychological changes appeared without measurable physiological changes. For Jolly, perhaps it was more important to initially change the beliefs about health and fitness. Then these changes, in turn, may precede more prevalent behavioral changes.

Case 7: Scuba

Preprogram Scores. Scuba is a 39 year old Caucasian female. The subject's preprogram CPA score ($z = -1.7$) indicated a low level (Table 4.2.7.1) of motivation when compared against test sample means and standard deviations (Table 4.1.1). Exercise adherence factors were rated from "good" to "excellent" (Table 4.2.7.2) This suggested that the subject possessed adherence factors supportive of behavioral changes. Scuba's BIDQ results reflected a body image distortion of 54% (Table 4.2.7.3). This corresponded to the 99.9th percentile and indicated an extremely distorted body size perception. Scuba's PSPP perceived adequacy scores (Table 4.2.7.4) varied, and all 4 subscales were rated as "important" by PIP scores. These measures produced a total discrepancy score of -2.5 (Table 4.2.7.5).

Interview. In the preprogram interview, Scuba felt exercise was "very" important to overall health. She agreed that she participated in physical activity for enjoyment, but "hates to sweat". Scuba reported having been on 2 diets in the past 3 years and claimed to

Table 4.2.7.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	34	53
z score	-1.7	1.0
% tile	5.0	84.0

Table 4.2.7.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

Factor	Preprogram		Postprogram	
	Score	Rating	Score	Rating
Predisposing	9	Good	13	Excellent
Enabling	7	Excellent	8	Excellent
Reinforcing	6	Very Good	8	Excellent
Total	22	Very Good	29	Excellent

Table 4.2.7.3

Pre- and Postprogram BIDQ Results

	Pre	Post
Actual Weight		
Ratio	1.14	1.12
Perceived Weight		
Ratio	1.75	1.25
% Distortion	54.00	12.00
z score	3.0	-.23
%tile	99.87	41.00

Table 4.2.7.4

Pre- and Postprogram PSPP and PIP Raw and Standard Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	16	.36	64	15	.12	55
SportImp	5	.30	62	3	-1.03	15
Condition	13	-.48	32	18	.76	78
ConditionImp	5	-.30	62	7	1.10	86
Body	16	-.53	70	18	1.00	84
BodyImp	7	.93	82	7	.93	82
Strength	14	-.23	41	15	.05	52
StrengthImp	5	-.01	50	3	-1.57	6
PSW	18	.84	80	21	1.63	95

Table 4.2.7.5

PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	.30	-
Condition	-.70	-1.00
Body	-1.70	-1.00
Strength	-.40	-
Total	-2.50	-2.00

"regularly" eat the recommended servings suggested by the ADA. She also reported that she participated in cardiovascular activity, as defined by the ACSM, 0-1 times each week.

Fitness Test 1. The preprogram fitness test results (Table 4.2.7.6) revealed an estimated 31% body fat and a predicted maximum VO₂ of 32 ml/kg/min. Scuba preferred walking as a mode of exercise. She stated during the assessment that she recently had begun dancing lessons and playing golf.

Self-Monitoring. Scuba was asked to monitor daily exercise and dietary habits in an attempt to evaluate present behaviors. She claimed to be a vegetarian, but did eat fish. Scuba did briefly monitor her eating habits, however she never turned in any exercise or dietary logs. She stated that the behavioral techniques of monitoring were not as helpful to her as the cognitive-behavioral interventions.

Goals. Scuba's daily goals included: (a) walking 10-15 minutes every day, (b) eating dinner by 8:00 pm, and (c) completing 10 minutes of stretching and toning exercises. Her weekly goals were as follows: (a)

Table 4.2.7.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	100/70	106/70
Flexibility (in.)	20.0	19.75
% Body Fat	31.0	27.7
Max VO ₂ (ml/kg/min)	32.0	37.0
Muscular Endurance		
Push-ups	10	29
Curl-ups	20	33
Sit-ups	-	-
Weight (lbs.)	174	172

walking 20 minutes, 3 times a week, (b) completing 30 minutes of toning exercises once a week, and (c) preparing dinner at home twice a week.

Maintenance Sessions. Scuba attended no maintenance sessions. In the postprogram survey, she stated that her absences were due to work, travel, and scheduling conflicts. Scuba did not feel these absences adversely affected her progress.

Postprogram Scores. Scuba's postprogram CPA scores (Table 4.2.7.1) indicated a significant improvement in motivation level ($z = 1.0$). This suggested the subject was now able to sustain current commitment and motivation levels. All exercise adherence factors improved to "excellent" ratings (Table 4.2.7.2). Scuba's BIDQ results indicated a great reduction in body image distortion. Her scores improved from 54%, which corresponded to the 99.9th percentile, to 12%, which corresponded to the 41st percentile (Table 4.2.7.3). This reflected more rational body size evaluation at the end of the program.

PSPP scores reported various changes in subscale perceptions of adequacy. PIP scores also varied, with

only 2 of the 4 subscales rated as "important" (Table 4.2.7.4). These changes produced a slightly lower total discrepancy score of -2.0 (Table 4.2.7.5). This reflected that Scuba possessed a more balanced adequacy/importance ratio and elevated self-esteem.

Fitness Test 2. The final fitness test results (Table 4.2.7.6) revealed a decrease in body composition from 31% to 27.7% body fat. Predicted maximum VO₂ increased from 32 to 37 ml/kg/min. These results reflected increased activity levels, although no specific amounts of exercise were regularly reported.

Postprogram Survey. Scuba reported that she valued the program's attempt to individualize a plan to meet her needs. She also valued the personal attention she received. Scuba disagreed that she would have functioned better in a group setting. She also disagreed that the program was too complicated or that too much information was presented to her.

Scuba ranked the fitness test as the most important component of her self-management plan, with program individualization ranked second. She reported that she frequently used (6+ times/week) all behavioral and

cognitive-behavioral techniques, with the exception of rewarding for reinforcement. Scuba ranked goal setting as the most important intervention, followed by monitoring, relaxation, and contracting, respectively.

