

MAINTENANCE OF WEIGHT LOSS:  
THE ROLE OF SELF-EFFICACY AND COPING  
STRATEGIES IN RELAPSE PREVENTION

by

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## ABSTRACT

Because there can be serious health and social consequences to obesity, the need for effective treatment programs is great. So far researchers in the field have been more successful in improving the short-term effectiveness of treatment programs for weight loss than the likelihood of long-term maintenance. This study investigated the effects of a 4-week non-diet maintenance intervention program for 59 female participants who had successfully reached a target goal weight, maintained their loss for at least six months, and had moderately high levels of concern about future maintenance. Two treatment conditions were compared, a maintenance intervention (MI) and a relapse prevention intervention (RPI) with a waiting list serving as a control group. Measures of self-efficacy and coping were taken before and after treatment, and by mail at a 6-week follow-up for the 2 treatment conditions; the waiting list was tested at corresponding time intervals without intervening treatment. It was expected that levels of self-efficacy and the relative use of problem-focused coping would increase from pretest to posttest for both treatment conditions compared with the waiting list and that only the relapse prevention intervention group would maintain these increases from posttest to follow-up. No such significant differences were found among the groups on the dependent measures, however, as hypothesized, problem-focused coping at posttest was positively correlated with

levels of self-efficacy at follow-up. When clinical significance was assessed, individual participants in both treatment conditions showed improvement in self-efficacy (MI, 36%; RPI, 28%), and relative use of problem-focused coping (MI, 22%; RPI, 33%). In addition, correlational findings were similar to those of other maintenance studies (i.e., smaller weight regains were associated with higher levels of exercise and regular monitoring of weight). It was concluded that the relapse prevention treatment had not produced the desired effect of raising levels of self-efficacy and increasing the relative use of problem-focused coping, but also that the program's objectives had been too ambitious for a 4-week program. The relationship between self-efficacy and problem-focused coping found in this study indicates that this is a fruitful area for further investigation in the development of effective intervention programs for successful dieters at risk of relapse.

## TABLE OF CONTENTS

	page
Abstract .....	ii
Table of Contents .....	iv
List of Tables .....	vii
List of Figures .....	viii
Acknowledgements .....	ix
Introduction .....	1
Obesity and Weight Loss Maintenance .....	1
Relapse Prevention .....	3
Self-Efficacy in Relapse Prevention .....	5
Coping in Relapse Prevention .....	5
Relapse Prevention in Weight Loss Treatments .....	7
General Hypotheses for the Study .....	8
Literature Review .....	10
Obesity and Treatments .....	10
Correlates of Successful Maintenance .....	13
Understanding the Relapse Process .....	15
Self-Efficacy and Coping in Relapse Prevention ....	17
Self-Efficacy in Weight Loss and Maintenance .....	19
Coping in Weight Loss and Maintenance .....	24
Relapse Prevention Training .....	29
Development of a Maintenance Treatment Program ....	32
Evaluating a Maintenance Treatment Program .....	38
Purpose of the Study .....	41
Hypotheses .....	43

Method .....	44
Subjects .....	44
Design and Procedure .....	47
Dependent Measures .....	51
Eating Self-Efficacy Scale .....	51
Ways of Coping Checklist .....	53
Ancillary Measures .....	56
Therapist Qualifications .....	56
Treatments .....	57
Data Analysis .....	58
Results .....	60
Group Comparability .....	60
Attrition .....	62
Pretest Dependent Measures .....	63
Expectations of Treatment Effectiveness .....	67
Hypothesized Treatment Effects .....	68
Dependent Measures: Correlations .....	72
Clinical Significance .....	76
Discussion .....	81
Dependent Measures Hypothesized Results .....	82
Correlations Involving Self-Efficacy and Coping ...	90
Correlations Involving Maintenance Strategies	
and Exercise .....	91
Clinical Significance .....	93
Anecdotal Evidence for Treatment Effectiveness ....	96
Conclusion, Limitations, Recommendations .....	98
References .....	102

Appendix A .....	107
Demographic Profile .....	108
Informed Consent .....	110
Attribution Scale .....	111
Appendix B .....	112
Eating Self-Efficacy Scale (ESES) .....	113
Ways of Coping Checklist (WCCL) .....	115
Reliability and Validity for the WCCL .....	119
Appendix C .....	121
Expectancy Scale .....	122
Participant Evaluation .....	123
Appendix D .....	124
Multivariate and Univariate Analyses .....	125

## LIST OF TABLES

	page
Table 1. Means and Standard Deviations for Descriptive Data .....	61
Table 2. Means and Standard Deviations for Self-Efficacy for All Groups .....	64
Table 3. Means and Standard Deviations for Percentage of Problem-Focused Coping for All Groups .....	65
Table 4. Correlation Matrix for Dependent Measures and Subscales at Pretest, Posttest, and Follow-up for Combined+ Treatment Groups, MI-C and RPI-C .....	70
Table 5. Correlation Matrix for Dependent Measures and Other Variables at Pretest for all Participants .....	75
Table 6. Clinically Significant Change Within Combined Treatment Groups.....	78



## LIST OF FIGURES

page

Figure 1.	Representation of the Relapse Prevention Model (Marlatt and Gordon, 1980) as it Applies to Overeating .....	4
Figure 2.	Time-span of Study and Group Formation .....	48

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## INTRODUCTION

In a society that increasingly values a trim, youthful appearance, overweight people can be engaged in what seems like an endless battle of the bulge. Not everyone wants to lose weight for cosmetic reasons; health and longevity can also be an issue. Although commercial weight loss programs abound, all promising lasting benefits, most dieters eventually regain not only the weight they managed to lose but even more. The only recourse is another whirl on the diet merry-go-round, with a gradually fading hope of permanent success. Over time, failures to maintain weight losses can leave a person feeling inadequate and even stupid for not having properly "learned" the lessons of weight management. This study looked at some underlying factors associated with maintenance of weight loss and investigated the effects of an intervention program with a non-diet approach for women who had successfully lost weight but were concerned about long-term maintenance.

Obesity has been called "one of the most difficult medical and psychological problems of modern society" by a renowned researcher in the field (Brownell, 1982, p.820). Bray (1987) reviewed the medical findings and reported that body weights 20% above average are associated with increased death rates from heart disease, hypertension, diabetes mellitus, and cancer. Wadden and Stunkard (1985) looked at the social and psychological consequences of obesity and concluded that women, adolescent girls, and the morbidly

obese suffer severe consequences from a cultural contempt for the obese. Although a considerable amount of research has been done to develop effective treatment programs to help people lose weight, the goal of long-term maintenance remains discouragingly remote. Several decades ago, Stunkard and McLaren-Hume (1959) reported that two years after treatment for obesity, only 5% of 100 patients had maintained a weight loss of 20 pounds or more. With the introduction of behavioral interventions, weight loss treatments became more effective in terms of initial success, but Stunkard and Penick (1979) reviewed the results of several studies and concluded that the outlook for long-term maintenance had not improved.

Although the search for more effective weight-loss treatments goes on, some investigators have turned their attention to maintenance itself. Correlational studies have shown that exercise, monitoring of body weight and food amounts, self-attribution for success, and control of overeating in response to negative affect are important determinants of successful maintenance (Leon & Chamberlain, 1973; Stuart & Guire, 1978). Other research has identified long-term maintenance of any behavior change as a separate problem from the initial change and one that needs separate treatment (Marlatt & George, 1984; Marlatt & Gordon, 1980).

### Relapse Prevention

Working in the field of recovery from addictions to cigarettes, alcohol, and drugs, Marlatt and his associates identified factors involved in relapse and developed a relapse prevention model which is represented in Figure 1 (Marlatt & Gordon, 1980).

In the model, higher levels of self-efficacy and effective use of coping strategies are important factors in preventing relapse and they influence each other. In a high risk situation, an individual who uses a coping strategy that results in successful avoidance of a lapse will have increased self-efficacy in the future. On the other hand, if the coping strategy used is ineffective in reducing the risk of a lapse, the individual experiences a decrease in self-efficacy, is more likely to concentrate on the positive outcomes associated with the old behavior, and is likely to lapse into old behavior. Increases or decreases in self-efficacy will have an influence on what coping efforts are made in the next high-risk situation.

Lapses into old behavior result in the Abstinence Violation Effect (AVE), leading to negative feelings about one's ability to control the situation. The likelihood of a full-blown relapse is increased even more when the individual attributes the lapse to internal and stable deficits, such as lack of willpower, and feels helpless to regain control. This feeling of helplessness is related to

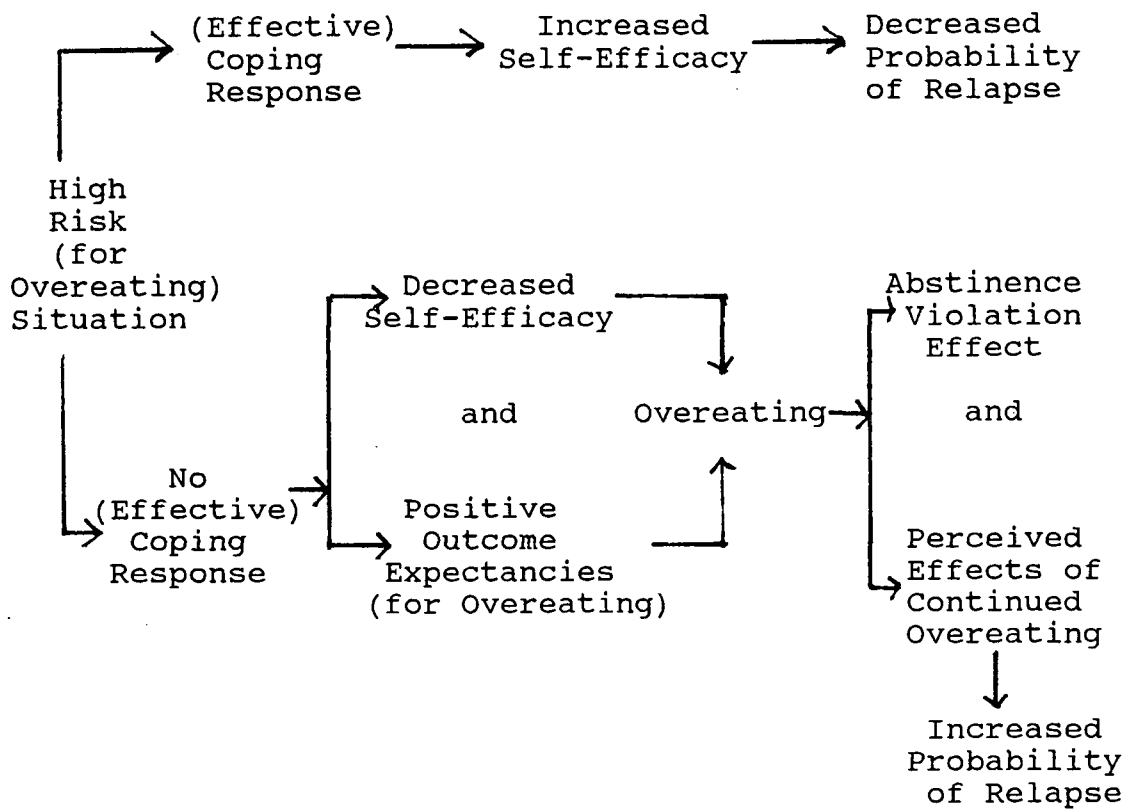


Figure 1. Representation of the Relapse Prevention Model (Marlatt & Gordon, 1980) as it Applies to Overeating.

decreased levels of self-efficacy for coping effectively with high-risk situations.

### Self-Efficacy in Relapse Prevention

The role of self-efficacy in relapse prevention is based on Bandura's (1977) theory that behavior change depends both on the individual's outcome expectancies that certain behaviors will result in desired outcomes, and self-efficacy expectations that he or she is capable of those behaviors. A person who has succeeded in losing weight has no trouble believing that controlled eating is associated with maintenance, but may have difficulty believing he or she is capable of exercising that control, particularly after a series of lapses.

Self-efficacy has been identified as an important factor in weight loss (Bernier & Avar, 1986; Weinberg, Hughes, Critelli, England, & Jackson, 1984). Bernier and Avar (1986) found that an increase in self-efficacy expectations during weight loss treatment was positively and significantly correlated with continued weight loss during two follow-up intervals. In Weinberg et al.'s study, groups with higher preexisting and manipulated levels of self-efficacy lost more weight than groups in which these levels were lower.

### Coping in Relapse Prevention

Adaptive coping has also received attention from investigators in this field. The use of behavioral and cognitive coping responses by dieters in high risk

situations was shown to be associated with positive outcomes in a recent study of relapse crises (Grilo, Shiffman, & Wing, 1989). Rippetoe and Rogers (1987) found that when self-efficacy and outcome expectancies were manipulated, higher levels strengthened the use of adaptive coping in individuals receiving information about breast cancer. Adaptive coping was identified as those efforts made by the individual to deal with the reality of the situation, such as performing regular breast self-examination or using rational problem-solving to deal with the health-threat issue.

A problem arises when coping strategies are identified as adaptive or effective. According to the Lazarus and Folkman (1984) model of stress, appraisal, and coping, it is important not to define coping efforts as good or bad per se when what is really being discussed is their longer-term outcome or consequences. The individual who overeats to reduce stress associated with negative feelings and then feels better, however momentarily, has in some respects coped successfully with the situation. However, if this individual is also trying to eat moderately in order to maintain a weight loss, overeating in response to negative affect is not an effective strategy since it is likely to lead to further negative feelings of guilt and failure. Thus describing coping efforts as adaptive or maladaptive in terms of their long-term effect seems warranted in this situation.



Identifying adaptive coping strategies for maintenance can be done by inference. The Grilo et al. (1989) study which investigated coping responses of dieters at high risk for lapse did not specify which strategies resulted in positive outcomes beyond labelling them as cognitive and behavioral. The Rippetoe and Rogers (1987) study was more specific, however, in defining as adaptive those strategies which were problem-focused and dealt with the reality of the situation. Correlational studies have identified factors associated with successful maintenance as those which involve dealing with the threat of relapse in a problem-focused manner, such as monitoring weight regularly, exercising, and reversing small gains quickly (Leon & Chamberlain, 1973; Stuart & Guire, 1978). It thus seems appropriate to make problem-focused coping efforts a focal point of interest in a maintenance study.

#### Relapse Prevention Training in Weight Loss Treatments

Another important focus for maintenance of weight loss research is the specific intervention strategies for relapse prevention that Marlatt and his associates developed through their work on relapse prevention (Marlatt & George, 1984). Broadly, these strategies involve skill training, cognitive reframing, and lifestyle intervention which can be incorporated into an individualized program for a person trying to maintain behavior changes.

Relapse prevention training has been used with some success in weight loss programs. A group of dieters who

were taught relapse prevention and other maintenance skills following a worksite weight loss program showed better maintenance of their losses at a 6-month follow-up than the group that did not receive this training (Abrams & Follick, 1983).

Sternberg (1985) found similar results with groups of dieters on a behavioral weight loss program. The group whose treatment included a relapse prevention component had significantly better weight losses at a 60-day follow-up than the comparison group. In another study which evaluated the long-term effectiveness of several modifications of a treatment program, only the group that had received a combination of behavior therapy, relapse prevention training, and posttreatment contact had maintained losses at a 10-month follow-up (Perri, Shapiro, Ludwig, Twentyman, & McAdoo, 1984).

In the above studies relapse prevention training took place during or immediately following weight loss. Whether or not it would be effective for once-successful maintainers in the process of relapse has yet to be demonstrated.

This study investigated the effects of a self-efficacy enhancement maintenance intervention program with and without a relapse prevention component on successful dieters at risk of relapse or already involved in the process. Changes in levels of self-efficacy and coping strategies used in response to negative affect associated with overeating were studied. The general hypotheses were that

levels of self-efficacy and the use of problem-focused coping would increase from pretest to posttest for both treatment groups, but not for a control group, and that this increase would be better maintained at a follow-up by the relapse prevention component group. In addition, a relationship between self-efficacy and coping strategies was expected to be demonstrated, with a greater use of problem-focused coping at posttreatment being associated with higher self-efficacy at follow-up.

## LITERATURE REVIEW

In a culture where appearance is of so much importance for social and even career success, the overweight person is often involved in what seems like an endless struggle to lose weight. Although some people diet to lose 10 to 15 pounds merely for cosmetic reasons, others have serious health concerns related to obesity or find that being overweight is keeping them from living full lives. Commercial weight loss programs offer help to those who find it difficult to diet on their own, promising to teach them all the skills necessary to maintain the loss. Unfortunately, no matter how successful a dieter is in losing weight, the long-term outcome is poor, with most people regaining the weight they lost and even more. The only recourse for the unsuccessful maintainer is another diet, with the sad prospect of another eventual failure.

While research continues to investigate the causes and most effective treatments for obesity, the issue of why so many weight loss treatment successes become maintenance failures deserves equal attention. This review focuses on some of the underlying factors involved in weight loss maintenance and the effects of a non-diet intervention program for women concerned about their ability to maintain previously achieved weight losses.

Obesity has been called a serious, prevalent, and refractory disorder by one of the leading researchers in the field (Brownell, 1982, p.820). Considerable research has

been done on the causes of obesity with a very recent focus on the role of heredity in a predisposition to be overweight. Stunkard, Harris, Pedersen, and McClearn (1990) reviewed data on 247 identical and 426 fraternal pairs of twins, reared together or apart, and found that the genetic influences on body-mass index were substantial, accounting for as much as 70% of the variance.

