Attitudes and weight reduction.

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ATTITUDES AND WEIGHT REDUCTION

A Dissertation Presented
by
Dorothy Sejwacz

Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August, 1977

Department of Psychology
ATTITUDES AND WEIGHT REDUCTION

A Dissertation Presented
by
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Although it is I who am getting the degree, there are many folks out there who made the process easier for me and now share in my sense of accomplishment. To all of you I would like to say THANKS.

Professor Icek Ajzen, who has been my academic advisor almost throughout my entire graduate school career, and has encouraged, guided, and supported me throughout;
Professor Arnie Well, who has taught me the ways of statistics;
Professor Fred Finch, who never lost confidence in me;
Professor Mort Harmatz, who guided me through the area of weight reduction;
Burt, fellow traveler through the program and dear friend who helped in the area that I was weakest in;
My parents, who have always given me unconditional support and often nudged me on, can now feel "naches";
Rachel, whose quiet support was so much appreciated; and
Rich, who allowed me to share with him my most difficult moments, can finally share my joy.
All of you folks — thank you.
ABSTRACT

Attitudes and Weight Reduction
(August, 1977)

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Previous research in weight reduction has demonstrated the ineffectiveness of verbal measures, ranging from personality tests to measures of attitudes, in predicting individual differences in weight reduction. It was suggested that one reason for the lack of success of attitudinal measures in predicting individual differences might be the inappropriateness of the traditionally used attitudinal concepts. The present study attempted to demonstrate that individual differences in weight reduction could be predicted when using the Fishbein-Ajzen approach of predicting behaviors from behavioral intentions.

According to the Fishbein-Ajzen model, behavior is directly a function of corresponding behavioral intentions which in turn are a function of attitudes and subjective norms. The model has been shown to be successful in the prediction of various other specific behaviors although not in the area of weight control.

In the present study it was hypothesized that weight reduction is the result of a series of specific dietary behaviors and physical activities. Given that the Fishbein-Ajzen model could be used to predict these specific behaviors, weight reduction could in turn be
predicted.

Ninety-four female undergraduates from the University of Massachusetts participated as subjects. Although overweight females were encouraged to participate, normal weight women were also included in the study. At the start of the experiment (Time 1) all subjects were weighed; the mean percent overweight was 10.28. Two months hence (Time 3) all subjects were again weighed in order to obtain measures of weight reduction. Subjects' intentions, attitudes, and subjective norms with respect to performing 12 specific dietary behaviors and physical activities hypothesized to be positively related to weight reduction were obtained through questionnaires completed at Times 1 and 3. At Time 3, subjects reported the extent to which they performed these behaviors during the previous two months. In addition, half of the subjects were asked to complete questionnaires at Time 2 (one month following the start of the experiment) again indicating their intentions, attitudes, subjective norms as well as their behavior during the preceding month. Half of these subjects and half of the subjects not completing questionnaires at Time 2 were asked to complete weekly self-report questionnaires of their behavior throughout the two-month period.

Results supported the applicability of the Fishbein-Ajzen model in predicting behaviors from intentions. As hypothesized, the correlations between measures of intentions and corresponding self-report measures of behavior tended to be positive, statistically significant and relatively high. This was found across all behaviors, across both self-report measures (weekly and retrospective) and over one and two-month duration. Furthermore, results supported the relationship between
intentions, attitudes, and subjective norms as proposed by the model. As predicted, multiple regression analyses computed on the above three variables, revealed relatively high and statistically significant multiple R's. These results were obtained across all behaviors and at each of the three time periods.

While the present study provided additional support for the Fishbein-Ajzen model in predicting behavior, the relationship between the behaviors used in this study and weight reduction was less clear-cut. Despite the fact that correlations between the behaviors and weight reduction were positive and statistically significant, they were relatively low. Several explanations were suggested for these findings.