Scuba was pleased with the overall results of the program. When asked how she would regain control in the event of a relapse, Scuba replied, "Because I "own" this program and I feel like I have the tools to manage myself, or I know where to go for help.". In response to the question, "In what areas have you made the most progress?", Scuba answered, "Probably psychologically because now I feel I can do this.".

In conclusion of this case, it was evident that Scuba benefited from the techniques presented to her. She improved tremendously in motivation and adherence to exercise levels. Likewise, body image measures suggested the subject improved in her ability to rationally evaluate what is "just right" for body size. Scuba's physical self-worth measures indicated improvements which may continue to facilitate elevated levels of global self-esteem.

Case 8: Physical Wreck (PW)

Preprogram Scores. PW is a 46 year old African-American female. Her preprogram CPA scores (Table 4.2.8.1) indicated a low level of motivation ($z = -1.8$) when compared against test sample means and standard deviations (Table 4.1.1). Exercise adherence factors rated as "good" or "very good" (Table 4.2.8.2). PW's BIDQ results revealed 36% distortion, which corresponded to the 95th percentile (Table 4.2.8.3).

PW's PSPP scores (Table 4.2.8.4) represented below average levels of perceived adequacy when compared against sample means and standard deviations (Table 4.1.3). PW's PIP scores ranked none of the subscales as "important" to general physical self-worth. This indicated that the low adequacy scores on the PSPP scale did not adversely affect physical self-worth or global self-esteem. No discrepancy scores were produced since the subject ranked no PIP subscale as "important" (Table 4.2.8.4).

Interview. A preprogram interview revealed that PW had been on 1 diet in the past 3 years. PW felt exercise was "very" important to overall health, and

Table 4.2.8.1

Pre- and Postprogram CPA Results

	Preprogram	Postprogram
Raw score	33	47
z score	-1.8	.15
% tile	4.0	56.00

Table 4.2.8.2

Pre- and Postprogram Exercise Adherence Scores
and Ratings

	Preprogram		Postprogram	
Factor	Score	Rating	Score	Rating
Predisposing	8	Good	9	Good
Enabling	5	Good	4	Good
Reinforcing	6	Very Good	6	Very Good
Total	19	Good	19	Good

Table 4.2.8.3

Pre- and Postprogram BIDO Results

	Pre	Post
Actual Weight		
Ratio	1.21	1.22
Perceived Weight		
Ratio	1.65	1.49
% Distortion	36.00	22.00
z score	1.62	.54
%tile	95.00	70.00

Table 4.2.8.4

Pre- and Postprogram PSPP and PIP Raw and Standard Scores

Subscale	Preprogram			Postprogram		
	Raw	z	%tile	Raw	z	%tile
Sport	6	-2.00	2	7	-1.80	4
SportImp	2	-1.70	5	2	-1.70	5
Condition	7	-1.96	3	17	.51	70
ConditionImp	2	-2.40	1	5	-.30	38
Body	6	-1.87	3	15	.29	62
BodyImp	3	-2.17	1	4	-1.40	8
Strength	6	-2.45	1	12	-.79	21
StrengthImp	2	-2.35	1	3	-1.57	5
PSW	14	-.20	42	20	1.36	91

Table 4.2.8.5

PSPP and PIP Discrepancy Scores

Subdomain	Pre	Post
Sport	-	-
Condition	-	.67
Body	-	-
Strength	-	-
Total	N/A	.67

she indicated that she participated in physical activity for enjoyment. PW claimed to "sometimes" eat the recommended daily servings suggested by the ADA's food pyramid. The subject reported that she participated in aerobic activity, as defined by the ACSM, 2-3 times per week.

Fitness Test 1. The initial fitness test results (Table 4.2.8.6) estimated PW to have 32.3 % body fat and a predicted maximum VO₂ of 24.5 ml/kg/min. Walking was PW's preferred mode of exercise. She also expressed interest in including muscular endurance activity in her exercise regime.

Self-Monitoring 1. PW was asked to monitor daily exercise and dietary habits through weekly self-reports. This attempted to assess current behaviors associated with weight control. PW reported weekly averages of 1.67 hours of aerobic exercise and 47 minutes of muscular endurance exercise. She also reported lower nutritional serving averages than recommended by the ADA (Table 4.2.8.7).

Goals. PW's daily goals included: (a) eating something in the morning every day, (b) increasing

Table 4.2.8.6

Pre- and Postprogram Fitness Test Results

Fitness Component	Pre	Post
Blood Pressure	120/72	126/80
Flexibility (in.)	17.5	20.00
% Body Fat	32.3	27.5
Max VO2 (ml/kg/min)	24.5	40.0
Muscular Endurance		
Push-ups	0	3
Curl-ups	27	30
Sit-ups	-	-
Weight (lbs.)	158	160

Table 4.2.8.7

Early vs. Late Program Nutritional Weekly Averages

Group	ADA Recommended	Early	Late
Dairy	14	7.5	-
Meat/Fish/Eggs	14	6.0	-
Fruit/Vegetables	35	21.0	-
Bread/Cereal	42+	9.0	-

calcium intake, and (c) not eating sweet or salty foods when under stress at work. Weekly goals were as follows: (a) walking for 30 minutes, 3 times a week, (b) exercising with resistance equipment for 20 minutes at least once a week, and (c) eating more fruits and vegetables as snacks.

Maintenance Session 1. This session focused on goal modification and intervention use. When the subject was asked how her eating habits during stressful periods were progressing, PW replied, "I'm hanging with it. Stress doesn't affect me like it did since I've been exercising.". Interventions were discussed to probe for preference and frequency of use. PW stated:

Usually when I put my mind to doing something and I made a commitment to do it, then I'll do it, period. And that's what I've done. I've set my mind that I'm going to exercise for a certain amount of time and I recognized that I did eat when I was stressed, and I decided I wasn't going to do that.