In another study, when 12 pairs of young adult male monozygotic twins were systematically overfed by 1000 kcal per day for 84 days during a 100 day period, the within-pair similarity of weight gain and fat increase in response to overfeeding was significant ( $p < .05$ ) (Bouchard et al., 1990). The researchers concluded that genetic factors may govern the tendency to store energy as either lean or fat tissue, thereby disposing some individuals to gain weight more easily than others.

Although this recent research argues for a strong genetic component in the development of obesity, the search for a solution to the problem goes on. There are serious health risks associated with obesity. Bray (1987) reviewed a series of studies that have associated being overweight (body mass index of 25-30 kg/m<sup>2</sup>) or obese (BMI of 30 kg/m<sup>2</sup>) with an increased mortality rate, cardiovascular disease, hypertension, impaired pulmonary function, diabetes, gallbladder disease, and some types of cancer.

Additionally, there are social and psychological consequences of obesity. Wadden and Stunkard (1985)

reviewed a series of studies which found strong prejudice against the obese among children as young as 6, adults of every socioeconomic category, and health care practitioners. The obese were seen as lazy, weak-willed, unattractive, and self-indulgent and the tendency to view obesity as a moral failing contributed to job and social discrimination. The authors concluded that women, adolescent girls, and the morbidly obese are the common victims of this cultural contempt for the overweight.

Thus, developing a treatment that results in permanent weight loss has been an ongoing concern for researchers in this field. Yet permanent weight loss remains an elusive goal. Some years ago, Stunkard and McLaren-Hume (1959) reported that two years after treatment for obesity, only 5% of 100 patients had maintained a weight loss of 20 lbs or more. With the development of behavior therapy treatment programs, weight loss during treatment improved, but when Stunkard and Penick (1979) reviewed the results of such programs, they concluded that the outlook for long-term maintenance had not improved. In their own study, at a 1-year follow-up after either a behavioral or a standard medical treatment for obesity, 17 of the 28 patients weighed less than they had at the end of treatment. At a 5-year follow-up, however, only 7 patients still weighed less than at posttreatment, 3 of whom had been in the behavior therapy group.

### Correlates of Successful Maintenance

Although the search for more lastingly effective weight loss treatments continues, some researchers have begun to turn their attention to maintenance itself. One approach has been to identify cognitions and behaviors that are associated with successful maintenance. Increased exercise, for example, was identified as an important factor by 41 women and 13 men who had lost at least 20% of their body weight and maintained that loss for at least two years (Colvin & Olson, 1983).

In another correlational study, data were collected from 721 women 15 months after they had reached their target goal weights following a commercial weight loss program (Stuart & Guire, 1978). This study found that those who remained physically inactive or reverted to this state after weight loss were an average of 13.7 lbs above goal, while those who had higher levels of activity were an average of only 5.1 lbs above goal.

In addition to exercise, regular monitoring of weight, feeling personally responsible for successful weight loss, and feeling in control of overeating in response to negative affect were among several factors related to successful maintenance in correlational studies (Colvin & Olson, 1983; Leon & Chamberlain, 1973; Stuart & Guire, 1978).

Investigating the role of continued use of specific behavioral strategies in weight loss maintenance, Stalonas, Perri, and Kerzner (1984) looked at the long-term

effectiveness of their 10-week behavioral treatment program for obesity for 44 predominantly female participants. The average weight loss at posttreatment was 10.7 lbs, and at the 3-month follow-up, 12.5 lbs. However, when the researchers were able to contact 36 of the 44 participants five years later, 86% of them had gained weight, with the average regain being 16.3 lbs. They also found that the number of behavioral techniques participants used and the months of conscientious use of these techniques were each significantly and negatively correlated with posttreatment weight gains ( $r = -.54$ ,  $p < .01$ , and  $r = -.48$ ,  $p < .05$ , respectively).

The foregoing study supports the idea that continued use of strategies associated with weight loss are important, yet the majority of successful dieters appear to abandon them posttreatment, something that puzzles researchers. Stunkard and Penick (1979) argue that the individual who is trying to maintain a weight loss faces a unique and unusually difficult challenge. Unlike someone who has recovered from an addiction to alcohol or tobacco, the successful dieter must continue to use, in careful moderation, the substance which proved so difficult to control in the past. Added to that is the fact that a genetic predisposition to be overweight may make control of caloric intake extremely important for successful weight loss maintenance. A third complication is that there is some evidence from the literature on restraint that dieting,



or carefully controlling caloric intake, makes an individual vulnerable to overeating once the control is relaxed (Polivy & Herman, 1985).

#### Understanding the Relapse Process

Although the challenge of moderate use is different from that of abstinence, work done by researchers in the field of recovery from addictions offers some explanation for what happens during relapse and suggests a new direction for intervention (Marlatt & George, 1984; Marlatt & Gordon, 1980). Viewing relapse as a process with discrete sequential steps, rather than as one abstinence-nonabstinence event, Marlatt and his associates devised a cognitive behavioral model for relapse prevention (see Figure 1).

In the model, levels of self-efficacy and the use of coping strategies are identified as two important factors in the relapse process. A high-risk situation is one in which the individual is tempted to use (or overuse, in the case of food) the substance to be avoided. When no coping response that results in mastery of the situation is made, self-efficacy decreases and the remembered pleasurable outcome of using the substance becomes salient, leading to a lapse, or slip back into old behavior. The individual's cognitive and affective responses to this lapse are called the Abstinence Violation Effect (AVE) in the model. The AVE has two components: (a) cognitive dissonance, and (b) personal attribution.

The cognitive dissonance component is based on Festinger's (1964) theory that cognitive dissonance develops when there is a disparity between the individual's view of himself (e.g., as a moderate eater) and behavior that is incongruent with that view (e.g., overeating). This internal conflict motivates the individual to reduce this dissonance either by doing something to cope with the dissonant feelings of guilt, tension, and anxiety (e.g., continuing to eat, if that has been a coping response to deal with stress in the past), or by changing his or her self-image to one more congruent with the behavior (e.g., seeing oneself as someone who cannot control overeating).

The self-attribution component of the AVE can thus lead the individual to see the lapse as the result of personal weakness or failure rather than as a response to the external situation (e.g., "I have no willpower," instead of, "I wasn't prepared to handle that situation well."). This would lead to decreased self-efficacy in subsequent high-risk situations because there would be an generalized expectation of failure.

Another element in this relapse process is that the old behavior, such as overeating, has probably been used in the past as a means of dealing with negative feelings, and thus further overeating seems attractive as a way of coping with the negative feelings associated with the AVE. As one lapse follows another, the likelihood of full-blown relapse is increased.

The relapse prevention model shows what an individual does in a high-risk situation has important consequences for relapse. Every temptation to overeat is not a high-risk situation, however. What matters is how strong the temptation is and whether the individual feels capable of resisting the temptation, or even wants to. Marlatt and his associates have identified factors that can lead up to high-risk situations, pointing out how lifestyle imbalances can lead to a desire for indulgence and contribute to the likelihood of a lapse.

#### The Roles of Self-Efficacy and Coping in Relapse Prevention

Self-efficacy in the relapse prevention (RP) model is based on Bandura's (1977) theory that successful behavior change depends not just on an individual's belief that certain behaviors will produce the desired outcome (outcome expectancies), but that he or she will be capable of executing those behaviors (self-efficacy expectancies). It is these self-efficacy expectancies that are damaged when lapses occur.

The role of coping and its effect on self-efficacy and successful outcomes in high risk situations is clearly defined in the RP model, yet the suggestion that no coping efforts are made when lapses occur is imprecise. According to the Lazarus and Folkman (1984, p.141) definition in their model of stress, appraisal, and coping, coping refers to "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are

appraised as taxing or exceeding the resources of the person." Thus, whatever an individual thinks or does in a high risk situation is coping of some nature, whether or not a lapse occurs as a consequence. Choosing to eat, for example, is a coping strategy that has been identified by Lazarus and Folkman (1984) in their Ways of Coping Checklist and by Latack (1986) as a symptom management strategy for job-related stress.

Lazarus and Folkman suggest that too often coping efforts are confounded with coping outcomes, so that a person is said to have coped with a situation only if the longer-term outcome is successful. The developers of the RP model are clearly discussing coping in terms of outcome when they describe coping efforts as "adaptive" if they result in mastery of the source of potential danger (Cummings, Gordon, & Marlatt, 1980, p. 297). There is a potential risk associated with this in that the coping strategies that result in positive outcomes may be seen as good or bad in themselves.

Although it may not be appropriate to categorize specific coping strategies this way, identifying those which are adaptive or maladaptive in terms of outcome may be important in relapse prevention. For example, if someone who is concerned about gaining weight eats a big bowl of ice-cream when feeling sad or lonely, the outcome might be adaptive in terms of improving mood temporarily, but maladaptive over the longer-term with respect to weight

control. Realizing that the extra calories are likely to show up as a weight gain in the future, the individual might feel increased stress. In a longitudinal study of stress, researchers found that major life events did not account for as much of the variance in psychological symptoms as did the minor ones, or daily hassles (Kanner, Coyne, Schaefer, & Lazarus, 1981). Concern about weight was the hassle most frequently reported by their 100 subjects (52 women, 48 men, aged 45-64 years).

To appreciate the importance of self-efficacy and coping strategies in maintenance and relapse prevention, it will be helpful to look at weight loss research on these factors.

#### Self-Efficacy in Weight Loss and Maintenance.

The role of self-efficacy in weight loss success has received considerable attention (Bernier & Avard, 1986; Edell, Edington, Herd, O'Brien, & Witkin, 1987; Mitchell & Stuart, 1984; Weinberg et al., 1984). In a study involving 62 overweight women who volunteered for a 10-week behaviorally oriented weight reduction program, Bernier and Avard found a significant relationship between weight change and self-efficacy during the 6 week and 6-month follow-up intervals. Posttreatment weight loss was not found to be related to later outcome, however. The authors felt that there were difficulties involved in measuring self-efficacy levels for future behaviors. When they assessed an individual's confidence that she would be able to perform

the cognitive-behavioral strategies in their treatment package, or to avoid eating in high-risk situations, there was no immediate demand for that behavior, so Bernier and Avard wondered if they might have simply measured a general sense of self-efficacy.

Edell et al. (1987) conducted a retrospective study of 52 men and 95 women to determine whether self-efficacy and self-motivation measured before and during treatment predicted outcome in a weight loss program. They found that self-efficacy measures correlated significantly with weight losses and suggested that this was a useful predictor of weight loss success. The measure of self-efficacy used was vaguely described as confidence intervals and outcome expectancies, so it may be general self-efficacy that was involved.

Mitchell and Stuart (1984) looked for a link between weight-control self-efficacy and the dropout rate for 414 participants in a large-scale behavioral program. They found that dropouts were significantly more likely than those who continued participation to report low self-efficacy at the beginning of their membership. Interestingly, they also found that dropouts were significantly less likely to feel successful in weight control and behavior change, even though their rates of weight loss did not differ significantly from those who continued to be members.

Weinberg et al. (1984) investigated the effects of preexisting and manipulated self-efficacy on weight loss on 28 women and 4 men volunteers for a self-control program. Preexisting self-efficacy was measured as the level of confidence participants expressed in their ability to lose the weight they predicted was possible for them on the 2-month program. Self-efficacy was manipulated in 2 of the 4 treatment groups by informing participants that their initial screening psychological tests had indicated they would do well in a self-control weight loss program and reinforcing this idea at every session. Significant interactions were found. Participants with high preexisting self-efficacy lost more weight over time ( $\bar{M} = 8$  lbs) than those with low levels at pretest ( $\bar{M} = 3$  lbs). Participants in the 2 manipulated self-efficacy groups lost more weight over time ( $\bar{M} = 7$  lbs) than those in the non-manipulated condition ( $\bar{M} = 2$  lbs).

The number of participants with high or low preexisting self-efficacy and the number in each treatment group were not stated in the Weinberg et al. study. The small sample size ( $N = 32$ ) and number of groups limited group size, and so results from this study have limited generalizability.

What is clear from these studies, however, is that self-efficacy plays an important role in successful weight loss. One puzzling finding in a few of these studies is that weight loss does not necessarily result in higher levels of self-efficacy. From Bandura's (1977) theory of

self-efficacy, experiences of mastery should result in enhanced self-efficacy. Why this does not necessarily occur with weight loss may be related to the individual's appraisal of his or her achievement. Bandura suggests that when success has been achieved with minimal effort, the individual is likely to ascribe that success to ability, and this fosters a strong sense of self-efficacy. By contrast, someone who has worked hard for success is less likely to feel it was the result of ability, and thus self-efficacy is not strengthened.

This may be an important point when investigating maintenance difficulties. Persisting in behaviors like careful charting of food amounts and calories, weighing and measuring foods, and resisting temptations to overeat, may seem like hard work even if it results in weight loss maintenance. Over time self-efficacy may be subtly undermined, with the person feeling like someone who has to exercise rigid control or face the consequences of weight gain rather than someone who is generally in control of overeating.

In terms of weight loss maintenance, self-efficacy can be a general belief in one's ability to stay at a target weight, or a more specific confidence in doing what is necessary to achieve that. Maintaining a weight loss involves a series of behaviors, from controlling the amount of calories taken in to expending enough energy to offset imbalances. Since weight gain occurs when more calories are



ingested than the body needs for energy, high levels of self-efficacy to control overeating seem essential for the successful maintainer.

Overeating can be simply defined as ingesting more calories than are required by a particular individual to maintain a target weight. The point at which eating becomes overeating may not always be clear. An extra 120 kcal a day, a piece of bread and a small apple, for example, may not look like overeating but adds up to 3600 kcal in a month, equivalent to a gain of 1 lb. Over a year, this could mean a 10-12 lb gain.

Because control rather than abstinence is involved, successful maintenance of weight loss involves ongoing decisions about what kind of food to eat, what amount, and how often. Like almost everyone else, the successful dieter will occasionally overeat, either thoughtlessly or by deliberate choice. Unless there are strong AVE responses, the first few lapses may have little effect on self-efficacy, especially if the person gets right back on track. As time passes and the number of lapses accumulates, weight gains may occur. At this point, the AVE is likely to be much stronger and lead to even more overeating. Self-efficacy is therefore more likely to be affected by continuing difficulties in controlling overeating, rather than by isolated episodes.

### Coping in Weight Loss and Maintenance

Coping strategies important for weight loss have been studied by Grilo et al. (1989). These researchers analyzed posttreatment interviews with 57 obese dieters (24 men and 33 women) for relapse crisis situations in which dieters had either lapsed or had overcome the temptation to overeat. They found that coping was the strongest correlate of outcome with the use of either cognitive or behavioral coping responses being associated with positive outcomes. Unfortunately, these researchers did not specifically identify the coping strategies involved. Interestingly, using more than one behavioral coping response or more than one cognitive response was not associated with more positive outcomes in resisting temptation, while using a combination of the two types was.

Consistent with the relapse prevention model (Marlatt & George, 1984), Grilo and his associates found that dieters who reported using no coping strategies in relapse crisis situations inevitably experienced a lapse. Here coping is clearly being confounded with its outcome. It might be more appropriate to say that no coping strategies directed at avoiding overeating were used. The individual who is tempted to eat in a high risk situation may use emotion-focused coping efforts to rationalize or feel better about doing something that is not consistent with staying at a target weight.

The work done in developing behavior therapy for weight loss (e.g., Stuart, 1978) clearly identified the importance of using a variety of coping strategies in high risk situations, such as being assertive in response to social pressures to eat, finding alternatives to inappropriate eating, and decreasing the impact of food cues, in achieving weight loss. The possibility exists that the coping strategies necessary for weight loss are different from those necessary for maintenance. When Stuart and Guire (1978) surveyed 721 women who had been successful in reaching their goal weights on a behavior modification weight loss program, they found that those women who were maintaining losses at 15 months posttreatment had several things in common. They had confidence in their ability to maintain, reversed small gains quickly, were still associated with the weight loss program, and continued to use strategies such as exercise, using stimulus-control techniques to avoid snacking, and managing moods effectively.

Colvin and Olson's (1983) research involved extensive interviews with 41 women and 13 men who had lost at least 20% of their body weight and maintained that loss for at least 2 years. In contrast to Stuart and Guire's findings, the successful maintainers in their study were no longer associated with commercial or medical weight loss programs, although 14 of the 41 women had used them to lose weight, nor did any of these women follow a formal diet plan as

maintainers. Instead of identifying specific strategies they used for managing eating, the women in Colvin and Olson's study reported that a better understanding of nutrition, increased exercise, and monitoring their weight were important for their maintenance success. These same factors were identified in Jeffrey et al.'s (1984) study of weight loss and maintenance in a group of 89 middle-aged men. Colvin and Olson felt that what was most important for their successful maintainers was that the women had taken responsibility for their own weight management and had developed individual eating and exercise habits that allowed them to maintain their losses.

In a 5-year follow-up study of a behavioral treatment program for obesity, Stalonas et al. (1984) found that only 2 of the 13 behavioral strategies taught during treatment were significantly related to the maintenance of weight loss. The strategies identified were charting weight daily and making eating a "pure" experience (not engaging in other activities such as reading or watching television during meals). Of interest is the fact that exercise was not one of the factors associated with successful maintenance in the Stalonas et al. study.

In most of these studies, regular weight monitoring and exercise are correlated with successful maintenance, but beyond this, few specific strategies for coping with temptations to overeat are identified. In other words, the macroskills necessary for maintenance are emerging in these

studies, but the microskills necessary for eating management may vary from person to person.