In sum, the present study provided additional support for the Fishbein-Ajzen model; suggested practical implications for the use of the model in formal weight reduction programs; suggested that weight loss is more complex than simply the result of a series of behaviors; and indicated that the model might be applied to predict consequences of behavior.
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INTRODUCTION

Stuart and Davis (1971) noted that "...it is estimated that there are some 40 to 80 million obese Americans, depending upon the criteria used." Wyden (1965) reported that a poll conducted by the Alfred Politz Research Company in 1964 estimated that:

...some 9.5 million said that they were on diets, another 16.5 million reported that they were watching their weight so they wouldn't gain, and still another 26.1 million expressed some concern about their waistlines. It was reasonable to conclude, therefore, that the ranks of the calorie-conscious added to fifty-two million eaters. (p.1)

Obviously the problem of obesity is widespread and of great concern to almost one quarter of the population. As a result of the overwhelming concern, various treatment techniques have been proposed by laymen as well as by professionals to deal with obesity; yet, most have produced only mediocre results (Stunkard & McLaren-Hume, 1959). Although recently, results of numerous behavior-modification weight-reduction studies have clearly demonstrated that obesity can be controlled, great individual differences have been obtained with some patients even gaining weight (Jeffrey, 1974). Clearly, the next step would be to identify a priori those individuals for whom a particular weight-reduction treatment is likely to prove unsuccessful. Yet. Hall and Hall (1974), after reviewing a number of studies investigating the efficacy of behavioral treatment of obesity, concluded that:

Prediction of individual differences in weight loss has not been at all successful. Clinical intuition, MMPI, MPI, weight prior to treatment, general anxiety, situation specific anxiety, PAS, EPQ, I-E Scale, body image measures, attitudinal measures, and the 16 PF questionnaire have all failed to predict success in treatment. (p. 362)
One purpose of the present study is to demonstrate that individual differences in weight-reduction can be predicted from measures of the individual's attitudes and intentions. However, prior to describing the particular model to be used, another study will be reviewed in order to demonstrate why the traditionally used attitudinal concepts might be inappropriate for predicting individual differences in weight-reduction.

In addition to other factors, Leon and Chamberlain (1973) examined the relationship between weight maintenance and attitudes toward "eating", "the fat me", "the thin me", "the me right now", "my home", and "going to the movies". The subjects were placed in one of the following groups:

1. **Regainers** consisted of former members of a local weight-reduction club who had reached their goal one year previously and had regained more than 20% of the weight they had previously lost.

2. **Maintainers** consisted of individuals who had regained less than 20% of the amount they had initially lost.

3. **The control group** consisted of individuals who were either attending an evening school class or were employed as office workers.

Attitudes toward the six concepts, listed above, were measured by four semantic differential scales (pleasant-unpleasant, clean-dirty, beautiful-ugly, and good-bad). "Eating" was rated more positively on all four scales by regainers, as compared to maintainers. The maintainers' ratings of "eating" were lowest as compared to the other two groups on all four scales. However, the authors do not report whether any of the above differences were statistically significant. The ratings of the other five concepts, as a function of the group, were inconsistent.

In the above study it is unclear why attitudes toward the concepts
"my home" and "going to the movies" should at all be related to weight maintenance. Although intuitively it may appear as if attitudes toward the concepts "the fat me", "the thin me", and "me right now" might be related to actual weight maintenance, close examination reveals otherwise. In order for a person to maintain a low weight he/she must engage in certain behaviors and avoid other behaviors (eg. cut down on starchy foods, avoid being in places such as restaurants where might be tempted to eat starchy foods and/or eat too much). The perceived consequences of these behaviors may be "the thin me" along with some other consequences. However, although the individual may have a positive attitude toward "the thin me", he/she may not have positive attitudes toward some of the other perceived costs or consequences of those behaviors and thus, may not engage in them. For example, the person may like eating in restaurants because he/she enjoys being with friends and may have a more positive attitude toward being with friends than toward "the thin me". In other words, no systematic relationship would be expected between attitudes toward one consequence of a behavior and performance of the behavior unless the actor perceived that the behavior had only that one consequence. Thus, it is not surprising that no clear-cut relationship was obtained between attitudes toward the five concepts and weight maintenance.

The concept "eating" differs from the other five in that it is a behavior. For weight maintenance a person probably must engage in a specific form of eating (eg. dieting) and his/her attitudes toward engaging in that particular form of eating might be expected to be related to weight maintenance. However, in the above study, attitudes toward
the general concept of "eating" (without specifying the particular type of eating or who is the person doing the eating) were obtained. Attitudes toward such a broad concept as "eating" cannot, in general, be expected to be related to one of the results (weight maintenance) of a very specific type of eating done by the individual.