The subject insinuated that she gained little benefit from the cognitive-behavioral interventions presented to her. She stated that she preferred goal setting as a means to focus her efforts.

Self-Monitoring 2. PW discontinued monitoring her dietary habits after setting her goals. She continued to monitor her exercise patterns, which averaged 2 hours of aerobic and 1 hour of muscular endurance exercises each week.

Postprogram Scores. Postprogram CPA scores (Table 4.2.8.1) reflected improvement in motivation from below average levels ($z = -1.8$) to more normal levels ($z = .15$) when compared against sample means and standard deviations (Table 4.1.1). Exercise adherence factors remained unchanged (Table 4.2.8.2) which indicated PW possessed motivation and adherence levels conducive to continuing changes. PW's percent of body image distortion decreased from 36% ($z = 1.62$) to 22% ($z = .54$), which was the result of a lower perceived weight ratio (Table 4.2.8.3). The decreased distortion related to a more rational body size perception in relation to what PW views was "just right" for her body size.

PSPP scores increased greatly (Table 4.2.8.4) to more normal averages (Table 4.1.3) for each subscale with the exception of the sport domain. PIP scores ranked one subscale, condition, as "important", which produced a total discrepancy score of .67 (Table 4.2.8.5). Typically, negative discrepancy scores are associated with lower levels of physical self-worth and global self-esteem. PW's positive discrepancy score was then associated with adequacy/importance ratios conducive to producing higher levels of self-esteem.

Fitness Test 2. The final fitness test results revealed an increase in predicted maximum VO₂ from 24.5 to 40 ml/kg/min. Body composition measures decreased from 32.3% to 27.5% body fat (Table 4.2.8.6).

Postprogram Survey. PW reported that she valued the personal attention she received. She also valued the program attempt to individualize a plan to meet her needs. PW "strongly" disagreed that she would have functioned better in a group setting. She disagreed that the program was too complicated or that too much information was presented to her.

PW ranked program individualization as the most important component of her self-management plan, with education in nutrition ranked second. Exercise monitoring was the only intervention PW frequently used (4-5 times/week). Goal setting ranked as the most important intervention, followed by rewards, monitoring, and contracting, respectively. PW was pleased with the overall results of the program, stating that she now has "a good foundation to jump start from."

In concluding this case, PW's test results indicated improvement in both the psychological and physiological realms of health. Motivation and adherence levels improved, as did self-esteem and percent of body image distortion. PW was more behaviorally oriented in her intervention preferences, which suggested that behavioral techniques improve not only physiological aspects, but psychological aspects (i.e., body image) as well. PW projected positive affect of this type of program which emphasized individuality of both physical and mental self-management techniques.

Chapter 5

Summary, Conclusions, and Implications

A summary of the results and conclusions about the case studies in general are presented in this chapter. Implications for future research are also suggested.

Summary

The purpose of this investigation was to determine the effects of behavioral and cognitive-behavioral interventions on lifestyle changes, focusing on weight control. An additional purpose of the present investigation was to explore the effectiveness of individualized, self-management programs, which emphasized proper exercise and nutrition for weight control. There were 8 participants who volunteered for this investigation (7 females, 1 male). The participants ranged in age from 27-56 years.

The information generated by the CPA (Corbin et al., 1987) indicated that 7 of the 8 subjects improved their motivation level. This increased commitment to exercise likely resulted from successful goal

achievement and physical improvements. These successes reinforced and supported continuing changes in activity level.

The information generated by the BIDQ (Mable, et al., 1986) indicated that, upon program completion, 6 of the 8 subjects reported lower amounts of body image distortion. This reflected the subjects' ability to rationally evaluate their body size in relation to what they perceive to be "just right" for themselves. Perhaps successful goal achievement led to increased self-efficacy, i.e., sense of control. Along with self-talk, this allowed the subjects to "rebuild" self-realities.

The information generated by the PSPP/PIP (Fox & Corbin, 1989) discrepancy scores indicated that all subjects reported improved adequacy/importance ratios. This suggested that the subjects' elevated physical self-worth positively affected global self-esteem. Two of the subjects reported positive discrepancy scores resulting from high perceived adequacy and importance ratios. This is indicative of extreme positive levels of self-esteem.

The information generated by the exercise adherence questionnaire indicated varying results among the subjects, with 5 of the 8 subjects reporting improvement. This suggested that improvements in motivation, body image, and self-esteem were connected with adherence in most, but not all, of the cases.

The information generated by the postprogram survey indicated that the interventions produced positive affect toward lifestyle changes. All subjects ranked program individualization as either the first or second most important component of their program. This suggested that the subjects valued the opportunity to participate in the individualizing of their program, thus gaining a sense of "ownership" over their self-management plan. Survey responses also indicated 7 of the 8 subjects reported goal setting as either the first or second most important intervention presented to them. Self-monitoring was the most frequently used intervention, followed by self-talk. No two subjects reported similar information on component importance, intervention importance, or frequency of intervention use.

These findings suggested that each subject operated under their "own program", viewing the importance of each component and intervention differently. Just as individual differences are important to exercise or nutritional programs, individual differences and preferences should be considered for optimal results.

The comparison of previous cognitive based program research (Abrams & Follick, 1983) with the present investigation suggested that the subjects in the present study could utilize such a program at the workplace. The subjects in the present study and the subjects in the Abrams and Follick (1983) study benefited from simple behavioral and cognitive beahvioral techniques used to make lifestyle changes. However, the subjects in the present study were not assigned to different maintenance training, as were the subjects in the Abrams and Follick (1983) study. Instead, the subjects in the present study attended maintenance sessions tailored to there indivdidual needs.

Conclusions

Based on the analysis of the interview, pre- and postprogram scores, and the postprogram evaluation survey, the following conclusions are offered.