Instead of looking at one or two specific behavioral techniques, it might be more fruitful to see if certain types of coping strategies are associated with successful weight loss maintenance. Although the issues are different, research done on the effect of self-efficacy on adaptive and maladaptive coping efforts in response to a health threat may provide some clues. Rippetoe and Rogers (1987) investigated the intended coping responses of 167 female undergraduate psychology students who were given information about breast cancer and whose levels of self-efficacy and outcome expectancies for breast self-examination were experimentally manipulated. A significant interaction was found between self-efficacy and coping and outcome expectancies and coping. Higher levels of self-efficacy and outcome expectancies were associated with stronger intentions to perform breast self-examination and a stronger belief in a rational problem-solving approach to the threat of breast cancer. These coping efforts were judged to be adaptive because the individual was dealing with the reality of the situation, the health threat, and not attempting to deny or avoid it. Thus, they can also be called problem-focused.

The threat of regaining lost weight is a real one for individuals who are trying to maintain. In a study of the coping responses of 85 married couples, researchers found

that different types of coping were used depending on what was at stake and what the coping options were (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). When a situation was appraised as changeable, more confrontive coping, accepting responsibility, planful problem-solving, and positive reappraisal were used. On the other hand, when the situation was appraised as one that had to be accepted, participants used more distancing and escape-avoidance coping.

Clearly the most adaptive coping strategies for people trying to maintain a weight loss are those focused on dealing with the problem, not trying to avoid it. Someone trying to control overeating can not afford to engage in the rationalizations or denial of feelings which Marlatt (1985) identifies as two of the cognitive pitfalls that contribute to relapse. From the Folkman et al. (1986) study, it appears that the individual who perceives the situation as changeable will use more problem-focused coping. This suggests that the person who attributes the cause of overeating to something that can be changed will be more likely to use coping responses that are problem-focused and therefore adaptive in avoiding relapse. Age may also influence the use of problem-focused coping. In a study that investigated relative use of different types of coping in response to daily hassles among 85 younger married couples and 161 older people, older participants were found to use relatively less problem-focused coping than younger

participants, suggesting that problem-focused coping decreases with age (Folkman, Lazarus, Pimley, & Novacek, 1987).

The relapse prevention model (Marlatt & Gordon, 1980) focuses on an individual's coping response to a high risk situation, but whatever that person thinks or does after a lapse may be equally important. The model predicts that the individual who has lapsed into old behavior will experience an Abstinence Violation Effect (AVE). This results in negative affect and continuing to use the old behavior may be seen as an attractive means of dealing with the stress associated with that affect. The consequences of this are a greater likelihood of full relapse. The individual who uses other coping strategies that are more adaptive in terms of outcome will be therefore be more successful in avoiding relapse.

#### Relapse Prevention Training in Weight Loss and Maintenance

Based on their work on relapse prevention, Marlatt and his associates (Marlatt & George, 1984) developed an intervention program to teach specific strategies to individuals trying to maintain significant behavior changes. Through a therapeutic process in which the individual works as a colleague with the therapist, a lifestyle assessment is done and coping skills and cognitive reframing are developed which become integral parts of an individual's relapse prevention plan.

Most of the studies done on relapse prevention training have been in the areas of recovery from addictions to alcohol, tobacco, and illegal drugs, but its application to weight loss maintenance has been noted. Abrams and Follick (1983) found that 133 predominantly female subjects, aged 20 to 60 years, who had been taught relapse prevention along with other maintenance skills following a worksite weight loss program, maintained their losses significantly better at a 6-month follow up than those who had been assigned to a maintenance condition in which no new skills were taught. Since relapse prevention was only one of several maintenance strategies that were taught to the more successful group, however, it is impossible to determine whether it was an individual strategy or the combination of them that mattered. Additionally, the high attrition rate reported in this study, with only 24 of the original 133 participants measured at the 6-month follow-up, makes it difficult to generalize the findings of this study, since those who dropped out may have been people who were less successful in maintaining their weight losses.

In another investigation of relapse prevention in weight loss maintenance for 43 predominantly female dieters, Sternberg (1985) reported that the group that had been taught the principles of the relapse prevention model during a 9-week behavior therapy weight-reduction program showed significantly better weight loss at the 60-day follow-up



than the group who had undergone identical treatment without the relapse prevention component. Although the groups did not differ in weight change from pretreatment to posttreatment, when 36 participants were contacted for the 60-day follow-up, the relapse prevention group ( $n = 22$ ) had continued to lose weight, while the standard treatment group ( $n = 14$ ) was beginning to regain. A significant difference was found in the total amount of weight lost (RP group,  $M = -13.9$  lbs; standard treatment group,  $M = -8.7$  lbs;  $t(34) = 2.08$ ,  $p < .05$ ).

Additionally, although 80% of the relapse prevention group in the above study reported experiencing lapses during the 60-day follow-up period (as compared to 100% of the standard treatment group), they were more likely to see their decision to overeat as a deliberate one. The researchers suggested that the relapse prevention component had been effective in reducing the number of lapses an individual experienced and also in changing some of his or her perceptions of those events.

In another study of 129 predominantly female participants in a 15-week behavioral or nonbehavioral weight loss treatment program, the benefits from relapse prevention training were less clear (Perri et al., 1984). When the weight loss maintenance success of 93 remaining participants was measured at a 12-month follow-up, only the group ( $n = 17$ ) that had received behavioral treatment, relapse prevention training, and gradually fading posttreatment

therapist contact by mail and telephone had maintained their losses. On the other hand, Perri et al. also found that the group ( $n = 15$ ) that had received behavioral treatment and relapse prevention training but no posttreatment contact were the least successful of the 4 treatment groups in maintaining a loss of 20 lbs or more at the 12-month follow-up.

In attempting to explain this finding, the researchers wondered if without further therapist contact the 6 sessions of relapse prevention training during treatment had been sufficient to teach the cognitive and behavioral strategies involved. A further concern they had was that without therapist feedback, individuals might have misused some of the cognitive coping procedures to rationalize lapses without implementing the behavioral techniques important for getting back on track. Perri et al. concluded that the guidance of a therapist may be essential in helping clients use the relapse prevention strategies effectively.

#### Development of a Maintenance Treatment Program

The preceding studies on the roles of self-efficacy and coping strategies in weight loss and maintenance and the effectiveness of relapse prevention training indicate that these are productive areas for further research. One direction suggested by Stalonas et al. (1984) is to assess the effects of maintenance treatment programs that take individual differences and needs into consideration, rather than delivering prepared treatment components at fixed

intervals. From the weight-loss studies reviewed, it appears that as such programs are developed, it will be important that they focus on increasing self-efficacy, encouraging problem-focused coping, and teaching the principles of relapse prevention.

The first issue is how such a program could increase self-efficacy. A program with a focus on weight loss, one that encouraged the use of specific behavioral strategies like charting calories consumed, using stimulus control to avoid overeating, and increasing physical activity, might well result in weight losses for those who used the strategies. Weight loss during treatment is not necessarily associated with changes in self-efficacy, however. Mitchell and Stuart (1984) found that participants in a commercial weight loss program who dropped out of treatment were less likely to have high levels of self-efficacy for weight control and behavior change than those who continued in treatment, even though the rates of weight loss for the two groups did not differ. The researchers concluded that perception of success was more important than actual success in feelings of self-efficacy and hypothesized that those with lower levels of self-efficacy even after weight loss might have strong convictions that they cannot succeed. Perhaps this is related to Bandura's (1977) idea that successful performance does not necessarily lead to increased self-efficacy, especially when the individual

attributes a positive outcome to hard work rather than ability.

The effect of failure to maintain weight loss on self-efficacy in future weight management efforts must also be considered. In an investigation of factors associated with weight loss and maintenance in 89 middle-aged men, researchers found that men with prior diet failures had exceptionally poor long-term maintenance success at the 2-year follow-up (Jeffrey et al., 1984). Although encouraging unsuccessful maintainers to undertake another diet is an attractive focus for a maintenance intervention, this approach ignores the fact that people who have regained weight are likely to feel a personal sense of failure. Before they try to lose weight again, they need to feel strongly convinced that they will be able to maintain their loss this time. Bandura (1982) describes the situation in which people see themselves as ineffectual in achieving outcomes which are perceived to be achievable by others as one which leads to self-disparagement and depression.

Stalonas et al. (1984) briefly reviewed the findings of their own and other studies on the importance of the continued use of behavioral strategies like monitoring of weight, making eating a "pure experience", etc., in long-term weight loss maintenance and concluded that when these strategies are conscientiously used, successful weight management is likely. What discourages researchers is that successful dieters do not continue to use these techniques.

This is the issue an intervention program should address: why do people stop doing what works so effectively? One possibility is that their levels of self-efficacy have decreased. One factor in this decrease is that during successful maintenance, unlike during weight loss, no real progress is made towards a goal; the goal is to stay where one is. Bandura (1977) suggests that people who are successful but feel that their performance has levelled off compared to an earlier rate of achievement have lower levels of perceived efficacy than those who have setbacks but see they are making some progress. The task for a maintenance intervention thus becomes one of instilling or rebuilding a strong belief in personal self-efficacy.

As Stunkard and Penick (1979) have pointed out, the successful dieter faces a lifetime of controlled use of the very substance that caused the problem while being constantly tempted to overeat by the easy availability of high-calorie, good-tasting foods. Food is not only nourishment, but also plays an important role in gatherings, celebrations, and special events where there can be strong social pressure to indulge in extra calories. The point at which eating becomes overeating can become increasingly difficult to determine over time as the successful dieter begins to relax dietary restrictions. Initial episodes of overeating may result in the AVE of the relapse prevention model (Marlatt & Gordon, 1980) and a quick return to controlled eating, but as lapses accumulate for all but the

most disciplined maintainer, gradually they may erode an individual's confidence that he or she can control overeating.

What might increase this sense of confidence, or self-efficacy, is a treatment intervention that helps an individual recall the period of successful weight loss maintenance. By remembering what behaviors, activity levels, and coping strategies were used at that time, the individual becomes aware that he or she was in fact capable of successfully maintaining a weight loss for however limited a time and specifically identifies what was necessary for that success. Bandura (1977) has identified four major sources of information for efficacy expectations: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. An intervention program with a support group format could provide people with three of these four sources of information. They could recall and discuss their successful past accomplishments of weight loss maintenance as well as their current successes in reversing the gradual deterioration of their weight management skills (performance accomplishments), hear the success stories of others (vicarious experience), and receive encouragement, advice, and support from their peers in their current weight management efforts (verbal persuasion).

The second focus for a maintenance intervention treatment program would be identifying types of coping

responses associated with successful maintenance. One way this could be done is to provide participants with information about the behaviors that have found to be associated with maintenance in correlational research. These include regular weight monitoring, exercise, and continued use of the specific strategies the individual found helpful in weight loss (Stalonas et al., 1984; Stuart & Guire, 1978).

Another factor related to successful weight loss maintenance was an individual's ability to control overeating in response to negative affect (Leon & Chamberlain, 1973). In a study of 66 predominantly female successful dieters and 39 control group (non-dieter) participants, the control group showed a strong association between eating and hunger, while the groups of regainers (a regain of more than 20% of their weight losses) and maintainers (a regain of less than 20%) showed an association between eating and emotional arousal. Thus, helping struggling maintainers to develop coping strategies other than eating for dealing with negative affect may be an important focus for an intervention program.

The third focus for such a program is relapse prevention training. Marlatt and George (1984) recommend an individualized program of techniques which addresses the particular high risk situations, lifestyle, and coping skills of each person. This approach is not suitable for a support group format because it involves time-consuming,

Careful work between a therapist and individual in developing a personal relapse prevention plan. As an alternative, providing program participants with information about relapse prevention and how to develop a plan might foster a sense of self-responsibility. One factor that Colvin and Olson (1983) identified as characterizing successful weight loss maintainers was a strong sense of personal responsibility for weight management. Putting the onus on the intervention program participants to develop their own plan might thus contribute to future success.

#### Assessing the Effectiveness of a Maintenance Intervention Program

The effectiveness of a program designed to increase self-efficacy and the use of problem-focused coping can be assessed by measuring changes in these factors over time. Self-efficacy could be measured as an individual's general belief he or she can maintain a weight loss, but that might not be as informative as measuring confidence in ability to perform specific behaviors. A person might express confidence in achieving a desired outcome that has more to do with wishful thinking than realistic expectations. When Stalonas et al. (1984) interviewed the 28 remaining participants (original  $n = 44$ ) in the 5-year follow-up of a behavioral treatment for obesity, they found that the average participant had gained 11.94 lbs since treatment termination and was 1.49 lbs heavier than at pretreatment. Despite this, 87% of these people expected to lose weight or



maintain their losses over the next 5 years, and the average expected loss was 13 lbs.

A better method of measuring self-efficacy would be to identify an important behavior in weight management and measure an individual's confidence in performing that behavior. Since successful weight management depends on establishing an energy balance in which the calories consumed are equal to the energy expended, confidence in one's ability to control caloric intake appears to be a good focus for measuring self-efficacy. Researchers have developed an Eating Self-Efficacy Scale that measures an individual's level of confidence that he or she can control overeating in a variety of situations (Glynn & Ruderman, 1984). This scale can thus be used to measure changes in self-efficacy that may occur as a result of treatment.

Some support exists for the idea that levels of self-efficacy affect coping strategies. Rippetoe and Rogers (1987) found that higher levels of either self-efficacy or outcome expectancies, existing at pretest or manipulated during treatment, were associated with greater use of adaptive coping in a study of coping response to a health threat (breast cancer). Adaptive coping was defined as using strategies that were problem-focused and dealt with the reality of the situation, such as performing breast self-examination.

In another study, increased levels of general self-efficacy were not found to be associated with changes in

their coping strategies, as measured on the two domains of types of coping strategies (Long & Haney, 1988). This study compared the effects of two stress-reduction interventions on 61 sedentary working women. Participants in both programs significantly increased general self-efficacy, but active and passive coping did not significantly change from pretest to posttest.

The Rippetoe and Rogers (1987) study identified one particular stressor, the threat of getting breast cancer. Self-efficacy was manipulated in terms of how well an individual could deal successfully with that particular stressor and coping was assessed in terms of response to that stressor. Reporting on the results of several comparative studies by other authors, Bandura (1986) states that particularized measures of self-efficacy surpass globalized measures in terms of explaining and predicting behavior. Thus, the results of the Long and Haney (1988) study could be due to the fact that general measures of work-related stress were used, rather than a specific one.

In order to examine changes in coping over time which may result from changes in self-efficacy levels, it might be helpful to identify a particular type of stressor, rather than look at coping responses to a variety of stressors. In a recent study on consistency in coping, moderate consistency in response to the same stressor over time was found, but only low consistency when two stressors were identified (Compas, Forsythe, & Wagner, 1988).

One particular stressor that can lead to overeating has been identified in the relapse prevention model as the negative affect resulting from the AVE (Marlatt & Gordon, 1984). Negative affect has been associated with eating (Leon & Chamberlain, 1973), and with relapse crises and coping among dieters (Grilo et al., 1989). As has been earlier noted, problem-focused coping that deals with the reality of the situation (e.g., acknowledging that overeating has occurred but keeping the situation in perspective) is less likely to lead to further overeating than emotion-focused coping such as wishful thinking or avoidance (e.g., wishing the overeating hadn't occurred or trying not to think about it). Coping with negative affect in a problem-focused way can thus keep self-efficacy levels from decreasing further.

#### Purpose of the Study

A review of the work done on developing effective treatment programs for obesity leads to the conclusion that programs have become increasingly sophisticated without altering the fact that something goes very wrong in long-term weight loss maintenance. Researchers add more and more components to treatment programs in the hope of finding the missing element that makes successful treatment permanent. Dieters who faithfully abide by treatment guidelines and lose weight, then fail to maintain their losses, are likely to blame themselves and lose confidence in their ability to succeed. Clearly it is time to approach the problem from

another direction and see if anything can be done to interrupt the process of relapse once it has begun.

The expected effect of a maintenance intervention program with a focus on increasing self-efficacy and exploring issues related to weight management would be that participants' levels of self-efficacy and relative use of problem-focused coping will increase as they begin to shift from self-blame to self-understanding in response to overeating episodes. Those participants who also receive information on the relapse prevention model would be expected to develop a fuller understanding of the situational nature of lapses and thus be more likely to persevere in taking a problem-focused approach to negative affect resulting from overeating.

### Hypotheses

1. Self-efficacy in eating situations, measured by scores on the Eating Self-efficacy Scale (ESES), increases significantly more from pretest to posttest for both the RPI group and the MI group as compared with the waiting list (WL) group.

2. Self-efficacy, as measured above, is maintained at posttest levels for the RPI group from posttest to the 6-week follow-up, and is significantly greater than levels for the MI group, which decrease from posttest to follow-up.

3. The relative score for Problem-focused coping to the overall coping score on the Vitaliano et al. (1985) revision of the Ways of Coping Checklist (WCCL) increases significantly more from pretest to posttest for both the RPI group and the MI group as compared with the WL group.

4. The relative score for Problem-focused coping strategies to the overall coping score is maintained by the RPI group from posttest to 6-week follow-up, and is significantly greater than that of the MI group which decreases.

5. There is a moderately significant negative association between the relative score for Problem-focused coping strategies at posttest and self-efficacy scores at the 6-week follow-up for both the RPI and MI groups (i.e., greater relative use of Problem-focused coping is associated with greater self-efficacy).

## METHOD

### Subjects

The original sample consisted of 72 women who met screening criteria, however, a total of 59 women were retained for analysis. Individuals responded to articles in local newspapers and a short radio interview which briefly described a research program for women who had successfully lost weight but were having difficulty maintaining that loss. Altogether 152 women and 7 men contacted the experimenter, but only 72 of them qualified for the program.