Although the present study deals with weight reduction and not weight maintenance, the issues discussed above regarding the attitudinal concepts apply equally well. Some of the problems with these attitudinal concepts may be responsible for the lack of success of these measures in predicting individual differences in weight-reduction. The present study is an attempt to predict individual differences in weight-reduction by using a model for the prediction of behavioral intentions proposed by Fishbein (1967b). The above model has been shown to be successful in the prediction of various other specific behaviors (Ajzen & Fishbein, 1973) although not in the area of weight control.

Generally speaking, the theory is expressed in the form of a multiple regression equation in which two separate components are represented as influencing or determining a person's behavioral intentions and in turn, determining a person's behavior. The exact weight to be given to these two components within a given situation is determined by standard multiple-regression procedures.

In a given situation, a person is assumed to hold or to form a specific behavioral intention which influences his subsequent overt behavior. According to Fishbein and Ajzen (1975), there are two major factors that determine behavioral intentions: a personal or "attitudinal"
factor and a social or "normative" factor. These two components in the
type are given empirical weights. Symbolically, the central equation
of the theory can be presented as follows:

\[ B \sim I = (A_B)w_1 + (SN)w_2 \]  \hspace{1cm} (1)

In Equation 1, \( B \) is the behavior, \( I \) is the intention to perform behavior
\( B \); \( A_B \) is the attitude toward performing behavior \( B \); \( SN \) is the subjective
norm; and \( w_1 \) and \( w_2 \) are empirically determined weights.

Behavioral intentions are a function of the weighted sum of two
variables. The first, \( A_B \), is the actor's attitude toward performing the
behavior in question under a given set of circumstances. The second or
normative component of the theory, \( SN \), deals with the influence of the
social environment on behavior. The subjective norm is the person's
perception that most people who are important to him think he should or
should not perform the behavior in question.

The first component of the model, \( A_B \), or the actor's attitude toward
performing the behavior is proposed to be a function of the perceived
consequences of performing that behavior and of the person's evaluation
of those consequences. Thus,

\[ A_B = \sum_{i=1}^{n} b_i e_i \]  \hspace{1cm} (2)

where \( b_i \) is the belief that performing behavior \( B \) leads to consequence
or outcome \( i \); \( e_i \) is the person's evaluation of outcome \( i \); and \( n \) is the
number of beliefs the person holds about performing behavior \( B \). It has
been shown (Fishbein, 1963, 1967a; Rosenberg, 1956) that an individual's
attitude toward any object may be predicted from (or is highly correlated
with) his beliefs about the object and the evaluative aspects of those beliefs. In this case the attitude object is quite different from the type of attitude object that has usually been considered by most attitude researchers. That is, in the present analysis, we are concerned with an individual's beliefs about the performance of a given behavior, and thus the attitude being assessed is the individual's attitudes toward the performance of that behaviors, and not an attitude toward a given object, value, person, or situation.

Turning to the second component of the model, \( SN \), according to the theory, the general subjective norm is determined by the perceived expectations of specific referent individuals or groups, and by the person's motivation to comply with those expectations. Thus

\[
SN = \sum_{i=1}^{n} b_i m_i
\]

(3)

where \( b_i \) is the normative belief (i.e., the person's belief the reference group or individual \( i \) thinks he should or should not perform behavior \( B \)); \( m_i \) is the motivation to comply with referent \( i \); and \( n \) is the number of relevant referents. Of course, the potential reference groups or individuals whose expectations are being perceived to be relevant will vary with the behavioral situation. In some instances the expectations of a person's family or friends may be most relevant, but in others it may be the expectations of his supervisors or the society at large which are more influential. Frequently, the expectations of more than one reference group will have to be considered. Then, of course, it is also necessary to measure the individual's motivation to comply with each of the relevant reference groups.
According to Equation 3, the b x m products are computed for each relevant reference group and summed. This sum is viewed as equivalent to a "generalized normative belief," i.e., the subjective norm (SN).

The two major determinants, then, of behavioral intentions are the attitude toward the behavior and the subjective norm. As indicated in Equation 1, the attitudinal and normative components are given empirical weights in the prediction equation, proportional to their relative importance in the prediction of behavioral intentions. These empirical weights (w₁ and w₂) are expected to vary with the kind of behavior that is being predicted, with the conditions under which the behavior is to be performed, and with the person who is to perform the behavior. Ideally, the weights for the attitudinal and normative components would be available for each individual with respect to each behavior in a given situation. Since adequate estimates of this kind are not presently available, the practice has been to use multiple regression techniques, and standardized regression coefficients have served as estimates of the weights for the theory's components. The present version of the theory, then, is a multiple regression equation where there are two predictors, A₁ and SN, and the criterion is I, the behavioral intention under consideration.