1. The results of this investigation identified changes in body image and self-esteem during a period of individualized self-management which utilized both behavioral and cognitive-behavioral interventions.

2. The results of this investigation identified changes in motivation and adherence levels during a period of individualized self-management which utilized both behavioral and cognitive-behavioral interventions.

3. In most of the cases, the resulting psychological changes occurred with minimal or slight physiological changes.

4. The survey responses supported gradual lifestyle changes, attainable through self-management programs.

5. The survey responses supported subject preference of program individualization made possible through mutual agreements between the the subjects and the researcher on goal setting and contracting issues.

Implications for Future Research

Based on the results of this investigation, implications for further research are suggested.

1. The identification of personality variables that contribute to subject preference of either behavioral or cognitive-behavioral based programs. Perhaps verifying the subject's locus of control may identify those with external or internal orientations, therefore further individualizing that subject's program.

2. As suggested by Kirshenbaum (1992), the extension of the duration of program involvement may better monitor the evolution of belief and attitude changes, as well as determine long term commitment and adherence levels.

3. Further exploration of successful goal setting/achieving and the potential relationship with self-esteem may clarify the origination and perceived value of program "ownership".

4. Exploration of self-efficacy and the potential relationship to relapse prevention/recovery from high risk situations, is suggested.

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APPENDIXES

APPENDIX A

Informed Consent for the E.M.P.O.W.E.R. Program

The purpose of this study is to determine the effects of changes in body composition upon body image, self-esteem and motivation to exercise. The study consists of two phases. In phase one (education) you will complete both physical and psychological assessments necessary to aid the investigator in creating an individualized weight control program for you. For two weeks, you will complete a food diary that asks you to list all foods you eat and at what times you eat them. You will receive informative group lectures on the basics of nutrition and exercise to aid you in understanding the physiological domain of weight loss. For the remainder of phase one (6 wks) you will complete a weekly exercise log. You will meet on a weekly basis with the investigator to consult and implement psychological tactics for weight loss. These include goal setting, contracting, cognitive restructuring and relapse prevention. Based upon all your test scores and interviews, any of these interventions may be combined for your personal self-management program. Those chosen are agreed upon both both myself and the investigator. These will be integrated into a behavioral contract. Failure to comply with the contract will result in your termination as a subject.

Phase two is a 2 month maintenance phase. In this phase it is likely that you will begin to experience changes in body composition or relapses of previous behaviors. Sessions will be conducted on a biweekly basis.

This study focuses on lifestyle changes and offers direct benefits to you. You can potentially alter your body composition and learn to self-manage eating patterns and exercise behaviors. The risks to you include those involved with any exercise regime. The negative effects of relapse to previous behaviors are also possible.

Your identity as a subject will be kept confidential. Only the investigator and her major advisor will have access to all of your test records,

which will be stored at the investigator's residence. Fitness test results are accessible to Bill Linville and nutritional information to Anita Milstead, however this data will be anonymous, unless you wish otherwise. The psychological procedures will be monitored by Dr. Steve Chardos, head of Behavioral Sciences. If eating disorders or other mental health problems are suspected, you may have to complete further testing and possibly be withdrawn from this study. Individual sessions with the investigator will be audiotaped. These tapes will be coded so that anonymity is preserved for those transcribing the tapes. Upon completion of transcribing the data, the tapes will be erased. Data obtained for research does not identify individuals.

If you have any questions concerning this study or your role in it, please contact the project director, Paige Botts, WT-12-K, x-2385. Your participation in this study is voluntary and you may discontinue your participation at any time.

I have read and understand the explanation of this study and my role in it. I understand the risks of participation and my option to withdraw without penalty. I agree to participate.

Name _____ Date _____

Signature _____

Name: _____ Date: _____
 SS#: _____ Age: _____
 TVA X- _____
 TVA Address: _____

1. How often would work interfere with your exercise program each week?
0-1 2-3 4+
2. How would you rate the amount of support, regarding this program, do you receive from your peers?
 Excellent Very good Good
 Fair Poor
3. What do you consider as the single most important factor inhibit you from beginning any regular exercise /diet program?
4. Do you presently exercise with strength and conditioning equipment or attend a toning class?
(If so) How many times per week?
5. Here is a list of persons who are capable of offering social support with your new program. Which one do you consider to have the most influence on you? Spouse/partner Friend
 Parent Child Co-Worker
6. How important do you feel exercise is to overall health?
Most Very Somewhat Not at All
7. How many exercise or diet programs, either prescribed or self-administered, have you not successfully completed within the past three years?
0-1 2-3 3-4 5+
8. How many did you complete, but did not maintain the results?
0-1 2-3 3-4 5+
9. What characteristic of your supervisor would you single out to best describe his/her personality?

10. The ACSM recommends exercising at least 3 times/week, for a duration of 20 minutes or longer, in your THR zone for improved cardiovascular fitness. According to this definition, how many times a week do you exercise now?
0-1 2-3 4+
11. Excluding job factors, tell me three other barriers that make it difficult for you to adhere to a healthy exercise or nutritional program.
12. How supportive is your supervisor on non work related activities you are involved in?
Very Somewhat Rarely Never
13. Which of the following exercise conditions do you prefer most?
Alone With 1 friend/spouse With a Group
14. How would you rate your job's general level of stress?
Very Somewhat Rarely Never
15. When exercising, how would you rate the support you receive from your significant other?
Excellent Very Good Good Fair Poor
16. What feature of exercise would you single out as the one you like most?
Why?
17. I feel that I am in control of my exercise and nutritional habits.
Always Sometimes Rarely Never
18. I eat three regular meals a day that contain the recommended servings from the four basic food groups. Never Sometimes Often Regularly
19. I limit the amount of saturated fat (solids), salt, and simple sugars from my diet.
Never Sometimes Often Regularly