The 7 men were thanked for their interest and told that the program was limited to women. Women who qualified for the study were those who answered "yes" to the following questions: (a) "Have you successfully lost weight to a target or goal weight at some time in the past?" (b) "Were you able to maintain that loss within 5 lbs for at least 6 months?" and "no" to the question, (c) "Have you regained all the weight you lost?" Those still qualified at this point were asked, "On a scale of 1 to 10, with 1 being no concern and 10 being very great concern, how would you rate your own level of concern about maintenance?" Only those who indicated a level of 6 or above were included in the study.

In summary, prospective participants were disqualified for the following reasons: 10 were trying to lose weight and had not yet reached their goals; 16 had not maintained for at least 6 months; 40 had regained all of their lost weight;

1 reported a low level of concern about maintenance. A further 13 women stated they were unable to attend any of the 4 preliminary sessions.

The 72 women who qualified were asked to attend 1 of 4 preliminary sessions. An effort was made to randomly assign them to any one of the sessions but in many cases individuals had time or transportation restrictions and this dictated which session they attended. Ten women failed to attend their preliminary session, 6 because of family emergencies, transportation difficulties, or weather conditions, 4 for no stated reason.

Of the 62 women who attended the preliminary sessions, two withdrew before signing consent forms or filling in any questionnaires, stating the program as described was not of interest to them. One woman who participated in the study was later discovered to have maintained her weight loss for considerably less than 6 months and consequently her data were not included in any analysis.

The 59 remaining participants ranged in age from 18 to 76, with a mean age of 45.0 (SD = 10.1). The majority (64%) were married or in long-term relationships, 12% were single, and the remaining 24% were separated, divorced, or widowed. Most (79.9%) were employed either full or part time; the rest were retired (6.7%), students (6.7%), or homemakers (6.7%).

Participants were at an average weight of 149.6 lbs (range, 115-202, SD = 18.3), while their average target

weight was 135.5 lbs (range 105-165, SD = 12.6). Less than 20% (n = 11) reported being no more than 5 lbs above their target weights and of these only 5 women were at their goal or a few lbs below it. The average weight loss before any regain had been 33.2 lbs (range 11-120, SD = 19.7).

Although all participants had maintained for at least 6 months, the range was from 6 months to 10 years, with an average of 17.9 months (SD = 17.9). An even greater range was found in how long ago they had lost weight with the range being from 6 months to 24 years and an average of 49.6 months (SD = 58.4). The Demographic Questionnaire used to obtain this information is found in Appendix A.

Exercise status and change. Of the 59 participants, almost 90% (n = 53) described themselves as moderately active or active. Twenty-two percent were more active (n = 13) than when they reached their goal, 37% were less active (n = 22), and the remaining 41% had not changed (n = 24). Walking or jogging or a combination of activities were favored by 81% of participants (n = 48) and 78% exercised 3 or more times a week (n = 46).

Maintenance strategies. Weekly or more frequent weigh-ins were the most frequently used maintenance strategy. Seventy-five percent of the participants reported doing this often (n = 10) or always (n = 34). Charting amounts of food eaten was used by 35% of the participants, either often (n = 12) or always (n = 7). Fifty-four percent of participants reported returning to a stricter eating program



often ( $n = 14$ ) or always ( $n = 12$ ) in response to a weight gain, and 3-5 lbs was the gain specified by 54% ( $n = 32$ ) of those who used this strategy.

### Design and Procedure

Participants were invited to attend 1 of 4 preliminary sessions. Based on which one they attended, they were assigned to one of two experimental conditions or to a waiting list (WL) which served as a control group in a quasi-experimental, repeated measures design. The two treatment conditions were Maintenance Intervention (MI) and Relapse Prevention Intervention (RPI). All groups (MI, RPI, and WL) were tested on the dependent variables of self-efficacy and coping at pretest, posttest, and follow-up. WL participants who were subsequently assigned to treatment groups (MI2 and RPI2) were further tested on the dependent variables at pretest, posttest, and follow-up for those groups. The follow-up testing for the WL group provided the pretest measure for those participants who became part of the MI2 and RPI2 groups. The group formation and testing schedule is shown in Figure 2.

Following preliminary analyses for group differences, the two treatment groups for each condition (MI and MI2; RPI and RPI2) were collapsed for further analysis into MI-C and RPI-C.

Initial groups. Prospective participants, in small groups of 14-18, were asked to attend an 1-hour preliminary session during which the purpose of the research study, the

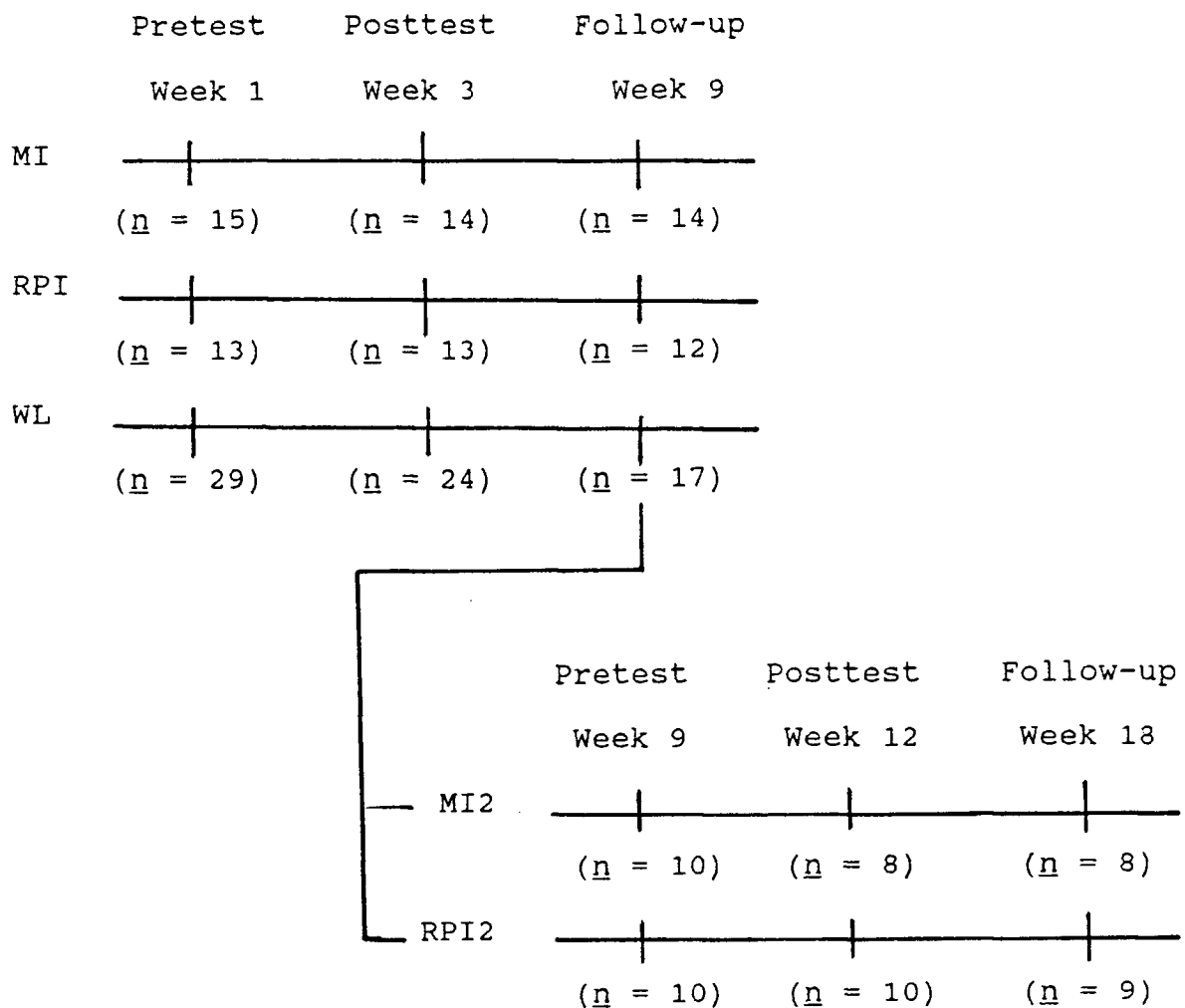


Figure 2. Time-span of Study and Group Formation (MI2 group included 2 pre-screened and qualified participants who did not attend the original preliminary sessions. RPI2 group included 1 WL participant who did not complete the WL posttest questionnaire and so is not included in the 17 WL participants tested at follow-up).

maintenance program itself, and participation requirements were outlined. Once informed consent had been obtained (see Appendix A), participants became part of one of two treatment groups (MI or RPI) or the waiting list (WL). True random assignment of subjects was not possible because the first treatment sessions took place immediately following two of the preliminary sessions. This meant that those who attended the morning preliminary session were assigned to one treatment group and those in the afternoon session to the other. Participants who attended the two remaining preliminary sessions automatically became part of the waiting list, with the understanding that they would be offered treatment 9 weeks later.

By means of a coin toss before the first treatment session, the morning and afternoon groups were randomly assigned to the maintenance intervention (MI) or relapse prevention intervention (RPI) treatment. The number of subjects in each group was: MI = 15, RPI = 13, WL = 29.

Second treatment groups. Eighteen of these 29 WL participants were later assigned to the second treatment groups (MI2 and RPI2) (See Figure 2). Of the original 29 WL subjects, 1 failed to complete the self-efficacy questionnaire at pretest and was among 5 participants who did not return their questionnaires at posttest. When contacted as the second treatment groups were being formed, 7 more were no longer available, leaving 17 WL participants to be assigned to treatment groups.

At this point one of the 5 participants who had not completed the posttest questionnaires phoned the experimenter with a convincing excuse (illness in the family necessitating an unplanned trip) and asked to be included in a treatment group. Consequently, two groups of 10 and 8 were formed, according to participants' ability to attend morning or afternoon sessions. In order to increase the size of the smaller group, 2 women who had been among the 13 prospective participants who were qualified but unable to attend the preliminary sessions were contacted, attended a separate preliminary session, and became part of the group. There were thus 10 participants in each of the MI2 and RPI2 groups. Once again the morning and afternoon groups were assigned to treatment condition by a coin toss.

Combined treatment groups. After preliminary analysis for group differences, the data for the two treatment conditions (MI and MI2; RPI and RPI2) were collapsed for further analysis. The two resulting groups were MI-C with 25 participants and RPI-C with 23 participants.

Testing. Dependent measures of self-efficacy in eating situations and coping in response to negative affect after overeating were assessed at the end of the preliminary session (pretest), at the end of the fourth treatment session (posttest), and by mail 6 weeks afterwards (follow-up) for the two treatment groups, MI, and RPI. The WL group was assessed at the end of the preliminary session (pretest) and 3 weeks later by mail (posttest). Only those WL

participants who carried on into the second treatment groups (MI2 and RPI2) were assessed at follow-up which occurred approximately 9 weeks following their pretest and immediately prior to the first treatment session. The assessment thus also served as the pretest measure for the MI2 and RPI2 groups. Posttest and follow-up measures for MI2 and RPI2 were taken immediately following the fourth treatment session and 6 weeks later by mail.

### Dependent Measures

The Eating Self-Efficacy Scale (ESES). This scale, developed and validated by Glynn and Ruderman (1986), is a measure of self-efficacy in eating situations based on Bandura's (1977) theory of self-efficacy (see Appendix B). Permission was received from Dr. Audrey Ruderman during personal telephone communication in June, 1989 to use the measure for this study.

The scale consists of 25 questions concerning perceived control of eating in a variety of eating situations, some of which are mood-related, others of which involve food cues or social situations. Level of confidence in controlling overeating is measured by a 7-point Likert scale with 1 indicating no difficulty controlling eating and 7 indicating most difficulty controlling eating.

The items in the scale provide a score ranging from 25 to 175, with lower scores indicating higher levels of self-efficacy in eating situations. The score can be subdivided into two subscale scores for Negative Affect (NA, score

range, 15 to 105) and Socially Acceptable Circumstances (SAC, score range, 10 to 70).

The advantage of using this instrument was that it measured self-efficacy as an expectation of control in specific eating situations, rather than as a general expectation of weight control. Obviously, ability to control overeating in a variety of situations is at the basis of an ability to maintain weight loss. Additionally, the authors of this scale have proposed its use with weight loss program participants to test Bandura's (1977) hypothesis that increased self-efficacy promotes increased coping behavior, and this was a focus for the study.

Internal consistency reliability for the scale has been demonstrated (Glynn & Ruderman, 1986). Coefficient alpha (Cronbach, 1951) was .92 for the entire ESES scale, .94 for Negative Affect, and .85 for Socially Acceptable Circumstances. Test-retest reliability over a 7-week period was  $r = .70$ ,  $p < .001$ .

Construct validity was demonstrated by the authors while developing the scale in two studies. In one, ESES scores were compared to other variables with which they were expected to be related (Glynn & Ruderman, 1986) and significant positive correlations were found between ESES scores and Restraint Scale (Stunkard, 1981) scores ( $r = .47$ ,  $p < .001$ ). In the second, construct validity was again demonstrated in a study of gender differences in which positive correlations were shown with total Restraint Scale

scores ( $r[\text{females}] = .52, p < .0001$ ), the concern with dieting subscale of the Restraint Scale ( $r[\text{females}] = .54, p < .001$ ), and the weight fluctuation subscale of the Restraint Scale ( $r[\text{females}] = .39, p < .0001$ ).

The norms were established using 484 female undergraduate psychology students, only some of whom ( $n = 72$ ) were overweight by self-report according to Metropolitan Life Insurance Company norms (1959). Mean ESES scores did not differ among the overweight and normal weight subjects, but the mean ESES score was significantly higher among self-reported dieters ( $n = 217, M = 87.2, SD = 25.08$ , range 33-148) than among non-dieters ( $n = 267, M = 74.1, SD = 27.3$ , range 25-155;  $t(391) = 4.96, p < .0001$ ).

Ways of Coping Checklist (WCCL). The Ways of Coping Checklist is based on the Lazarus and Folkman (1984, p. 141) definition of coping as the cognitive and behavioral efforts an individual makes to manage specific external and/or internal demands which are appraised as taxing or exceeding his or her resources. Reliability and validity information concerning the original WCCL (Folkman & Lazarus, 1980) is found in Appendix B.

The WCCL used in this study is a revision by Vitaliano, Russo, Carr, Maiuro, and Becker (1985) of the 67-item version of the scale by the developers, Lazarus and Folkman (1984). The Vitaliano et al. revision shortened the scale to 42 items, reduced the number of subscales from 8 to 5, and kept the 4-point scoring scale. The five subscales

Vitaliano et al. identified are designated as Problem-focused, Seeks Social Support, Blamed Self, Wishful Thinking, and Avoidance.

The norms for the Vitaliano et al. (1985) revised WCCL were established with samples of medical students, Alzheimer spouses, and psychiatric outpatients. The researchers compared the internal consistency coefficients of the original WCCL and their revision on their samples of 452 medical students, 62 spouses of patients with Alzheimer's disease, and 83 psychiatric outpatients. They found coefficient alphas for each of their five subscales to be equal to or better than those found for the original WCCL. In addition, they found that their revised scales had substantially less overlap than the original scales.

In assessing construct validity for their revision of the WCCL, Vitaliano et al. (1985) looked for patterns of consistency in how their subject populations appraised situations and the type of coping strategy used, both in the original WCCL and in their version. Criterion-related validity was assessed using the medical student sample.

Scoring for the revised WCCL is done in terms of frequency of use of specific coping strategies. For each of the 42 items, the individual indicates on a 4-point Likert-type scale whether the strategy is not used (0), used somewhat (1), used quite a bit (2), or used a great deal (3). These item scores can be summed to produce raw scores for each of the 5 subscales. The range of raw scores



possible for each subscale are as follows: Problem-focused, 0-45, Seeks Social Support, 0-18, Blamed Self, 0-9, Wishful Thinking, 0-24, and Avoidance, 0-30.

Vitaliano, Maiuro, Russo, and Becker (1987) compared the use of raw and relative coping scores and found that the relative score provided more information. Instead of measuring the amounts of different types of coping responses, they felt it made more sense to look at what proportion of total coping responses each type represented. While two individuals might have the same raw score for Planful problem-solving, for example, that score might represent 10% of one person's overall coping and 30% of another's. When measuring changes in a particular type of coping response, such as problem-focused coping, across time, increased or decreased relative scores would be a better indicator of change than a simple increase in the amount of one or more types of coping. In the present study, the relative percentage of subscales to total coping efforts was of interest, particularly the subscale of Problem-focused coping.

Relative coping scores were computed by using Vitaliano et al.'s (1987) formula of (a) finding the average item score for a given subscale by dividing the raw score for that scale by the number of items on it, (b) calculating the sum of the average item scores on all five subscales, and (c) dividing the average item score for a given subscale by the sum of the average item scores on all five subscales.

### Ancillary Measures

A 3-item expectancy scale was used to assess client credibility in treatment and expectancy for improvement (see Appendix C). This was done so that differences in outcome between the two intervention groups could be plausibly attributed to specific intervention ingredients and not to differences in expectancies between the groups.

As part of the demographic questionnaire (see Appendix A), participants were asked to respond to three questions about causal attribution. These were taken from Russell's (1982) Causal Dimension Scale and relate to locus of causality, stability, and controllability.

### Therapist Qualifications

The intervention sessions were conducted by the experimenter, an M.A. student in Counselling Psychology. She has a background in Psychology and has worked in the field of weight management for seven years. To assess experimenter bias in the presentation of the MI and RPI interventions, all participants were asked to complete a short evaluative questionnaire after each session (see Appendix C).

At the preliminary sessions, the experimenter was assisted by Carolyn Tees, B.A., Psychology, who remained in the treatment room to answer questions and collect completed questionnaires while the experimenter supervised participants' weigh-ins.