Looking at Equation 1, it can be seen that any variable external to the model can influence behavioral intentions and behavior only indirectly by influencing either of the components or their relative weights. More specifically, demographic characteristics, situational variables, personality variables or "traditionally attitudinal variables"
(eg. toward objects, values, persons, institutions) should only be related to a specific behavior if: 1) that variables is correlated with the attitude toward performing the behavior and the attitudinal component carries a significant amount of weight in determining the intentions; and/or 2) that variable is correlated with the normative component and the normative component carries a significant amount of weight in determining the intention. That is, even though some external variable may be correlated with one of the two components, it will still be unrelated to behavioral intentions and behavior if that component carries little or no weight in determining behavioral intentions and thus behavior per se.

A number of investigations based on the model described above attempted to predict various intentions, including intentions to engage in premarital sexual intercourse (Fishbein, 1966), to perform 30 behaviors toward an African Negro (Carlson, 1968), to perform eight leisure-time activities (Ajzen & Fishbein, 1969), to send communications to coworkers and to follow the instructions of coworkers (Fishbein, Ajzen, Landy, & Anderson, 1970), to maintain missiles in an experimental game (Hornik, 1970), to cooperate or compete in a Prisoner's Dilemma Game (Ajzen & Fishbein, 1970; Ajzen, 1971), to cheat in college (DeVries & Ajzen, 1971), to sign two interracial photographic releases (Darroch, 1971), to perform four behaviors involving risk (Ajzen & Fishbein, 1972), to use birth control pills (Jaccard & Davidson, 1972), to sign up for an alcoholic treatment unit (McArdle, 1972), and to buy eight products (Glassman, 1971). The multiple correlations between $A_B$ and $SN$ and behavioral intentions in the above studies ranged from .57 and .87 with
the average correlation over all studies being .75. Thus, there is considerable support for the above theory for predicting behavioral intentions.

According to the above described model, behavioral intentions are the immediate determinants of the corresponding overt behavior. Several of the studies cited above also included a measure of overt behavior. In the two studies using the Prisoner's Dilemma Game (Ajzen & Fishbein, 1970; Ajzen, 1971), the number of times subjects chose the cooperative alternative was predicted from their intentions to choose that alternative. In the three games played, the correlations over all subjects were .84, .90, and .82. Hornik (1970) asked subjects in his two person war game how many missiles they intended to maintain to the end of the next trial, and he used this measure of intention to predict the number of missiles actually maintained. Correlations between intention and behavior were high. For example, the correlation between intentions measured after trial 25 and actual behavior on trial 26 was .87.

A high intention-behavior correlation was also obtained by McArdle (1972). Patients at a V.A. hospital who were diagnosed as having a drinking problem indicated whether they intended to sign up for the hospital's Alcoholic Treatment Unit (ATU) by placing a check mark on a seven-point likely-unlikely scale. This question was part of a long questionnaire. Immediately following administration of the questionnaire, the patients were given a sign-up sheet for admission to the ATU. Intentions to sign up and actual signing behavior were found to correlate .76.

The results of the studies presented above indicate that high cor-
relations can be obtained between appropriate measures of behavioral intentions and corresponding overt behavior. However, there are three major factors that influence the size of the relationship between intentions and behavior: 1) the correspondence between the measures of intentions and behavior; 2) the time between the measure of intentions and the behavioral observation; and 3) the degree to which carrying out the intentions is completely under the individual's control.