20. I make time for leisure and recreation.
Never Sometimes Often Regularly
21. One of the main reasons I do regular physical activity is because I enjoy it.
Strongly agree Agree Undecided Disagree Strongly disagree
22. I enjoy taking part in physical activity because it helps me relax and get me away from the pressures of daily living.
Strongly agree Agree Undecided Disagree Strongly disagree
23. Most physical activities are too difficult for me to enjoy.
Strongly agree Agree Undecided Disagree Strongly disagree

APPENDIX C

EXERCISE PHYSIOLOGY

COMPONENTS

1. Flexibility - Range of motion about each joint
2. Body Composition - Relativity of body fat to lean body weight
 - a. Percent body fat
 - b. Waist/hip ratio
3. Cardio Respiratory Endurance - How well the Heart, Lungs, and Blood Stream work together to extract VO₂ in the blood stream
4. Muscular Strength - Weight at 1 RM
5. Muscular Endurance - Repeat repetitions with a single weight in a given time period

FACTORS THAT INFLUENCE FLEXIBILITY

1. Stretching
 - a. Static - A stretch you hold for at least 15 seconds
 - b. Ballastic - Jerky, bouncing stretch. Stay away from this type

It is better to do light stretching before you exercise, but the bulk of stretching should be done after the cardiovascular session since this is the time when the muscles are warm and still pliable.

FACTORS THAT INFLUENCE BODY COMPOSITION

1. Exercise)
) You have control over these
2. Diet)
3. Metabolism
4. Heredity
5. Age

FACTORS WHICH INFLUENCE CARDIOVASCULAR FITNESS

1. Frequency
2. Intensity - (Carvonen Method)
3. Time
4. Type

OBLA - Onset of Blood Lactic Acid

Is the time when the accumulation of Blood Lactic Acid is greater than the rate of removal in the blood stream

What happens with this increased, continued cardiovascular work:

1. Decrease in BP
2. Increase in HDL
3. Decrease in Total Cholesterol
4. Decrease in LDL
5. Decrease in Triclyérides
6. Increase in Red Blood Cells
7. Decrease in resting HR
8. Increase in Cardio output

FACTORS WHICH INFLUENCE MUSCULAR STRENGTH

1. Frequency - 3 times per week
 - a. Strength - 5 to 8 repetitions
 - b. Toning - 10 to 15 repetitions
 - c. Endurance - 15 to 20 repetitions
2. Sets - 1st week
2nd week
3rd week
4th week
3. How Fast - 1st movement: 2 seconds
2nd movement: 4 seconds
4. Rest between sets - 1 to 2 minutes

-3-

FACTORS THAT INFLUENCE MUSCULAR ENDURANCE

1. Repetitions
2. Frequency

TOTAL SOURCES IN THE BODY

1. Anaerobic Metabolism
 - a. ATC-PC - 0 to 30 seconds
 - b. Glycolysis - 30 seconds to 3 minutes
2. Aerobic Metabolism - 3 minutes to 60 minutes
3. Carbohydrates and fats
 - a. First 10 to 15 minutes depending on the intensity both fuels are used on a pretty even basis.
 - b. Beyond 15 minutes the fats are used more prominently.

APPENDIX D

Characteristics of Your Workout (List the activities, specific exercises, time of day, eating habits, and mood before and after.)		
Monday	Tuesday	Wednesday
Thursday	Friday	Saturday
Sunday	Program Evaluation. Fill in weekly for 2 consecutive weeks after manipulating your program. Reevaluate any modifications.	

APPENDIX E

Nutrition and Weight Control

6 Nutrient Classes

1. Water :
 - a. most essential of all elements
 - b. necessary for energy production and waste eliminatio
 - c. Dehydration reduces endurance and increases the risk of heat exhaustion
2. Minerals (Inorganic):
 - a. Major minerals: Ca, P, Mg, Na, Cl >100 mg/day
 - b. Minor minerals: Fe, Z, Se, Ca, I <100 mg/day
Ca and P builds bones and teeth
Zinc = Insulin Iron = Hemoglobin
3. Vitamins (Organic)
 - a. Fat soluble: A, D, E, K - stored in liver as fat (excess = toxic effects)
 - b. Water Soluble: C & B complexes
 - c. Function as metabolic regulators
4. Proteins :
 - a. Needed for growth and repair
 - b. Not normally used for fuel
 - c. Amino acids - 9 essential to health
 - d. Complete proteins: meat, fish, eggs, poultry
 - e. Incomplete proteins: vegetables and grains
 - f. 1 gm = 4 kc - 12% of total calories consumed
5. Fats (Lipids)
 - a. Most concentrated source of energy
 - b. Saturated is solid at room temp.
 - c. Unsaturaated is liquid at room temp.
 - d. Polyunsaturated help lower blood cholesterol
 - e. 1 gm = 9 kc - 30% of total calories consumed
6. Carbohydrates
 - a. Most readily available source of energy
 - b. Stored as glycogen
 - c. Complex = fruits, vegetables, breads, cereals
 - d. Simple = sugar, no other nutritional value

APPENDIX F

Dietary Patterns Questionnaire

Yes	No	
_____	_____	1. Do you eat regular meals?
_____	_____	2. Do you eat breakfast daily?
_____	_____	3. Do you eat lunch regularly?
_____	_____	4. Do you get 5 servings daily from the bread/cereal/pasta/grain group?
_____	_____	5. Do you limit your daily intake of simple carbohydrates (sweet desserts, beverages) to two or fewer servings?
_____	_____	6. Do you limit your daily intake of meat/eggs/poultry to two 3 ounce servings?
_____	_____	7. Do you limit you daily intake of fats and fatty foods (butter, salad dressing, whole dairy products) to no more than 3 per day?
_____	_____	8. Do you limit the amount of saturated fat in your diet?
_____	_____	9. Do you salt foods both while cooking and at the table?
_____	_____	10. Do you get at least 5 servings daily from the fruit and vegetable group?
_____	_____	11. Do you drink at least eight 8 ounce glasses of water daily?
_____	_____	12. Do you get adequate minerals in your diet without a supplement?
_____	_____	13. Do you limit your consumption of caffeine-containing beverages/foods to 2-3 servings per day?