## Treatments

The program for both treatment groups was as similar as possible with the same information given and topics introduced in a 1-hour group discussion format. The only difference was that in the RPI condition, approximately 5-10 minutes of each session was reserved for information about and discussion of relapse prevention.

Subjects in both treatment conditions met in groups for a series of 4 1-hour sessions. The main treatment components in both the MI and the RPI groups were (a) short information segments on topics such as effective maintenance strategies, body image, emotional eating, etc., (b) group participation in discussions which the experimenter kept focused on the topic under discussion or other maintenance-related issues as these emerged, and (c) suggested homework assignments given at the end of each session. The format of the sessions was informal; semi-structured discussions took place in an atmosphere of support where all opinions expressed were respected as valid. Confidentiality norms were discussed and agreed upon in each group.

Participants weighed themselves in a private alcove in the experimenter's presence and recorded their weights before Session 1 and at the end of Session 4. The scale was available at other sessions but no record of weights was made.

During Session 1, each participant was given a Participant Workbook which consisted of several sheets of

looseleaf paper for notes and 4 Overeating Logs in a Duo-Tang binder. The Workbooks for the RPI groups also contained a representation of the Relapse Prevention Model (see Figure 1).

A complete treatment manual is available upon request from the experimenter.

### Data Analysis

Descriptive statistics were calculated. Preliminary analyses were conducted using a one-way multivariate analysis of variance (MANOVA) to test for pretreatment differences among the treatment conditions and waiting list groups (MI, RPI, WL; MI2, RPI2; MI-C, RPI-C) on the two dependent variables (self-efficacy and relative use of problem-focused coping) and other descriptive variables. A two-way (Group x Time) repeated measures MANOVA, with two pre-planned nonorthogonal contrasts (pretest to posttest) (posttest to follow-up) using Dunn's test for significance at .025, was performed for both dependent measures (self-efficacy and coping) to test the hypotheses of group differences (Hypotheses 1 to 4). Three separate analyses were performed. For the first analysis, the groups were RPI, MI and WL, and for the second, the groups were MI2 and RPI2. The combined groups, MI-C and RPI-C, were used for the final analysis.

A one-way ANOVA was calculated for pre-measures of expectancy for change. A Pearson product-moment correlation matrix was calculated for pretest, posttest, and follow-up

data. Hypothesis 5 was tested with a correlation coefficient for the posttest problem-focused coping and follow-up self-efficacy variables. Clinical significance was assessed using the method for evaluating change suggested by Jacobson and Revenstorf (1988) for this purpose.

## RESULTS

### Group Comparability

The means and standard deviations of descriptive variables for all groups of participants are shown in Table 1. A preliminary analysis was done using a one-way multivariate analysis of variance (MANOVA) to test for pretreatment differences among the two treatment conditions, MI ( $n = 15$ ), RPI ( $n = 13$ ), and the waiting list, WL ( $n = 29$ ), on age, weight, total weight loss, lbs above target weight, how long ago weight was lost, and how long weight loss was maintained within 5 lbs. No significant multivariate Group effect was found,  $F < 1$ . The same analysis was done separately for differences between the two Maintenance Intervention groups, MI ( $n = 15$ ) and MI2 ( $n = 10$ ), and for differences between the two Relapse Prevention Intervention groups RPI ( $n = 13$ ) and RPI2 ( $n = 10$ ). Again, no significant multivariate Group effect was found,  $F < 1$ ; and  $F(6,16) = 1.51$ ,  $p = .24$ , respectively. Finally, when the data for the two sets of treatment groups were collapsed, the same analysis was done for pretreatment differences between the MI-C ( $n = 25$ ) and RPI-C ( $n = 23$ ) groups. No significant multivariate Group effect was found,  $F(6,41) = 1.00$ ,  $p = .44$ .

The 5 marital status categories in the demographic questionnaire were reduced to 2 for analysis: Married, and Single, comprising single, widowed, separated, and divorced. Similarly, the 5 employment status categories were reduced

Table 1

Means and Standard Deviations for Descriptive DataInitial Groups

	MI Maintenance Intervention ( <i>n</i> = 15)		RPI Relapse Prevention Intervention ( <i>n</i> = 13)		WL Waiting List ( <i>n</i> = 29)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
age	44.7	7.7	44.7	9.0	45.5	12.1
weight	155.6	18.5	146.2	14.1	149.5	19.5
target weight	138.5	10.8	135.8	14.3	134.3	13.1
total loss	39.5	22.7	29.7	13.5	32.0	20.8
amount of regain	17.1	14.4	10.3	6.3	15.2	10.7
how long ago was wt. lost	72.1	86.5	41.3	37.0	42.9	48.5
how long was wt. loss maintained	24.1	24.9	12.0	11.3	17.7	16.2

Combined Treatment Groups and All Participants

	MI-C Maintenance Intervention ( <i>n</i> = 25)		RPI-C Relapse Prevention Intervention ( <i>n</i> = 23)		All Participants ( <i>n</i> = 59)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
age	45.4	9.5	43.7	9.7	45.0	10.1
weight	152.5	20.9	149.1	15.4	149.6	18.3
target weight	134.8	11.3	137.2	13.8	135.5	12.6
total loss	37.6	19.2	33.7	22.4	33.2	19.7
amount of regain	17.7	15.5	11.9	5.9	14.1	11.3
how long ago was wt. lost	69.4	78.7	38.0	34.5	49.6	58.4
how long was wt. loss maintained	21.2	20.1	15.1	14.3	18.0	17.9

Note. All weights are in lbs and all times stated are  
in months.

to 2: Employed, comprising full-time and part-time employed, and Unemployed, comprising students, full-time housewives, and retired people. The variables of marital status and employment status were then examined by separate chi-square tests of independence for MI, RPI, and WL groups, then for MI-C and RPI-C groups. No significant group differences were found (marital status,  $\chi^2 (2, n = 57) = 3.73, p = .16$ , and  $\chi^2 (1, n = 48) = 2.02, p = .16$ , respectively; employment status,  $\chi^2 (2, n = 57) = .04, p = .98$ , and  $\chi^2 (1, n = 48) = .02, p = .89$ , respectively).

#### Attrition

One participant dropped out of the MI group before Session 2 because of job responsibilities. One participant in the RPI group failed to return the follow-up questionnaires even after being recontacted. This meant that 14 out of the 15 MI participants completed the program, and 12 out of the 13 RPI participants did so.

The drop-outs from the WL group are discussed under the heading of Subjects in the Methods section and summarized here. At posttest, 5 participants failed to return their questionnaires. No follow-up had originally been planned for this group but because the first treatment session for these participants coincided with the time-span for follow-up assessment, these data were collected for the 17 WL participants (original  $n = 29$ ) who carried on into treatment groups.



In the second treatment groups, of the 10 RPI2 participants, one did not return her follow-up questionnaires even after being recontacted and sent a replacement set. Of the 10 MI2 participants, two women failed to attend 3 out of the 4 Saturday sessions. One woman was unexpectedly called away on business for two weekends; the second missed one session due to illness and the last session because of weather conditions. Thus, 9 out of 10 RPI2 participants completed the study and 8 out of 10 MI2 participants did so.

After the preliminary analyses described above to rule out significant pretest differences between the MI and the MI2 groups and between the RPI and RPI2 groups, the data were collapsed for further analysis. The combined treatment groups were renamed MI-C and RPI-C. MI-C had a total of 25 participants, 22 of whom completed the study. RPI-C had a total of 23 participants, 21 of whom completed the study.

#### Pretest Dependent Measures

Examination of the pretest means for the dependent measures of self-efficacy and problem-focused coping suggests large differences between all 3 groups of subjects, MI, RPI, and WL (see Table 2 and Table 3). Such differences could threaten the internal validity of the study if there was (a) a ceiling or floor effect, or (b) reason to think that these initial differences produced a differential interaction with treatment.

Table 2

Means and Standard Deviations for Self-Efficacy for All Groups

Group	Pretest		Posttest		Follow-up	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
MI ( <u>n</u> = 14)	100.4	29.9	101.1	25.8	94.9	22.4
RPI ( <u>n</u> = 12)	119.3	17.9	115.7	13.9	115.8	13.0
WL ( <u>n</u> = 17)	115.2	30.4	112.8	29.1	115.7	20.6
MI2 ( <u>n</u> = 8)	104.5	15.1	97.9	21.3	89.3	30.4
RPI2 ( <u>n</u> = 9)	129.2	25.8	105.4	34.1	103.0	25.6
MI-C ( <u>n</u> = 22)	100.9	25.2	100.0	23.8	92.9	25.0
RPI-C ( <u>n</u> = 21)	123.6	21.6	111.3	24.5	110.3	20.0

Note. Group numbers are different from those of original groups because only the data of participants who were assessed at all 3 times of testing are included here. Lower scores for self-efficacy = higher levels of self-efficacy.

Table 3

Means and Standard Deviations for Percentage of Problem-focused Coping for all Groups

Group	Pretest		Posttest		Follow-up	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
MI ( <u>n</u> = 14)	.27	.12	.27	.10	.29	.11
RPI ( <u>n</u> = 12)	.19	.08	.23	.14	.27	.17
WL ( <u>n</u> = 17)	.19	.10	.20	.12	.21	.11
MI2 ( <u>n</u> = 8)	.25	.15	.30	.15	.32	.13
RPI2 ( <u>n</u> = 9)	.16	.09	.22	.18	.22	.11
MI-C ( <u>n</u> = 22)	.27	.13	.28	.12	.30	.11
RPI-C ( <u>n</u> = 21)	.18	.08	.22	.16	.25	.15

Note. Group numbers are different from those of original groups because only the data of participants who were assessed at all 3 times of testing are included here.

A preliminary analysis using a one-way MANOVA to test for pretreatment differences among the three groups (MI, RPI, and WL) on the two dependent measures revealed a significant Group effect,  $F(4,104) = 3.01, p < .02$ . Univariate analysis of variance (ANOVA) for each dependent measure revealed no significant difference for self-efficacy,  $F(2,53) = 2.70, p = .08$ , and a significant difference for problem-focused coping,  $F(2,53) = 4.95, p < .01$ . A MANOVA done to test for pretreatment difference between the second treatment groups (MI2 and RPI2) revealed no significant Group effect for the two dependent measures,  $F(2,17) = 2.96, p = .08$ . Finally, a MANOVA done to test for pretreatment differences between the combined treatment groups MI-C and RPI-C revealed a significant multivariate Group effect,  $F(2,45) = 7.04, p < .002$ . Separate ANOVAs for the two dependent measures showed significant Group effects for self-efficacy,  $F(1,46) = 11.40, p < .002$ , and for problem-focused coping,  $F(1,46) = 8.96, p < .004$ .

Despite initially lower ESES scores (indicating higher levels of self-efficacy) and higher percentages of problem-focused coping in the MI and MI2 groups, all group means showed similar and variable patterns of change across time as is shown in Table 2 and Table 3. Again, despite initially better scores on both dependent measures in the MI and MI2 groups, no participant in these groups scored below 37 on the ESES (lowest possible score is 25), or above 57% (of a possible 100%) for percentage of problem-focused coping.

### Expectations of Treatment Effectiveness and Session Evaluations

Analysis of variance for the initial treatment groups, MI and RPI, on summed responses to 3 questions relating to expectations of treatment effectiveness (see Appendix C) at pretest revealed no significant group difference,  $F(1,24) = 1.37$ ,  $p = .25$ . The same analysis for the second treatment groups, MI2 and RPI2, at pretest revealed no significant group difference,  $F(1,14) = 1.95$ ,  $p = .18$ . Finally, when the groups were combined as MI-C and RPI-C, the ANOVA on expectancy at pretest showed no significant group difference,  $F(1,40) = 2.65$ ,  $p = .11$ . Therefore, the treatment groups did not differ in their initial expectations of treatment effectiveness.

Analysis of variance for the initial treatment groups, MI and RPI, on summed responses to 4 questions relating to evaluation of treatment sessions (see Appendix C) which were administered following the second and third sessions revealed no significant group difference for the second session,  $F(1,19) = 2.73$ ,  $p = .15$ , or for the third session,  $F < 1$ . The same analysis for the second treatment groups, MI2 and RPI2, revealed no significant group difference for the second session,  $F < 1$ , or the third session,  $F(1,13) = 1.24$ ,  $p = .29$ . Therefore, the treatment groups did not differ in their evaluations of treatment sessions.

### Hypothesized Treatment Effects on Dependent Measures

To test hypotheses 1 to 4, a two-way (Group x Time) repeated measures MANOVA, with two preplanned nonorthogonal contrasts (pretest to posttest) (posttest to follow-up) using Dunn's test for significance at .025 was performed for the dependent measures of self-efficacy and percentage of problem-focused coping for the original treatment groups (MI and RPI) and the WL group. No significant multivariate Group effect was found,  $F(4,78) = 1.95$ ,  $p = .11$ . No significant multivariate pretest to posttest Time effect, or posttest to follow-up Time effect was found,  $F < 1$ , and  $F(2,39) = 1.17$ ,  $p = .32$ , respectively. No significant Group x Time interaction effect was found (pretest to posttest, posttest to follow-up, both  $F_s < 1$ , respectively). Therefore the treatment groups did not show significant differential change over time from the waiting list group.

The same analysis was done for the second treatment groups, MI2 and RPI2, that had been formed from the WL. No significant Group effect was found,  $F(2,14) = 1.32$ ,  $p = .30$ . No significant Time effect was found for pretest to posttest,  $F(2,14) = 2.60$ ,  $p = .11$ , nor was there a significant Time effect for posttest to follow-up,  $F < 1$ . No significant Group x Time interaction effect was found at pretest to posttest, or posttest to follow-up, both  $F_s < 1$ , respectively.

The same analysis was done for the combined treatment groups, MI-C and RPI-C. The multivariate Group effect

approached significance,  $F(2,40) = 4.00$ ,  $p < .026$ . Because of this, the univariate Group effect was examined for self-efficacy and found to be significant,  $F(1,41) = 7.22$ ,  $p < .01$ . Time effects were not significant at pretest to posttest,  $F(2,40) = 2.62$ ,  $p = .09$ , and at posttest to follow-up,  $F(2,40) = 2.64$ ,  $p = .08$ . No significant Group x Time interaction effect was found (pretest to posttest,  $F(2,40) = 1.17$ ,  $p = .32$ ; posttest to follow-up,  $F(2,40) = 1.43$ ,  $p = .25$ ). Although the multivariate Group effect only approached significance, an examination of the means suggests that overall the MI-C group was higher than the RPI-C group on self-efficacy.

Multivariate and univariate analyses results for each of the groups are found in Appendix D.

To test hypothesis 5, a Pearson product-moment correlation matrix for posttest and follow-up was calculated for the combined groups, MI-C and RPI-C ( $n = 48$ , total). The percentage of problem-focused coping at posttest had a significant negative correlation with self-efficacy (lower scores = higher self-efficacy) at follow-up for these groups ( $r = -.34$ ,  $p < .013$ ) (see Table 4). Therefore, greater relative use of problem-focused coping at posttest predicted higher levels of self-efficacy at follow-up for both treatment groups.