Perhaps the most important factor influencing the size of an intention-behavior relationship is the correspondence between the intention and behavior. According to a review of some of the relevant literature by Ajzen & Fishbein (in press), the lower the degree of correspondence between the attitudinal and behavioral entities, the lower the relationship obtained between the attitudinal measure and the behavioral measure. A similar argument can be made for the relationship between the size of the intention-behavior relationship and the correspondence between the two measures. Intentional and behavioral entities are viewed as consisting of four different elements: the action, the target at which the action is directed, the context in which the action is performed, and the time at which it is performed. A given action is always performed with respect to a given target, in a given context, and at a given point in time. An intentional predictor is said to correspond to the behavioral criterion to the extent that the intentional entity is identical in all four elements to the behavioral entity. For example, a measure of intentions "to diet to lose weight during the next two months" (a general action element and no context) corresponds directly only to a behavioral criterion based on the obser-
vation of different behaviors which are associated with "dieting to lose weight" in different contexts, during the next two months. On the other hand, when the intentions measure is more specific, for example, "not eating between meals during the next two months" (only the context is not specified), the behavioral criterion must also be more specific (i.e. the repeated observations of whether the person is or is not eating between meals during the next two months in different contexts). Note, however, that one's intentions to diet to lose weight over the next two months would not necessarily predict whether one ate between meals or not during that period of time since the intentions measured and the behavioral criterion do not correspond.

A second major factor influencing the size of the intention-behavior relationship is the time interval between the measure of intention and the behavioral observation. Generally speaking, the longer the time interval, the lower will be the correlation between the measure of intention and the measure of behavior. Clearly, the longer the time interval, the greater the probability that the individual may obtain new information or that certain events will occur that will lead the individual to change his intentions. Thus, the question of time has more to do with stability of the intention than with the nature of the relationship between intentions and behavior. If one wants to predict behavior at some future point in time, it will probably be necessary to take other factors into account (e.g. factors which could produce changes in the intention) as well as the intention per se.

Further breakdown of the intention-behavior relationship may occur
if performance of the behavior depends on certain abilities or resources that the actor does not possess or if it depends on the cooperation of other people. However, sometimes even behaviors that are apparently not under volitional control seem, nevertheless, to be related to intentions. In a study by Newton and Newton (1950), expectant mothers were classified as having positive, negative, or doubtful intentions to breast-feed their babies. After delivery, all mothers were told and encouraged to breast-feed. Milk supply on the fifth day following delivery was used to classify the mothers into three behavioral categories: successful (enough so that supplementary formulas were not necessary after fourth hospital day), unsuccessful (continued breast-feeding, but supplementary formulas were necessary after the fourth day), and abortive (ceased efforts to breast-feed). Computing a measure of association between intention and behavior resulted in a significant correlation coefficient of .48.

One purpose of the present study was to examine the applicability of the Fishbein-Ajzen approach to predict weight-reduction over a two-month period. Weight reduction differs conceptually from other behaviors discussed above in that it is the result or consequence of a series of behaviors rather than a behavior in and of itself. Most researchers in the area of obesity agree that "...virtually all obesities have in common an association between an excessive caloric intake and a deficient level of energy expenditure" (Stuart & Davis, 1973, p. 23). Thus, a decrease in caloric intake (i.e., some change in the quality and quantity of food intake) and/or an increase in energy expenditure (i.e., increase in physical activity) ought to
result in weight loss. In order to decrease caloric intake one must perform specific behaviors as well as avoid other behaviors (specific dietary behaviors) as is true of increasing one's energy expenditure (specific physical activities). The extent to which a person engages in these specific behaviors, both dietary behaviors and physical activities, will directly influence his/her weight reduction. The present study, using the Fishbein-Ajzen approach, attempted to predict the extent to which individuals will engage in these specific behaviors over a two-month period, and hence, predict their weight-reduction over that period of time. As discussed above, one major factor affecting the strength of the intentions-behavior relationship is the degree of correspondence between the two measures. In the present study, correlations were computed between corresponding as well as non-corresponding measures of intentions and behavior in order to examine whether in fact the latter would result in lower correlations.

Subjects consisted of overweight and normal weight female undergraduates at the University of Massachusetts. All subjects completed an extensive questionnaire at Time 1 and two months hence (Time 3), and were weighed at each of those points in time. In addition subjects were randomly assigned to one of the four conditions shown on the following page.

At Time 1, subjects' intentions and attitudes were measured toward entities varying in their level of generality. Generality is defined as the extent to which the attitudinal or intentional entities specify the action, the target at which the action is directed, the context in
which the action is performed, and time at which it is performed. The less the entity is specified in terms of action, target, context, and time, the more general it is said to be. In the present study, entities were considered at three levels of generality.