Rating Scale

Score	Rating
11-13	Very Good
10-11	Good
8-9	Marginal
<7	Poor

APPENDIX G

Breakfast foods	Amount	Calories/Fat	Food Servings
			Dairy Group ☐ ☐ Meat/Fish/Eggs ☐ ☐ Vegetables/Fruit ☐ ☐ ☐ ☐ Breads/Cereals ☐ ☐ ☐ ☐ ☐ ☐
Lunch foods	Amount	Calories/Fat	Food Servings Dairy Group ☐ ☐ Meat/Fish/Eggs ☐ ☐ Vegetables/Fruits ☐ ☐ ☐ ☐ ☐ Breads/Cereals ☐ ☐ ☐ ☐ ☐ ☐
Dinner foods	Amount	Calories/Fat	Food Servings Dairy Group ☐ ☐ Meat/Fish/Eggs ☐ ☐ Vegetable/Fruits ☐ ☐ ☐ ☐ ☐ Breads/Cereals ☐ ☐ ☐ ☐ ☐ ☐
Snack Foods	Amount	Calories/Fat	Food Servings Dairy Group ☐ ☐ Meat/Fish/Eggs ☐ ☐ Vegetable/Fruits ☐ ☐ ☐ ☐ ☐ Breads/Cereals ☐ ☐ ☐ ☐ ☐ ☐
Total Calories for the Day =			

APPENDIX H

GOAL SETTING TECHNIQUES

1. Subjects will specify the tasks to be done and clarify the reasons for starting this program.
2. The subject and the consultant will determine how progress will be evaluated. Possibilities are contracts, records, logs and public charting of group and individual progress.
3. Subjects will learn how to identify the specifics of the target behavior that they wish to reach. The person will be educated in distinguishing daily and weekly goals (process orientated) which require immediate reinforcement equal in strength to the attained goal. Long-term or outcome oriented goals will also be set and reinforced appropriately.

Example:

length of workout _____ min.	=	daily exercise goal
workouts per week _____	=	weekly exercise goal
attain ____% body fat _____	=	long-term fitness goal

4. Subject and consultant will specify a time period in which to reach each goal.
5. The individual will be encouraged to write a weekly exercise program, varying the types of activities along with intensity of exercise within each workout. They will be encouraged to also keep monthly records for self-management purposes and reinforcement. Subjects are required to keep logs of actual workouts (calories expended) to compare with nutritional logs (calories consumed).
6. Subjects will need to be able to modify their program periodically and readjust ineffective goals.

APPENDIX I

**PERSONAL HEALTH AND FITNESS CONTRACT
EMPOWER PROGRAM**

I, _____ hereby set forth to achieve _____ the target behavior agreed upon by myself and my consultant. To assist me in my pursuit of positive life-style changes, I agree to comply with this format of self-management to aid me in attaining my goal(s) by _____ (target date). I understand that my target behavior has been subdivided into several daily and weekly process goals, which are the focus of my effort.

I will pursue the following daily goals:

1. _____
2. _____
3. _____

If I successfully complete these goals I will receive _____ or _____ as my daily reward.

I will pursue the following weekly goals:

1. _____
2. _____
3. _____
4. _____

If I successfully complete these weekly goals I choose to receive _____ or _____ at the time of goal completion.

I agree to keep detailed, daily exercise and nutrition logs during the initial educational phase of 2 months. During the maintenance phase, I agree to keep similar logs on a weekly basis. I will be truthful and accurate in these logs _____ (initials). These logs will be reviewed weekly by my consultant. Incomplete logs will not be reviewed, and if I turn in two consecutive incomplete logs, I understand that this contract will be terminated and all services withdrawn _____ (initials). However, I may choose to

discontinue this practice if I feel I am gaining no benefit from it. I will receive _____ as a bonus reward upon completion of Phases 1 & 2. If I do not complete either phase I agree to _____.

Client: _____

Date: _____

Consultant: _____

Physiologist: _____

Dietitian: _____

APPENDIX J

**THOUGHT STOPPING TECHNIQUES AND POSITIVE
SELF-TALK****Steps to Self-Growth**

1. Subject will learn how to recognize self-defeating statements.
2. Subjects will be asked to monitor and log the frequency of negative thoughts that occur. This will enable them to locate potential patterns to change.

Thought Stopping

1. The subject will be educated that this technique prevents the development of habitual negative thought patterning or reduces the effectiveness of preexisting patterns.
2. The subject will learn to select a frequently occurring thought that they wish to extinguish.
3. The subject will practice interrupting the thought. First, external using external cues such as stop signs, bells or whistles. After becoming comfortable with this method, the subject will be encouraged to move to a more internalized, personal cue system.
4. The subject will generate a list of true, efficacy-enhancing positive thoughts that are relevant to the situation. Such affirmations allow the client to create a supportive reality with statements that are always positive, in present tense and personal.
5. The subject will be encouraged to read their lists at least twice a day for a period of time in order to become familiar with the terms and applying them to their own selves.

APPENDIX K

POSITIVE AFFIRMATIONS

Affirmations are short, positive statements about yourself. They are designed to reinforce changes you are trying to make in your lifestyle.

They are in the present tense, as if the desired behavior has already occurred.

They work best when used 2 or 3 at a time, repeated several times a day.

- * I am a grown-up person.
- * I am intelligent and sensitive.
- * I am in control of my life.
- * I choose what I want.
- * Only I am responsible for my life.
- * I am a worthwhile person.
- * When I do something good, I congratulate myself.
- * When I make a mistake, I forgive myself.
- * I make reasonable plans for the future.
- * I ignore things in the future that are beyond my control.
- * I enjoy food, but it is only moderately important to me.
- * I eat just enough to stay healthy, active, and feeling good.
- * I seldom think about food between meals.
- * I always know the instant I'm full and stop eating then.
- * I'd rather talk to a friend than eat.
- * When I'm bored, I go for a walk instead of eating.
- * I seldom weigh myself or think about my weight.
- * I enjoy my exercise program.
- * I have a strong and healthy body.
- * I feel great after I exercise.