Table 4

Correlation Matrix for Dependent Measures and Subscales  
at Pretest, Posttest, and Follow-up for Combined  
Treatment Groups, MI-C and RPI-C

	SELFEFF1	SELFEFF2	SELFEFF3	NEGAFF1	NEGAFF2	NEGAFF3	SOCSIT1	SOCSIT2	SOCSIT3	PERCENT1	PERCENT2
SELFEFF1											
SELFEFF2	.5424**										
SELFEFF3	.6361**	.8712**									
NEGAFF1	.9144**	.5296**	.6502**								
NEGAFF2	.5115**	.9089**	.8394**	.6240**							
NEGAFF3	.5785**	.7978**	.9127**	.7041**	.9165**						
SOCSIT1	.5417**	.2303	.2014	.1550	-.0367	-.0570					
SOCSIT2	.2421	.5164**	.3529	-.0195	.1123	.0116	.6241**				
SOCSIT3	.3152	.4203*	.4889**	.0816	.0895	.0897	.6124**	.8352**			
PERCENT1	-.5248**	-.4427*	-.5269**	-.4983**	-.4114*	-.4650**	-.2458	-.2100	-.2915		
PERCENT2	-.2186	-.3489*	-.3402	-.2747	-.3990*	-.3951*	.0319	-.0120	.0142	.4007*	
PERCENT3	-.2320	-.2849	-.3784*	-.3305	-.3506	-.4284*	.1252	.0451	-.0076	.5448**	.5840**
PCB1	.2183	.1140	.0972	.1853	.1101	.0318	.1480	.0455	.1689	-.4086*	-.1965
PCB2	.0764	.0714	-.1030	-.0012	-.0234	-.2061	.1867	.2182	.1890	-.2086	-.3392
PCB3	.2709	.1893	.1705	.1785	.1150	.0299	.2954	.2187	.3517	-.4354*	.0769
PCW1	.2033	.2434	.3451	.2417	.2947	.3901*	-.0057	-.0252	.0084	-.6335**	-.4404*
PCW2	.0985	.2440	.2979	.2315	.3410	.4085*	-.2339	-.1189	-.1459	-.4184*	-.6580**
PCW3	-.0453	.0725	.2026	.1270	.1714	.3187	-.3834*	-.1847	-.1866	-.3329	-.5256**
PCA1	.2101	.2944	.3382	.2192	.3151	.3440	.0575	.0544	.0900	-.4237*	.0340
PCA2	.0928	.0873	.1123	.1950	.2684	.3401	-.1733	-.3431	-.4521*	-.1424	-.4788**
PCA3	.1757	.2087	.3267	.3284	.3805*	.4972**	-.2612	-.2938	-.2651	-.1984	-.5962**
PCS1	-.0606	-.1579	-.1734	-.0920	-.2541	-.2130	.0433	.1455	.0322	.3288	.1100
PCS2	.0655	.1189	.2068	.0266	.0661	.1214	.1039	.1476	.2450	.1416	-.0854
PCS3	-.1272	-.0893	-.1562	-.1547	-.1229	-.1368	.0123	.0414	-.0887	.3400	.0619
	PERCENT3	PCB1	PCB2	PCB3	PCW1	PCW2	PCW3	PCA1	PCA2	PCA3	PCS1
PCB1	-.3060										
PCB2	-.0642	.4893**									
PCB3	-.3170	.4252*	.5098**								
PCW1	-.4963**	.1294	-.0478	.1306							
PCW2	-.6002**	.1560	-.0325	-.1342	.7296**						
PCW3	-.7071**	.1215	-.1430	-.1179	.6267**	.8117**					
PCA1	-.1056	-.2907	.0008	.3972*	.1729	-.0519	-.1600				
PCA2	-.2834	-.2315	-.0283	-.1552	.2228	.3258	.2543	.2928			
PCA3	-.4899**	-.0571	-.1937	-.3335	.4254*	.6464**	.5100**	-.0046	.6337**		
PCS1	.2658	-.5002**	-.3112	-.5470**	-.4344*	-.2627	-.1098	-.4054*	-.0657	-.0590	
PCS2	.0195	-.1965	-.4816**	-.3638*	-.1708	-.2076	-.0693	-.2048	-.3198	-.0402	.4407*
PCS3	.1430	-.2519	-.3287	-.5830**	-.4643**	-.3054	-.2824	-.2298	-.1121	-.1097	.5507**

\* - SIGNIF. LE .01    \*\* - SIGNIF. LE .001    (1-TAILED, " . " PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)



## Key for Tables 4 and 5

Numerals	1 = pretest, 2 = posttest, 3 = follow-up.
SELFEFF	Eating Self-efficacy Scale (ESES).
NEGAFF	Negative Affect (NA) subscale of ESES.
SCOSIT	Socially Acceptable Circumstances (SAC) subscale of ESES.
PERCENT	Percentage of Problem-focused coping.
PCB	Percentage of Blames Self coping.
PCW	Percentage of Wishful Thinking coping.
PCA	Percentage of Avoidance coping.
PCS	Percentage of Seeks Social Support coping.
V4	Age.
V6	Weight.
V7	Target or goal weight.
V8	Total weight lost.
V9	How long ago weight was lost.
V10	How long weight loss was maintained within 5 lbs
EX1	Exercise status: sedentary, mod. active, active.
EX2	Exercise change: more active, no change, less active.
MN2	Weekly weigh-ins.
MN5	More restricted eating program after gain.
DIFF1	Weight regained in lbs.
GAIN	Weight regained as percentage of total lost.
COPING	Raw score of total coping responses.
M1C2	Attribution scale: causality.
M1C3	Attribution scale: controllability.
M1C4	Attribution scale: permanence.

### Dependent Measures: Correlations

The correlation found between problem-focused coping and self-efficacy raised the question of whether other relationships might be found between the two dependent measures of coping and self-efficacy. Any such relationships must be interpreted with caution as they were not hypothesized and since a number of the correlates are not independent, an adjusted level of alpha is therefore required.

The coping scale has 4 other subscales besides problem-focused coping (avoidance, wishful thinking, self-blame, and seeking social support) and the self-efficacy scale contains 2 subscales, Negative Affect and Socially Acceptable Circumstances. It was considered important to look at these subscales to see if there were associations between them. A Pearson product-moment correlation matrix was calculated for the combined treatment groups, MI-C and RPI-C, to look at these and other variables of interest. The matrix is found in Table 4.

Self-Efficacy, coping, and coping subscales. The dependent measure of self-efficacy (lower scores = higher self-efficacy) showed a negative correlation with percentage of problem-focused (PF) coping at pretest ( $r = -.52$ ), posttest ( $r = -.35$ ), and follow-up ( $r = -.38$ ) and a positive correlation. Self-efficacy was not associated with any other coping subscale except with avoidance at follow-up ( $r = .33$ ).

The Negative Affect subscale of the self-efficacy score showed similar negative correlations with percentage of PF coping at all three times of testing (see Table 4). The Negative Affect subscale had weak to moderate positive correlations with relative use of avoidance and wishful thinking coping at posttest and follow-up, and with wishful thinking at pretest as well. Higher scores on the Negative Affect subscale represent lower levels of self-efficacy for controlling overeating in response to negative feelings, so it appears that the relative use of avoidance and wishful thinking coping are also associated with these feelings when self-efficacy levels are low.

Interrelations among the coping subscales. The relative use of problem-focused coping was negatively correlated with the relative use of avoidance, wishful-thinking, and self-blame coping responses at pretest, posttest, and follow-up (see Table 4). At pretest only, relative use of problem-focused coping had a positive correlation with relative use of seeking social support coping ( $r = .33$ ). Relative use of self-blame coping was found to have a negative correlation with problem-focused and social support coping at pretest, posttest and follow-up, and with avoidance coping at pretest and follow-up. Relative use of avoidance and wishful-thinking coping were found to have a positive correlation at posttest and follow-up. From this it appears that higher relative use of problem-focused coping is associated with lower relative use

of all other types of coping except perhaps seeking social support, and higher relative use of self-blame is not related to higher use of any other type of coping. It also appears that higher relative use of avoidance and wishful thinking coping are likely to occur together.

Additional correlations. Because specific maintenance strategies have been a focus of interest in other maintenance studies and because other research has found a relationship between age and relative use of different types of coping (Folkman et al., 1987), a Pearson product-moment correlation matrix for all 59 participants in the study was calculated for pretest relationships between the dependent measures and some descriptive variables (see Table 5). There was a weak positive correlation between relative use of self-blame coping and age ( $r = .25$ ) and a weak negative correlation between relative use of seeks social support coping and age ( $r = -.31$ ), indicating that older participants were more likely to blame themselves for overeating and younger ones to seek support from others.

The maintenance strategy of weekly monitoring of weight was found to have a negative correlation with the amount of weight regained ( $r = -.36$ ), current weight ( $r = -.31$ ), and total weight loss ( $r = -.22$ ). This indicates that the person who monitors weight regularly has regained less weight, but also had lost less to begin with.

The maintenance strategy which involved returning to a more restricted eating program when weight was regained had

Table 5

Correlation Matrix for Dependent Measures and Other  
Variables at Pretest for all Participants

	V4	V6	V7	V8	V9	V10	EX1	EX2	MN2	MN5	DIFF1
V4											
V6	.0250										
V7	.1679	.7964**									
V8	.0065	.4937**	.3621*								
V9	.0807	.2323	.0903	.1442							
V10	-.0263	.0482	-.0049	.3183*	.6110**						
EX1	-.1472	.0453	.2608	.1184	-.1363	.0081					
EX2	-.1543	-.1178	-.0413	-.0370	-.2262	-.0989	.1286				
MN2	-.0341	-.3096*	-.1298	-.2183	-.1401	-.0925	-.0384	-.1046			
MN5	-.1276	-.1042	-.1681	.0950	.0633	.1531	.0237	-.0568	.2579		
DIFF1	-.1471	.7368**	.1778	.3985**	.2770	.0839	-.2179	-.1455	-.3585*	.0184	
GAIN	-.0436	.3630*	-.0593	-.2883	.1376	-.1702	-.3235*	-.1503	-.1745	-.0955	.6570**
SELFEFF1	-.0656	.0661	.0624	.0497	-.0271	-.0689	-.0766	-.0609	-.0079	-.2159	.0377
NEGAFF1	-.0240	.1298	.1395	.2240	.0321	.0162	.0069	-.0888	-.0624	-.1791	.0552
SOCSIT1	-.1057	-.1047	-.1327	-.3316*	-.1277	-.1942	-.1937	.0348	.1064	-.1483	.0220
COPING1	.0286	-.0335	-.0247	.0436	-.0240	.2077	-.0443	.2857	.0463	.0907	-.0270
PERCENT1	.0093	-.0656	-.0164	-.1149	.0711	.0503	.0866	.0472	.1917	.3029	-.0886
PCB1	.2537	.2278	.2067	.0787	-.0580	.0862	-.0435	-.1080	-.0109	-.0775	.1400
PCW1	-.0159	.0977	.0555	.1572	.2396	.0519	-.1476	-.0629	-.2400	-.1061	.0971
PCA1	.0499	-.1243	-.1290	-.0219	-.0223	-.0417	-.1066	-.0429	.0535	-.2209	-.0583
PCS1	-.3052*	-.1912	-.1781	-.0943	-.2078	-.1660	.1570	.1529	-.0053	.0078	-.1123
M1C2	-.1877	-.1773	-.2153	-.0911	.0181	-.0471	.0607	.0101	.2121	.2032	-.0479
M1C3	.0717	.1191	.0441	.0718	.0613	.0893	.0574	-.1106	.1391	-.1032	.1444
M1C4	.0652	-.2853	-.2915	.0954	-.1443	.1125	.0567	.0305	.0768	.3631*	-.1383
	GAIN	SELFEFF1	NEGAFF1	SOCSIT1	COPING1	PERCENT1	PCB1	PCW1	PCA1	PCS1	M1C2
SELFEFF1	-.0279										
NEGAFF1	-.1286	.9063**									
SOCSIT1	.1918	.5332**	.1257								
COPING1	-.0650	.3963*	.4260**	.0817							
PERCENT1	-.0499	-.4073**	-.4026**	.1525	.1488						
PCB1	.0902	.0468	.0221	.0645	-.0381	.5098**					
PCW1	-.0260	.2018	.2544	-.0314	.0014	-.6644**					
PCA1	.0216	.1872	.2564	-.0689	-.0514	-.4063**	.2062				
PCS1	-.0383	.0693	.0012	.1568	.2254	.3798*	-.6996**	.1497			
M1C2	.0346	.2257	-.2504	-.0288	-.1740	.2252	-.5271**	-.2440			
M1C3	.1269	.1047	.1610	-.0765	.2740	-.2754	-.0389	.0711	.1252		
M1C4	-.1562	-.0997	-.0450	-.1439	-.0008	.0036	-.0892	.0867	.0742	.2701	
						.1254	-.1323	.0056	.0437	-.0158	.1077
M1C3											
M1C4	-.0411										

\* - SIGNIF. LE .01    \*\* - SIGNIF. LE .001    (1-TAILED, " " PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

a positive correlation with relative use of problem-focused coping at pretest ( $r = .31$ ).

Amount of regain was positively correlated with how long ago weight was lost ( $r = .28$ ). Amount and percent of regain were negatively associated with exercise ( $r = -.22$ ;  $r = -.32$ , respectively) indicating that those who are more active have regained a lower percentage of the weight they lost.

### Clinical Significance

Using the formula described by Jacobson and Revenstorf (1988) for assessing the clinical significance of treatment programs, individual participants' scores on the two dependent measures of self-efficacy and percentage of problem-focused coping were examined at posttest (for change from pretest to posttest) and at follow-up (for change from posttest to follow-up and from pretest to follow-up).

The cut-off point for each dependent measure was obtained using the standard deviation and mean of the normative sample and the standard deviation and mean of the sample used in this study. In the case of the Eating Self-Efficacy Scale, the normative sample used was the group classified as dieters by the developers of the scale (Glynn & Ruderman, 1986). This was done because this group most resembled the participants in the study in terms of their concern with weight status.

In the case of the revised Ways of Coping Checklist (Vitaliano et al., 1985), the normative sample used was the

group of spouses of Alzheimer's disease patients. Although this group was older ( $M = 65.8$ ,  $SD = 9.2$ ) than the sample in the present study, 63% of the participants were female, and of all 3 normative sample groups, this was the one with the highest relative use of problem-focused coping ( $M = .26$ ,  $SD = .11$ ).

Once the cut-off points had been established for each dependent measure, the individual scores of participants in each of the groups were assessed for change from pretest to posttest and from pretest to follow-up using this criterion. Following the recommendation of Jacobson and Revenstorf (1988) that the magnitude of change should be sufficient to render it unlikely ( $p < .05$ ) that it could be an artifact of measurement error, their formula for reliable change index was used along with the change point as a two-fold criterion for clinical significance. See Erratum, next page.

Self-efficacy. Table 6 shows the number and percentages of participants in each group who after assessment by the criterion described showed clinically significant change on the two dependent measures. The cut-off point for self-efficacy scores was determined to be 100 and the amount of change above the probability level to be 7.5. For the combined MI-C group ( $n = 22$ ), there were participants who improved, got worse, or stayed the same across testing times with a final total from pretest to follow-up of 8 (36%) who improved, 1 (5%) who got worse, and 13 (59%) who showed no change. These results are misleading

Erratum: While the Jacobson and Revenstorf (1988) formula was used to establish the change point score, a modified and less conservative formula was used for the reliable change index, thus increasing the possibility of reporting chance findings as significant change. For this reason, clinical significance is used in this study descriptively to examine the effect of the program on individual participants, rather than definitively to evaluate program effectiveness.



Table 6

Clinically Significant Change within Combined Treatment Groups

Self-Efficacy

	Number and percentage of participants		
	Improved	Got Worse	Stayed the Same
Pretest to Posttest			
MI-C (n = 22)	4 (18%)	2 (9%)	16 (73%)
RPI (n = 21)	4 (19%)	2 (10%)	15 (71%)
Posttest to Follow-up			
MI-C	4 (18%)	0 (0%)	18 (82%)
RPI-C	2 (10%)	0 (0%)	19 (90%)
Pretest to Follow-up			
MI-C	8 (36%)	1 (5%)	13 (59%)
RPI-C	6 (28%)	2 (10%)	13 (62%)

Percentage of Problem-focused Coping

	Number and Percentage of Participants		
	Improved	Got Worse	Stayed the Same
Pretest to Posttest			
MI-C (n = 22)	5 (23%)	2 (9%)	15 (68%)
RPI-C (n = 21)	4 (19%)	2 (10%)	15 (71%)
Posttest to Follow-up			
MI-C	4 (18%)	2 (9%)	16 (73%)
RPI-C	2 (10%)	0 (0%)	19 (90%)
Pretest to Follow-up			
MI-C	5 (22%)	1 (5%)	16 (73%)
RPI-C	7 (33%)	2 (10%)	12 (57%)

since there were participants who improved substantially without reaching the change score point and some who started below this point and stayed the same or improved. Of interest is the fact that at pretest, there were 7 (32%) participants who had scores at or below the change point; at posttest, there were 11 (50%), and at follow-up, 14 (64%). For the RPI-C group ( $n = 21$ ), from pretest to follow-up, 6 (28%) participants improved, 2 (10%) got worse, and 13 (62%) stayed the same. Once again there were participants who improved without reaching the change score point and a few who were below it from the start. In this group there were 2 (10%) participants at or below the change score at pretest, 5 (24%) at posttest, and 7 (33%) at follow-up. This pattern of improvement in both groups indicates a possible ongoing improvement, especially since it is mirrored in the clinical significance results for problem-focused coping.

Problem-focused coping. For the dependent measure of percentage of problem-focused coping, the cut-off point was determined to be .24 and the amount of change above the level of probability to be .04. For the combined MI-C group from pretest to follow-up 5 (22%) participants improved, 1 (5%) got worse, and 16 (73%) stayed the same, with the same qualifications as there were for self-efficacy. Almost half ( $n = 10$ , 45%) of the participants had scores at or above .24 at pretest, with 12 (55%) at posttest, and 15 (68%) at follow-up who had scores at or above the change point.

In the RPI-C group from pretest to follow-up, 7 (33%) participants improved, 2 (10%) got worse, and 12 (57%) stayed the same, again with some improved scores that did not reach the change score point. At pretest, 7 (33%) participants were at or above the change point, at posttest, 7 (33%), and at follow-up, 10 (48%).

## DISCUSSION

This study was undertaken to investigate factors involved in the maintenance of weight loss and to assess the effectiveness of a maintenance intervention program for successful dieters at risk of relapse. The objective of the intervention was to increase the likelihood of weight loss maintenance by raising participants' levels of self-efficacy in eating situations and increasing the relative use of problem-focused coping in response to negative affect associated with overeating. The results indicate that this type of maintenance intervention treatment, with or without a relapse prevention component, does not appear to have the desired effect.

Because this intervention program took a different approach to the problem of maintenance failures, it is difficult to compare the findings with those of other studies. The traditional format of maintenance interventions has been booster sessions designed to reinforce the use of behavioral strategies and offered as a continuation of treatment. In the present study, the intervention was not a follow-up of a previous treatment group but a separate program entirely. Participants who had regained some or even most of the weight they had lost were not seen as treatment failures but as once-successful people who understood what they needed to do for weight management but were having difficulty doing it. The focus of the program was on increasing their levels of self-efficacy and

enhancing their relative use of problem-focused coping by treating them as capable people who faced a significant challenge that they could best meet by gaining a better understanding of the problem and of themselves.

It was hypothesized that from pretest to posttest, participants in both treatment conditions, with or without a relapse prevention component, would show increased levels of self-efficacy and relative use of problem-focused coping when compared with the control group. It was further hypothesized that these increases would be maintained from posttest to a 6-week follow-up for the treatment group with the relapse prevention component, but not for the other treatment condition. These hypotheses were not supported by the results. A final hypothesis, that there would be a significant correlation between percentage of problem-focused coping at posttest and self-efficacy at follow-up, was supported. In addition, in an exploratory fashion, several correlations were examined between variables and dependent measures and successful weight loss maintenance.