Use these or other affirmations to negate undesirable behavior or negative thinking. Put them in your own words!! You will find that the more you use them, the fewer negative thoughts will reoccur.

APPENDIX L

Progressive Relaxation : Long Form

Taken from: The Mental Athlete. Kay Porter and Judy Foster. New York, NY: Wm. Brown Pub, 1986.

If possible find a quiet, comfortable place to sit or lie. Begin to relax, center your body parts and clear your mind. Imagine your center of gravity located 2 inches your navel. This will make you feel calm and relaxed and will enhance you sense of balance and strength. Progressive relaxation is started on your dominant side. Begin by tensing your dominant arm. Close your eyes and focus on your breathing. Inhale deeply, hold it for a moment, and exhale from your belly up to your chest. Inhale, hold, exhale. Feel your body and mind letting go.

Beginning with the dominant hand and forearm, make a fist, hold it feeling the tension in your arm, and let go, completely relaxing. Make a fist with your other hand, hold it, let go. Moving to your head, tense your jaw and forehead, hold, and let the tension go, feeling it float away. Breathe. Hunch your shoulders up around your ears, hold, let them go and feel a sense of relaxation begin to flow downward into the floor. Breathe and move your awareness to your abdominal. Slowly contract your muscles, hold, and release. Now to the dominant leg. Push your heel into the floor, hold feeling the tightness in your thigh, let go. Point your toes ahead of you, feeling your calf tighten, release. Move slowly to the other leg. Push your heel into the floor, hold, release. Point your toes ahead of you, hold, release, feeling all tension leaving your body and awareness. Inhale new energy and vitality; exhale tiredness and tension.

APPENDIX M

Imagery

1. Imagine yourself working out. Mentally go through each step of your exercise program: warm-up, stretching, etc.
2. Imagine yourself enjoying your workout and feeling better as a result of exercise.
3. These images should be personal. Try different settings for your imagery:
 - 1st person - through your own eyes
 - 3rd person - watching yourself from another point of view
4. Do these exercises for short periods (3-5 minutes) about 3 times a day.
5. If at any point, something "goes wrong" in your mind's eye, remember your positive self-talk or key words to refocus. Let go of any distractions.

Other uses:

- Help you overcome high-risk situations (vacation)
- Organize your day better (time management)
- Increase coping skills and commitment levels
- Overcome negative self-talk
- Deal with physical fatigue

APPENDIX N

RELAPSE PREVENTION**STAGE 1: ENHANCING MOTIVATION AND COMMITMENT**

This stage, as suggested by Brownell et. al, involves interventions designed to increase levels of motivation, commitment and maximize readiness for change. The introduction of contingency management procedures appears in this stage, if it has not previously been suggested. These procedures will aid the individual in preparation of a possible lapse or relapse.

Screening for motivation and commitment produces two benefits for the practitioner. First, it allows the consultant to more accurately match individuals to a program best suited for that person. Secondly, because a relapse can produce unfavorable physiological consequences, one target in this stage of prevention, is the need to focus on reducing the demoralizing consequence of failure. Attempting to prevent "unnecessary" failures may help convince the client that their problem is actually curable.

Brownell et. al., suggests two methods of screening for program placement. Behavioral tests may be used in a screening battery prior to the initial phase. The consultant can also choose to set criteria that must be met in order to participate in the program. Another approach is to generate a motivational rating scale to assess desire to achieve target behavior. In the present study, I have chosen to administer the Commitment to Physical Activity Scale to assess level of motivation and have integrated criteria for participation into a contingency contract, specifically designed for each client.

STAGE 2: INITIAL BEHAVIOR CHANGE

Most of a client's high-risk situations are likely to occur in this second stage. Therefore, three areas that should be covered in this initial treatment, include education in each of the following interventions: (1) decision making, (2) cognitive restructuring, and (3) coping skills. Decision making enables the individual to more accurately analyze personal and environmental determinants of relapse.

They also decide which coping skills to use in situation specific events considered to be at high-risk for that individual.

Cognitive restructuring teaches the person how to interpret events in a rational way so they can respond to any crisis in a constructive manner. Finally, instructing the individual in coping skills allows to person to effectively gain or regain control in certain situations. A cognitive approach in this program will include thought stopping techniques and positive self-talk. A more behavioral method that may also be applicable involves awareness of distracting activities to "desensitize" the individual from perceived or real risks.

STAGE 3: MAINTENANCE

This stage has previously been ignored in the literature as an intervention period. Brownell et. al., propose that the maintenance phase is legitimate area where three interventions are appropriate. It is suggested that monitoring be continued throughout this phase. This may become important in identifying potentials for a lapse to occur thus perhaps preventing unnecessary relapses. It is in the maintenance stage where the enlistment of social support is most beneficial. Clients will be educated on who can provide them with the proper support they need and how to avoid negative effects of inappropriate support systems (e.g. spouse may be a source of positive or negative support). In the present program, clients will be encouraged to enlist support from their managers or supervisors as well as peers. Finally, emphasis will be directed toward the individual self-managing gradual life-style changes and how to detect the need to reinstate self-monitoring and reinforcement after the supervised maintenance phase is completed. To enhance these efforts one method that will be conducted with each individual in this study is a programmed relapse. After acquiring coping skills, the individual will be presented with a supervised relapse. At this point, the client will attempt to demonstrate their self-management skills to prevent this lapse from becoming a full-blown relapse.

RELAPSE PREVENTION

Recovery With Self-Management

1. Lapse-- reemergence of a previous habit that may or may not lead to a relapse.

The Individual's response to the lapse determines if relapse will occur. This is often defined by the perceived loss of control. Causes may be physiological, psychological, or social.