#### Dependent Measures and Hypothesized Results

Although changes among groups over time on the dependent measures were non-significant, an examination of the mean scores for the dependent measures indicates a tendency towards change in the expected direction (see Table 2). From pretest to follow-up, the self-efficacy mean scores of the initial treatment groups showed decreases (lower scores = higher self-efficacy) whereas that of the

control group did not. Similarly, relative use of problem-focused coping increased for all groups.

The change in pretest to posttest scores for the MI and WL groups requires some attempt at explanation. One possibility for improved self-efficacy in the WL group may be that merely attending a preliminary session gave some individuals a sense of perceived control. Two WL participants wrote unsolicited comments on their posttest questionnaires to the effect that they had experienced less difficulty controlling overeating since the session, even though no treatment had been given. Another possibility is that filling in the questionnaires gave some participants insight into what was leading to their overeating problems and they began to address those issues. By follow-up, however, these influences had faded.

The small increase in the mean self-efficacy score (lower scores = higher self-efficacy) in the MI group is less explainable. An examination of the individual scores in this group reveals that of the 4 participants whose scores increased at posttest, 2 of the increases were unusually large, 26 and 51 points, and perhaps this outweighed any improvements and resulted in the higher mean score.

The failure of the relapse prevention component to have the hypothesized effect of producing more lasting changes in the RP groups was likely due to a combination of factors. By chance, both the RPI and RPI2 groups had substantially

lower self-efficacy and used relatively less problem-focused coping than the MI and MI2 groups. Low self-efficacy may have kept participants in the RPI groups from using the information they received about the relapse process to develop a plan for relapse prevention. Additionally, it became apparent that 4 1-hour sessions, mostly spent on other issues, were inadequate for the task of giving much more than an overview of relapse prevention. In other words, the relapse prevention component received short shrift and the results of the study should not be interpreted as a failure of relapse prevention training to enhance maintenance success. In discussing their own study, Perri et al. (1984) suggested that even 6 sessions may not have been enough for relapse prevention training.

Self-efficacy scores. Several interpretations are possible for the lack of an increase in self-efficacy as the result of treatment. Although changes were in the expected direction as Table 2 indicates, they were relatively small. Only when the initial and second treatment groups were combined into MI-C and RPI-C did the results approach significance. The Eating Self-efficacy Scale (Glynn & Ruderman, 1984) which was used to measure self-efficacy in eating situations, resulted in a great deal of variability among scores. In the normative sample of 217 young women who reported they were trying to lose weight, the range of

scores on the scale was from 33 to 148 (lower scores = higher self-efficacy) with an average score of 87.2 (SD = 25.08). In the present study, similar ranges and standard deviations were found. The large amount of variance in the scores would thus make significant changes unlikely unless the size of the change was large as well.

What is interesting, however, is the fact that the initial pretest average self-efficacy score for the 59 participants in this study was 108.6 (SD = 28.1), considerably higher than that of the normative sample. The average age of the normative sample was not reported, but participants were described as undergraduate students in an introductory psychology course, suggesting an average age of under 25 years. The average age of participants in the present study was 45.0 years (SD = 10.1). This raises the question of whether levels of self-efficacy in eating situations are likely to decrease with age, perhaps because of accumulated failures to control overeating.

Another possibility for the relatively small amount of change observed in average self-efficacy scores for the treatment groups is that the highly specific measure of self-efficacy in eating situations has a behavioral bias. An intervention focused on techniques specifically directed at avoiding overeating (e.g., delaying eating, changing behaviors linked to eating, like watching television, etc.), might have significantly increased this aspect of self-efficacy. However, this approach would not have addressed



the basic problem identified by Stalonas et al. (1984) which is that after treatment ends, successful dieters gradually abandon the strategies that they have been taught. In this study, it was assumed that women who had successfully maintained weight losses for at least 6 months knew what behavioral techniques worked for them; the challenge was to encourage them to use these strategies permanently. Thus the focus of the program was on developing the personal sense of responsibility and control in weight management that Colvin and Olson (1983) identified as an important characteristic of successful weight loss maintainers. This objective may have been too ambitious for a 4-week intervention program.

Problem-focused coping. Unlike many studies that have examined coping strategies in response to a variety of stressors (Folkman et al., 1986; Long & Haney, 1988), this study attempted to examine changes in coping over time in response to 1 identified stressor, the negative affect associated with overeating. Compas et al. (1988) had found moderate consistency in coping patterns in response to the same stressor, and the individual scores of participants in this study support this finding for the most part. A few individuals' scores fluctuated greatly, however. Six participants in the combined MI-C group and 4 in the RPI-C group had increases or decreases of 20% or more at different times of testing. This variability may have made group changes difficult to detect.

Failure to find significant posttreatment increases in the relative use of problem-focused coping led to an examination of an ancillary measure of attribution. Three questions were posed that related to the causality, changeability, and controllability of what participants felt was the major cause of their overeating. It was expected that during the course of treatment participants' appraisal of this major cause would shift from one related to personal deficiencies and thus likely to be permanent and less controllable, to a view that it was related to situations that were more controllable and temporary. In a study investigating coping strategies used in response to how a situation was appraised, researchers found that when the situation was seen as changeable, more confrontive coping, accepting responsibility, planful problem-solving, and positive reappraisal were used (Folkman et al., 1986). Thus it was expected that the relative use of problem-focused coping would be related to participants' appraisal of their situation, and that as this changed during the course of treatment, so would their relative coping change. Surprisingly, no correlation was found between any of the attribution scale items and the relative use of any type of coping.

An interesting finding is that the average score for percentage of problem-focused coping was fairly high for the MI groups at pretest and both MI and RPI groups at follow-up. In the Vitaliano et al. (1987) normative sample of

spouses of Alzheimer's disease patients, the average score was .26 (SD = .11), slightly lower than the average score for the MI group (M = .27, SD = .12). Of the three normative sample groups Vitaliano et al. used, the spouses of Alzheimer's disease patients showed higher relative use of problem-focused coping than either the psychiatric outpatients (M = .21, SD = .09) or medical students (M = .24, SD = .06). Although there is no established ceiling effect for relative use of this type of coping, it may have been unreasonable to expect the average score to increase very much for the MI group since it was at a high level to start with. The follow-up average scores for the MI (M = .29, SD = .11) and the RPI (M = .27, SD = .17) look very good compared to the normative sample's score. While the WL group improved, its score was still far below that of the normative group (M = .21, SD = .11), and there was no corresponding decrease in self-efficacy scores.

One possible conclusion is that in order to have high levels of self-efficacy, people wanting to maintain a weight loss have to use higher than average relative amounts of problem-focused coping to other types of coping. If this is true, it may be that the challenge of weight loss maintenance is one that demands a lifetime of extraordinary effort and may explain why so few people meet it. Another possibility for the relatively high problem-focused coping scores could be that the items in this subscale of the Vitaliano et al. (1985) revised WCCL were not specific

enough for individuals focusing on the specific stressor of negative affect related to overeating. The items on the subscale have a positive and optimistic quality that may have been attractive to participants even if they were not sure it related to their situation.

Problem-focused coping and self-efficacy relationship.

The final hypothesis for the study stated an expected relationship would be found between self-efficacy and percentage of problem-focused coping. The relapse prevention model (Marlatt & Gordon, 1980) indicates that when an adaptive coping strategy is used in a high-risk situation, self-efficacy is increased. Adaptive coping which results in mastery of the high-risk situation (e.g., not eating or overeating) is likely to be problem-focused, for example, using a behavioral strategy like moving away from the tempting food. Since it was expected that relative use of problem-focused coping would increase during treatment, levels at posttest were expected to be negatively correlated with self-efficacy scores at follow-up (lower scores = higher self-efficacy). This relationship was supported as a significant although low moderate correlation for the dependent measures at posttest and follow-up for the combined treatment groups, MI-C and RPI-C, was revealed ( $r = -.34$ ,  $p < .013$ ).

Although this relationship was expected, both from the relapse prevention model and from Bandura's (1977) assertion that being able to make a coping response that produces an

adaptive outcome contributes to a sense of personal efficacy, there has been little investigation of this association in weight loss studies. The present study indicates that in weight loss maintenance using relatively more problem-focused coping in a high-risk situation is associated with higher levels of self-efficacy in eating situations 6 weeks later.

#### Correlations Involving Self-Efficacy and Coping

When Pearson product-moment correlations were calculated for the combined treatment groups (MI-C and RPI-C) for associations between the two dependent measures of self-efficacy, coping, and their subscales, several interesting relationships were observed (see Table 4). These relationships must be interpreted with caution because they were not hypothesized and because a number of the correlates are not independent so an adjusted level of alpha is required.

Higher levels of self-efficacy were associated with higher relative use of problem-focused coping at pretest, posttest, and follow-up. When interrelations among the coping subscales were examined, it was found that only the strategy of seeking social support showed a positive relationship with problem-focused coping. Self-blame had a negative relationship with problem-focused coping, supporting what the relapse prevention model (Marlatt & Gordon, 1980) predicts, that the individual who attributes a lapse to internal personal deficits is more likely to

continue using the old behavior and less likely to get back on course.

### Correlations Involving Maintenance Strategies and Exercise

Correlational studies have identified associations between exercise and the use of specific maintenance strategies with successful maintenance (Colvin & Olson, 1983; Stalonas et al., 1984; Stuart & Guire, 1978). When Pearson product-moment correlations were calculated for all 59 participants in the study and pretest relationships between demographic and weight variables, maintenance strategies and exercise, and the dependent measures and their subscales, several interesting relationships were observed (see Table 5).

A positive correlation was found between age and relative use of self-blame ( $r = .25$ ), indicating that older participants were likely to use relatively higher amounts of this type of coping. Although the subscales used were different from those in this study, other researchers also found that older participants used relatively higher amounts of the subscale called Accept Responsibility (Folkman, Lazarus, Pimley, & Novacek, 1987). In the Folkman et al. study, younger participants were found to use relatively more Planful problem-solving and Seek social support coping responses. In the present study, relative use of problem-focused coping was not found to be associated with age, but a negative correlation was found between age and seeking

social support ( $r = -.28$ ), indicating that younger participants were more likely to use this strategy.

Weekly monitoring of weight was found to have an association with amount of weight regained by participants in this study. A negative correlation was found between monitoring and the amount of weight regained ( $r = -.36$ ). This supports the findings in correlational studies that regular weight monitoring is associated with successful maintenance. Since monitoring of weight is a strategy that is problem-focused, a significant correlation between it and relative use of problem-focused coping might be expected. None was found, but the relative use of another coping subscale, wishful thinking, was found to have a negative correlation with regular weight monitoring ( $r = -.24$ ). Perhaps when an individual feels unable to do anything about weight gain, wishful thinking allows some distancing from the problem. Distancing is one of the coping responses that was found associated with situations that were appraised as unchangeable in a coping study (Folkman et al., 1986).

A specific correlate of successful maintenance identified by Stuart and Guire (1978) was a quick reversal of small gains. In the present study, return to a more controlled eating program in response to weight gain was found to have a weak negative correlation with self-efficacy scores (lower scores = higher self-efficacy) and a weak positive correlation with relative use of problem-focused coping ( $r = -.22$ ; and  $r = .30$ , respectively). Additionally,

this maintenance strategy was found to have a weak negative correlation with the relative use of another type of coping response, that of avoidance ( $r = -.22$ ). What is not clear from this finding is whether there is a causal relationship between these factors, and if so, in which direction.

Exercise status (sedentary, moderately active, or active) was shown to have an association with the amount of weight regained. Higher levels of activity were found to have a negative correlation with amount regained ( $r = -.22$ ), and with percentage of weight regained ( $r = -.32$ ). This supports the finding of other studies that regular exercise may contribute to successful weight loss maintenance.

#### Clinical Significance

Although there were few statistically significant findings in this study, when clinical significance was assessed using Jacobson and Revenstorf's (1988) conservative formula, a pattern of improvement in the individuals in the treatment groups was observed. For self-efficacy, an examination of the number of participants in each treatment condition who improved, got worse, or stayed the same indicates that from pretest to posttest 36% of the MI-C group ( $n = 22$ ) and 28% of the RPI-C group ( $n = 21$ ) improved, with 5% and 10% respectively getting worse. From pretest to follow-up on percentage of problem-focused coping, 22% of the MI-C group improved, with 5% worsening, and 33% of the RPI-C group improved, with 10% getting worse.



On the basis of these figures, it would be fair to say that fewer than 4 out of 10 people benefitted from the program, and as many as 1 out of 10 were made worse. However, there were people in both groups who improved or got worse beyond the chance measure without reaching the change point, or who started at a point above or below the change point, depending on the measure, and improved or got worse without crossing the change score point. When these scores are included, 57% of the RPI-C group improved in self-efficacy and 57% in relative use of problem-focused coping, while the percentage of those who got worse for the second measure increased to 14%. A less noticeable increase was observed in percentages for the MI-C group with improved self-efficacy rising to 50% and those who got worse increasing to 14%. For problem-focused coping, the improved rate was 41% for the MI-C group and the percentage who got worse increased to 10%.

Another way of examining the scores is to see how many participants in each group were below the change point score for self-efficacy (lower scores = higher self-efficacy) or above the change point for problem-focused coping at each time of testing. In the MI-C group at pretest, there were 7 (32%) participants who had scores at or below the change point; at posttest, there were 11 (50%), and at follow-up, 14 (64%). In the RPI-C group there were 2 (10%) participants at or below the change score at pretest, 5 (24%) at posttest, and 7 (33%) at follow-up.

A similar pattern was demonstrated for percentage of problem-focused coping. In the MI-C group, almost half ( $n = 10$ , 45%) of the participants had scores at or above the change point at pretest. There were 12 (55%) participants at posttest, and 15 (68%) at follow-up who had scores at or above the change point. In the RPI-C group, at pretest, 7 (33%) participants were at or above the change point, at posttest, 7 (33%), and at follow-up, 10 (48%).

Although it is important that WL participants not be compared directly to the MI-C and RPI-C groups because some of the participants in those treatment groups were originally part of the WL, it is interesting to note that no such pattern of change was observed in WL participants. For self-efficacy, the numbers at or below the change point were 5 (29%) at pretest, 6 (35%) at posttest, and 3 (18%) at follow-up. For problem-focused coping, there were 5 (29%) participants at or above the change point at pretest, 6 (35%) at posttest, and 5 (29%) at follow-up.

Although any interpretation of this pattern must be done with caution, the possibility exists that treatment effects were not immediate but took longer to develop. A further follow-up assessment would have given a better indication of whether there were long-term benefits of the intervention.

### Anecdotal Evidence for Treatment Effectiveness

There was no attempt to record or quantify participants' comments and reports of successful change beyond the therapist's notation following sessions, but because certain issues were seen as important by every group, they are mentioned briefly here. The main comment made by participants was that the group discussions helped them to feel less alone and helpless in their struggles to maintain weight loss, and many expressed regret that this would end when the program did. The therapist encouraged interested participants to form support groups on their own following the intervention. Two such groups were started after the follow-up assessment, one from the initial groups and one from the second treatment groups and were continuing to meet when the therapist contacted the organizers several months later.

Participants offered different explanations for their difficulty in maintaining their losses, from too much interest in food, to relationship problems, to illness or change in activity level. What emerged as an issue that many found familiar, however, was a feeling of resentment and weariness about having to "work so hard" to keep the weight off. Related to this was a feeling that few people without a weight problem themselves understood the difficulty involved in maintaining a weight loss. The prevailing attitude of society seemed to be that the problem had been the extra pounds and once they were gone, the

person was "cured." Although many women reported receiving a great deal of support and recognition during weight loss, this had largely disappeared during maintenance.

Participants generally made little use of the Overeating Logs as a guide to understanding what led to overeating. Many said they "already knew" what the cause was, relating it to work or family stress, boredom, or some other negative feeling. They appeared to have a defeated attitude that there was little they could do to change the situation. Others who used the Logs after the first few sessions reported that they were having fewer problems and so had stopped recording.

The relapse prevention information was received with great interest by the RPI groups, who were immediately able to relate the process to their own experience. Only a few participants formulated a relapse prevention plan by the end of the intervention, however. Many appeared to have difficulty with the idea of breaking down the larger concept of "getting back on track" into the individual behaviors that were necessary to do that. A few claimed that they no longer needed a relapse prevention plan because they were now "back on track" as the result of the intervention. It was clear that presenting relapse prevention information in a condensed form was not really helpful to the participants.

Finally, what came across most strongly in all the groups was a sense of frustration and discouragement among those who had regained more than a few pounds. Their

commitment to being at a target weight was evident in their participation in the discussions and willingness to examine their issues, but many expressed uncertainty about being able to maintain, even if they managed to get back to their goals.

### Conclusion, Limitations, and Recommendations

This study involved a maintenance intervention that took an unconventional approach to the problem of maintenance difficulties. Instead of a focus on specific strategies for weight management, the program was presented to participants as one which might help them to take a step back from the problem and see what other issues might be getting in the way of their success. By treating participants in the intervention groups as successful dieters who had been able to maintain for at least six months and thus were capable of getting back to goal and staying there, the therapist/experimenter hoped to raise participants' levels of self-efficacy in eating situations and to increase their use of problem-focused coping. From a standpoint of statistical significance, the intervention produced no such result. From the standpoint of clinical significance, however, a case can be made for this type of intervention benefitting at least some women at risk of relapse.

Several limitations of the generalizability of the results of this study must be stated. The sample size was relatively small, resulting in small treatment groups.

Although data were collected for 59 participants at pretest, only 43 were tested both for pretest and follow-up. Thus, any findings must be cautiously interpreted. The women who participated in the study may not be highly representative of the general population of successful dieters at risk of relapse.

Any interpretation of the results with respect to the effectiveness of relapse prevention training would be misleading. The time limitations of the intervention allowed for such limited presentation of relapse prevention material that even if significant differences had been found between groups, it would be difficult to attribute them to the relapse prevention component. A true investigation of the effects of relapse prevention information and training on people having difficulty maintaining a weight loss remains to be done.

Based on the statistically nonsignificant findings of this study, further investigation of the type of intervention that was offered might appear unwarranted. The more conventional approach which tries to reinforce the use of behavioral techniques has also had limited success, however, otherwise the prospect of maintaining weight losses for more than a year would be brightening. The focus of this program on self-understanding and self-acceptance made it one that the participants almost unanimously described as being too short, both in session length and in duration of the program. It is recommended that future research on this

type of program takes this into account. A program lasting 8 to 12 weeks, with sessions 1 and a half to 2 hours long seems better suited to the objectives outlined.

A further recommendation for future research in this area is that other measures be developed or used which show less susceptibility to dramatic change. In one or two cases it was unclear whether an individual had really had such large increases in self-efficacy or had just misunderstood the scoring method at pretest. The Ways of Coping Checklist proved difficult to administer in a group setting. Some participants did not record what negative affect they had experienced and this made it unclear whether they understood the verbal instructions and those printed on the questionnaire. In other research this scale has been administered following a personal interview to establish that the stressor has been clearly identified (Folkman et al., 1987). To use it in a group format, it is recommended that the process of identifying the stressor be carefully done before the coping scale is used.

Maintaining a weight loss is a difficult goal, and one that few successful dieters achieve. Even those people who make significant lifestyle and food management changes in the process of weight loss face a formidable challenge for the rest of their lives. Recent studies on genetic predisposition to obesity (Bouchard et al., 1990; Stunkard et al., 1990) confirm what some overweight people have long suspected, that maintaining an ideal body weight is far more

difficult for some people than others. The focus in weight loss treatment programs on teaching "good" eating habits implies that ignorance and carelessness are responsible for weight problems, and promises lasting success once new habits are in place. Clearly it is not that simple.

What is needed is more research that carries on the work done on self-efficacy and coping in weight loss treatment and applies it to weight loss maintenance treatments. Better measurements of self-efficacy and coping must be developed that are more specific to the problems faced by people trying to maintain a weight loss. This will enable researchers to learn more about what happens when successful dieters begin to relapse and eventually develop treatments that can reverse the process. Exploratory research is necessary because the problem is one for which no solution has yet been found. The more that is learned about this group of individuals, even in the course of interventions that have little effect, the sooner the process of relapse can be understood and ultimately reversed.



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## Appendix A

Demographic Profile

Informed Consent Form

Attribution Scale

CODE \_\_\_\_\_

## DEMOGRAPHIC QUESTIONNAIRE

Please answer all the following questions as they are important for research purposes. Your name will not be associated with any of this information and it will be kept strictly confidential.

Marital status: Married/commonlaw relationship \_\_\_\_\_  
 Single \_\_\_\_\_ Divorced/separated \_\_\_\_\_ Widowed \_\_\_\_\_

Employment status: Employed full-time \_\_\_\_\_  
 (for any employer or self-employed)

Part-time \_\_\_\_\_ Retired: \_\_\_\_\_ Student \_\_\_\_\_

Age: \_\_\_\_\_ (years) Height: \_\_\_\_\_ (inches)

Weight: \_\_\_\_\_ (lbs.) Target weight: \_\_\_\_\_ (lbs.)

How much weight did you lose, from highest weight to target weight (or below)?

Weight loss \_\_\_\_\_ (lbs.)

How long ago did you reach your goal? \_\_\_\_\_ (months)

How long did you maintain your target weight with no more than a five pound gain?

\_\_\_\_\_ (months)

## EXERCISE

Would you rate yourself as: (please check one)

Sedentary _____	Moderately Active _____	Active _____
(no exercise beyond daily routine)	(occasional walks, moderate exertion)	(regular planned exercise that raises a sweat)

Has this changed since you first reached your target weight? In what way has it changed?

\_\_\_\_\_  
 \_\_\_\_\_

If you checked Moderately Active, or Active, please list which activities you do weekly.

How many times weekly? \_\_\_\_\_

How long does a session last? \_\_\_\_\_ (minutes)

#### MAINTENANCE

Which (if any) of the following maintenance techniques do you use? Please circle the number using this scale to indicate how much or how little you use each one:

0	1	2	3	4
not used	seldom used	sometimes used	often used	always used

1. Keeping track of food amounts or calories?

0                      1                      2                      3                      4

2. Weighing yourself once a week?

0                      1                      2                      3                      4

(Do you weigh in more often? How often? \_\_\_\_\_ (times weekly))

3. Controlling amounts of food by weighing or measuring (ex., half a cup of skim milk, 4 oz. of fish, etc.)

0                      1                      2                      3                      4

4. Putting yourself on a more structured eating and/or exercise plan after gaining a specified number of pounds?

0                      1                      2                      3                      4

(What is your specified number of pounds? \_\_\_\_\_)



# ATTRIBUTION SCALE

When you consider most of the occasions in which you have eaten more than you should if you want to maintain your weight loss, what do you feel was the major cause? Write it down in the space provided if you wish.

Major Cause: \_\_\_\_\_

Think about this major cause, then look at the items below. Please circle the number which is closest to your opinion for each of the following scales.

1. Is the major cause something that:

Reflects an  
aspect of  
yourself

Reflects an  
aspect of the  
situation

1        2        3        4        5        6        7        8        9

2. Is the major cause:

Controllable  
by you or  
other people

Uncontrollable  
by you or  
other people

1        2        3        4        5        6        7        8        9

3. Is the major cause something that is:

Permanent

Temporary

1        2        3        4        5        6        7        8        9

## APPENDIX B

The Eating Self-Efficacy Scale (ESES)

The Ways of Coping Checklist (WCCL)

# Eating Self-Efficacy Scale

For each of the situations below, please rate the likelihood you would have difficulty controlling your eating, using this scale:

1	2	3	4	5	6	7
No Difficulty			Moderate Difficulty Controlling Overeating			Most Difficulty

For example, if you think you have great difficulty controlling overeating when you are at a party, you might complete an item specifying parties this way:

Overeating at parties	1	2	3	4	5	(6)	7
-----------------------	---	---	---	---	---	-----	---

Please complete every item.

How difficult is it to control your ....

- |  |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|
| 1. Overeating after work or school?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Overeating when you feel restless?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Overeating around holiday time?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Overeating when you feel upset?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Overeating when tense?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Overeating with friends?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Overeating when preparing food?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Overeating when irritable?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Overeating as part of a social<br>occasion dealing with food<br>-- like at a restaurant or<br>dinner party? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Overeating with family members?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Overeating when annoyed?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Overeating when angry?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1	2	3	4	5	6	7
No Difficulty	Moderate Difficulty Controlling Overeating					Most Difficulty

How difficult is it for you to control your ...

- |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| 13. Overeating when you are angry<br>at yourself?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. Overeating when depressed?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Overeating when you feel<br>impatient?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Overeating when you want to<br>sit back and enjoy some food?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Overeating after an argument?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Overeating when you feel<br>frustrated?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Overeating when tempting food is<br>in front of you?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Overeating when you want to cheer<br>up?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Overeating when there is a lot of<br>food available to you?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. Overeating when you feel overly<br>sensitive?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. Overeating when nervous?  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. Overeating when hungry?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. Overeating when anxious or worried?   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. Overeating when _____<br>(fill in your own situation if you<br>feel it is missing from list above). | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## WAYS OF COPING CHECKLIST

Please take a few minutes to think about a recent time (within the past week or two if possible) when you ate more than you knew was consistent with maintaining your goal weight and felt upset about it. Briefly describe the situation in the space below, paying attention to the circumstances, including what led up to it, and just how you felt after overeating.

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---

Now, please read each item below and indicate, by circling the appropriate category, to what extent you used it in the situation you have selected.

	Not used	Used some- what	Used quite a bit	Used a great deal
1. Changed something so things would turn out all right.	0	1	2	3
2. Thought about fantastic or unreal things (like perfect revenge or finding a million dollars) that made me feel better.	0	1	2	3
3. Talked to someone to find out about the situation.	0	1	2	3
4. Changed or grew as a person in a good way.	0	1	2	3
5. Tried not to act too hastily or follow my own hunch.	0	1	2	3
6. Bargained or compromised to get something positive from the situation.	0	1	2	3
7. I knew what had to be done, so I doubled my efforts and tried harder to make things work.	0	1	2	3

8. Felt bad that I couldn't avoid the problem.	0	1	2	3
9. Refused to believe it had happened.	0	1	2	3
10. Made a plan of action -- and followed it.	0	1	2	3
11. Tried to forget the whole thing.	0	1	2	3
12. Tried to make myself feel better by eating, drinking, smoking, taking medications.	0	1	2	3
13. Accepted sympathy and understanding from someone.	0	1	2	3
14. Tried not to burn my bridges behind me, but left things open somewhat.	0	1	2	3
15. Slept more than usual.	0	1	2	3
16. Daydreamed or imagined a better time or place than the one I was in.	0	1	2	3
17. Talked to someone who could do something about the problem.	0	1	2	3
18. Concentrated on something good that could come out of the whole thing.	0	1	2	3
19. Talked to someone about how I was feeling.	0	1	2	3
20. Came up with a couple of different solutions to the problem.	0	1	2	3
21. Wished that I could change what had happened.	0	1	2	3

22. Went on as if nothing had happened.	0	1	2	3
23. Wished that I could change the way I felt.	0	1	2	3
24. Stood my ground and fought for what I wanted.	0	1	2	3
25. Changed something about myself so I could deal with the situation better.	0	1	2	3
26. Wished I was a stronger person -- more optimistic and forceful.	0	1	2	3
27. Got mad at the people or things that caused the problem.	0	1	2	3
28. Realized I brought the problem on myself.	0	1	2	3
29. Wished the situation would go away or somehow be finished.	0	1	2	3
30. Just took things one step at a time.	0	1	2	3
31. Got professional help and did what was recommended.	0	1	2	3
32. Hoped a miracle would happen.	0	1	2	3
33. Asked someone I respected for advice and followed it.	0	1	2	3
34. Avoided being with people in general.	0	1	2	3
35. Came out of the experience better than when I went in.	0	1	2	3
36. Kept others from knowing how bad things were.	0	1	2	3
37. Had fantasies or wishes about how things might turn out.	0	1	2	3
38. Blamed myself.	0	1	2	3

39. Accepted the strong feelings, but didn't let them interfere with other things too much.	0	1	2	3
40. Kept my feelings to myself.	0	1	2	3
41. Criticized or lectured myself.	0	1	2	3
42. Accepted the next best thing to what I wanted.	0	1	2	3



### Reliability and validity for the WCCL

Because coping is conceptualized as a process that changes over time, test-retest reliability of the WCCL is difficult to measure. Internal consistency of the scale has been demonstrated by Folkman and Lazarus (1980). First, project members showed 91% agreement in classifying items on the scale as either problem-focused or emotion-focused coping. In a study in which three vignettes describing stressful situations were presented to undergraduate students, items on the scale were classified as problem-focused or emotion-focused coping, with 78% of the items identified as serving the same function specified by project members. In an independent sample, the mean alpha (Cronbach, 1951) across two administrations was .80 for the problem-focused subscale and .81 for the emotion-focused subscale. Only modest correlations between the problem-focused and emotion-focused subscales were found.

Construct and concurrent validity have been demonstrated in a series of studies, some of which are reported here. Folkman and Lazarus (1980) found that both problem- and emotion-focused coping were used in 98% of the stressful encounters of a sample of 100 middle-aged community residents whose self-reported stressful events were studied over the course of a year, and who completed the WCCL at regular intervals. This result was replicated

in a later study of the strategies used by college students to cope with a single stressful event, an exam (Folkman & Lazarus, 1985).

Several studies have investigated the relationship between coping and theoretically relevant personality characteristics. Heppner, Reeder, and Larson (1983) studied the relationship between problem-solving skill and coping, finding that their 26 self-ascribed effective problem solvers used more problem-focused means of coping and were less likely to blame themselves than an equal number of self-ascribed poor problem solvers. Parkes (1984) looked at the relationship between coping and locus of control in a sample of 171 student nurses, finding that students with an internal control orientation seemed better able to assess the specific demands of a situation and thus to select more appropriate coping strategies.

## APPENDIX C

Expectancy Scale

Participant Session Evaluation

## Expectancy Scale

Please indicate your response to each question by circling the number at the point which is closest to your feelings.

1. How confident are you that this program will be successful in improving your long-term ability to maintain your weight loss?

0	1	2	3	4	5	6
Not at all		Somewhat			Very much so	

2. How logical does this program seem to you as one that could increase the likelihood of weight loss maintenance?

0	1	2	3	4	5	6
Not at all		Somewhat			Very much so	

3. How confident would you be in recommending this program to a friend who was having trouble with weight loss maintenance?

0	1	2	3	4	5	6
Not at all		Somewhat			Very much so	

## Session Evaluation

1. How productive or useful was today's session for you?
  1. very low
  2. low
  3. moderate
  4. high
  5. very high
  
2. How important to you were the problems or situations discussed in the group today?
  1. not at all important; irrelevant
  2. somewhat unimportant
  3. neither important nor unimportant
  4. somewhat important
  5. very important
  
3. How would you describe the information that is being presented?
  1. something you already know and are not interested in hearing more about
  2. something you already know but are willing to hear more about
  3. something you didn't know and are willing to hear about
  4. something you didn't know but are not interested in hearing about
  
4. How comfortable are you with the way the information is being presented (i.e., group discussions, short presentations)?
  1. very uncomfortable
  2. somewhat uncomfortable
  3. neither uncomfortable or comfortable; neutral
  4. somewhat comfortable
  5. very comfortable
  
5. If you wish to add any comments, please feel free to do so in the space below or on the other side of the page.

## APPENDIX D

### Multivariate and Univariate Analyses for Dependent Measures

Multivariate and Univariate Analyses for  
Self-Efficacy and Percentage of Problem-Focused Coping

Initial Groups (MI, RPI, WL)

	<u>F</u>	<u>p</u>	<u>df</u>
Multivariate Group Effect	1.95	.11	4,78
Univariates Self-Efficacy	2.72	.08	2,40
% P-F Coping	2.55	.09	2,40
<hr/>			
Multivariate Time Effect			
Pretest to Posttest	<1	.51	2,39
Univariates Self-Efficacy	<1	.49	1,40
% P-F Coping	<1	.38	1,40
<hr/>			
Multivariate Time Effect			
Posttest to Follow-up	1.17	.32	2,39
Univariates Self-Efficacy	<1	.63	1,40
% P-F Coping	2.27	.14	1,40
<hr/>			
Multivariate Group x Time Effect			
Pretest to Posttest	<1	.87	4,78
Univariates Self Efficacy	<1	.77	2,40
% P-F Coping	<1	.72	2,40
<hr/>			
Multivariate Group x Time Effect			
Posttest to Follow-up	<1	.45	4,78
Univariates Self-Efficacy	1.64	.21	2,40
% P-F Coping	<1	.73	2,40

Multivariate and Univariate Analyses for  
Self-Efficacy and Percentage of Problem-Focused Coping

Second Treatment Groups (MI2 and RPI2)

	<u>F</u>	<u>p</u>	<u>df</u>
Multivariate Group Effect	1.32	.30	2, 14
Univariates Self-Efficacy	1.98	.18	1, 15
% P-F Coping	2.44	.14	1, 15
<hr/>			
Multivariate Time Effect Pretest to Posttest	2.60	.11	2, 14
Univariates Self-Efficacy	4.66	.05	1, 15
% P-F Coping	1.87	.19	1, 15
<hr/>			
Multivariate Time Effect Posttest to Follow-up	<1	.40	2, 14
Univariates Self-Efficacy	2.12	.17	1, 15
% P-F Coping	<1	.68	1, 15
<hr/>			
Multivariate Group x Time Effect Pretest to Posttest	<1	.52	2, 14
Univariates Self Efficacy	1.48	.24	1, 15
% P-F Coping	<1	.82	1, 15
<hr/>			
Multivariate Group x Time Effect Posttest to Follow-up	<1	.73	2, 14
Univariates Self-Efficacy	<1	.43	1, 15
% P-F Coping	<1	.63	1, 15



Multivariate and Univariate Analyses for  
Self-Efficacy and Percentage of Problem-Focused Coping

Combined Treatment Groups (MI-C and RPI-C)

	<u>F</u>	<u>p</u>	<u>df</u>
Multivariate Group Effect	4.00	.026	2,40
Univariates Self-Efficacy	7.22	.01	1,41
% P-F Coping	4.23	.05	1,41
<hr/>			
Multivariate Time Effect Pretest to Posttest	2.62	.09	2,40
Univariates Self-Efficacy	3.95	.05	1,41
% P-F Coping	2.16	.15	1,41
<hr/>			
Multivariate Time Effect Posttest to Follow-up	2.64	.08	2,40
Univariates Self-Efficacy	4.76	.04	1,41
% P-F Coping	1.75	.19	1,41
<hr/>			
Multivariate Group x Time Effect Pretest to Posttest	1.17	.32	2,40
Univariates Self Efficacy	2.11	.15	1,41
% P-F Coping	<1	.46	1,41
<hr/>			
Multivariate Group x Time Effect Posttest to Follow-up	1.43	.25	2,40
Univariates Self-Efficacy	2.77	.10	1,41
% P-F Coping	<1	.98	1,41