2. Relapse (outcome) vs. Lapse (process)

relapse - dichotomous view (either/or)

lapse - can be seen as a backsliding - implies a less serious consequence.

Corrective action can be taken!!!

A binge DOES NOT have to precipitate a relapse.

3. Coping Processes

An absence of coping responses leads to a decrease in self-efficacy. This can lead to use of the substance, which tends to lead to an abstinence violation effect. This is a loss of control that follows a violation of self-imposed rules.

Attributions for abstinence violation effect : persons who relapse tend to make more internal (character) attributes.

A stage model of relapse is in itself helpful. Determine and monitor the time prior to the lapse, the actual lapse, and the period of relapse/coping.

A relapse can provide valuable information and experience.

**There are negative effects to a full blown relapse involving weight changes.

It is best to use a programmed (monitored) relapse for your needs.

4. Determinants /Predictors of Lapse and Relapse

Individual and Interpersonal

1. Negative emotional states (most common is anxiety)

2. Inadequate motivation : external orientation - symbolic effort
internal orientation - real effort

3. Response to treatment : compliance to the program e.g., self-monitoring
**A moderate degree to struggle with adherence will enable you to cope with future setbacks.

5. Coping Skills 1) Distraction control; 2)Relaxation and imagery; 3)self-talk and
4) Cognitive "threshold" of weight regain

6. Environmental/Social Factors

1. Social support - stressful interpersonal relationships can hinder progress

2. Stimuli/External Contingencies

Lapses tend to be associated with social factors while relapses tend to be associated with individual factors. (Need for realistic situational analysis)

APPENDIX O

E.M.P.O.W.E.R. Survey

Please circle the number that corresponds with how you feel about each statement. Additional space is provided below each statement for any comments you have.

Strongly Disagree = 1
 Disagree = 2
 Neutral = 3
 Agree = 4
 Strongly Agree = 5

- | | | | | | |
|---|---|---|---|---|---|
| 1. I value this program's attempt to individualize a self-management plan to meet my needs. | 1 | 2 | 3 | 4 | 5 |
| 2. I value the personal attention I received. | 1 | 2 | 3 | 4 | 5 |
| 3. There was adequate focus on the individual. | 1 | 2 | 3 | 4 | 5 |
| 4. There was too much emphasis on the individual. | 1 | 2 | 3 | 4 | 5 |
| 5. I would have functioned better in a group setting. | 1 | 2 | 3 | 4 | 5 |
| 6. The program was not long enough. | 1 | 2 | 3 | 4 | 5 |
| 7. There was too much information presented to me. | 1 | 2 | 3 | 4 | 5 |
| 8. I found all of the information relevant and applicable to lifestyle change/management. | 1 | 2 | 3 | 4 | 5 |
| 9. The meetings were too long. | 1 | 2 | 3 | 4 | 5 |
| 10. The meetings were difficult to attend. | 1 | 2 | 3 | 4 | 5 |
| 11. The program was too complicated. | 1 | 2 | 3 | 4 | 5 |
| 12. The entire staff (Anita,Bill,Paige) were readily available. | 1 | 2 | 3 | 4 | 5 |
| 13. The entire staff was capable of answering my questions. | 1 | 2 | 3 | 4 | 5 |

With 1 = most important, rank the following components of E.M.P.O.W.E.R. in order of IMPORTANCE TO YOU and YOUR self-management program:

- _____ Education in Exercise
- _____ Education in Nutrition
- _____ Fitness Test
- _____ Personal Sessions
- _____ Program Individualization

Please rank this list of techniques by the FREQUENCY of use on a weekly basis. You can use each number more than once.

6+ times per week = 1
 4-5 times per week = 2
 2-3 times per week = 3
 0-1 times per week = 4

- _____ Exercise Monitoring (logs)
- _____ Nutrition Monitoring (logs)
- _____ Relaxation
- _____ Rewards (daily)
- _____ Self-Talk / Positive Affirmations
- _____ Visualization / Imagery (for enhancing self-efficacy, improve techniques or behaviors)
- _____ Other _____

Please rank each technique in ORDER OF IMPORTANCE to you.

1= Most important 7= Least important

- _____ Contracting
- _____ Goal Setting
- _____ Monitoring Progress (logs)
- _____ Relaxation
- _____ Rewards
- _____ Self-Talk / Positive Affirmations
- _____ Visualizations/ Imagery

Are you pleased/disappointed with the overall results of this program?
 Please elaborate.

A) Do you feel the program gave you the tools to reach your long term goals? Do you feel comfortable using these tools?

B) If you were disappointed, what could the researcher have done to change this?

C) What could you have done differently (if anything)?

Records show you attended _____ maintenance sessions out of a possible 3 that could have occurred.

What was the main reason for any absences?

How do you think this affected/could affect your program now or in the future?

Do you feel confident that, in the event of a lapse or relapse, you could efficiently and effectively regain control over your behavior?

Why or why not?

If you chose to reestablish control, what would be a possible plan of action that you would most likely take?

Do you feel the pre- and post-program scores accurately represent any changes that have occurred?

If not, why?

Looking back to your previous behaviors, do you feel the methods presented in this program can help you reach your preferred behaviors and maintain them?

In what area(s) of your lifestyle (physically, psychologically, socially, other) do you think you have made the most important progress in? Please explain.

VITA

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Kimberly Paige Botts was born in Cleveland, Tennessee, on January, 4, 1970. She attended elementary school in Cleveland and graduated from Cleveland High School in May 1988. From 1988 to 1990, she attended the University of Tennessee, Knoxville. In the Spring of 1991, she transferred to the University of Tennessee, Chattanooga, and received a Bachelor of Science degree in Psychology in December, 1992. She returned to the University of Tennessee, Knoxville in January 1993 to accept a graduate research assistantship. She will receive a Master of Science degree with a major in Human Performance and Sport Studies in August, 1994.