At the most general level, subjects' intentions, attitudes, and subjective norms, as proposed by the Fishbein-Ajzen model (see Equation 1) were measured toward "doing things to reduce weight during the next two months." This entity specifies a very general action element (i.e., behaviors that result in weight reduction), a two-month time period, no target, and no context.

At the next and less general level, subject's intentions, attitudes, and subjective norms, were measured toward: 1) the subject adhering to a diet to reduce weight during the next two months; and 2) the subject engaging in physical activity to reduce weight during the next two months. The above two entities are less general in that a narrower set of actions (dieting and physical activity as compared to doing things to
reduce weight) are specified, although the context and target elements are still unspecified.

At the third and least general level, the above two entities (dieting and physical activity) are further broken down into specific dietary behaviors and specific physical activities\(^1\), and subjects' intentions, attitudes, and subjective norms were obtained toward each of these behaviors. The entities at this level are more specific in that in addition to the time element (the next two months), the action element is further narrowed down, and to some extent, the context and target are specified (eg. avoiding snacking between meals and in the evenings, as compared to adhering to a diet to reduce weight).

In addition, attitudes toward the following traditionally used attitudinal concepts were measured: "eating", "the thin me", "the fat me", "going out on dates", and "the me right now".

The above measures constituted the items on the questionnaire at Time 1 (see Questionnaire 1 in Appendix). Summarizing the questionnaire included measures of: attitudes toward traditionally used concepts; and intentions, attitudes, and subjective norms toward doing things to reduce weight, dieting and physical activity, and toward specific dietary behaviors and specific physical activities.

\(^1\)A set of the specific dietary behaviors and specific physical activities was obtained from a pre-test on a sample of female undergraduates at the University of Massachusetts. Subjects listed the behaviors that they would engage in and those they would avoid if they were to diet and engage in physical activity to reduce weight during the next three months. Based on the subjects' responses, two sets of behaviors were composed, one for dieting and one for physical activity, which were used in the present study.
At Times 2 and 3, the questionnaires included all the measures obtained at Time 1, as well as some additional measures. To correspond to the intentional entities, retrospective self-report measures were obtained of the extent to which subjects adhered to a diet to reduce weight, performed physical activity to reduce weight, and performed the specific dietary behaviors and the specific physical activities. One-half of the subjects were asked to return at Time 2 so that measures of intentions and behavior would also be available half-way through the experiment.

The weekly questionnaires (see Questionnaire 3 in Appendix) included only self-report measures of the extent to which subjects engaged in each of the specific dietary behaviors and physical activities. One-half of the subjects were asked to complete these measures so that in addition to retrospective self-reports at Times 2 and 3, weekly self-reports would be available.

The following relationships were hypothesized:

1. Given the assumption that the performance of the behaviors selected in the present study were related to weight reduction, a positive relationship was expected between subjects' self-report measures of behavior and weight-reduction during the two-month period.

2. According to the Fishbein-Ajzen model, it was predicted that there would be high positive correlations between measures of behavioral intentions and corresponding self-report measures of behavior. High positive correlations were not expected between noncorresponding measures of intention and behavior.
According to the Fishbein-Ajzen model, behavioral intentions are a function of attitudes and subjective norms toward the behavior in question. It was predicted that multiple regression analyses (computed separately for each behavior) between intentions (dependent variable) and attitudes and subjective norms (independent variables) would result in high multiple R's. No predictions were made as to the relative contribution of attitudes versus subjective norms in predicting behavioral intentions.

**METHOD**

**Subjects**

Ninety-four female undergraduates enrolled in psychology courses at the University of Massachusetts participated for course credit as subjects in the present study. Although women who considered themselves to be overweight were encouraged to participate in the study, women of normal weight who wished to participate were also included.

**Procedure**

At Time 1, 94 subjects completed a questionnaire (see Questionnaire 1 in Appendix) assessing their diet and weight history, attitudes, intentions, and subjective norms toward various weight-related concepts and behaviors. Also, at this time, subjects completed a version of the I-E scale (Collins, 1974) (see Questionnaire 2 in Appendix). All subjects were weighed by the experimenter at Time 1.

Two months hence (Time 3), 88 subjects (six subjects failed to return at Time 3) completed another questionnaire which included all
the measures on Questionnaire 1 (with the exception of the diet and weight history measures), as well as some self-report measures of their behavior over the two-month period. All subjects present at Time 3 were again weighed by the experimenter.

Forty-nine subjects were randomly selected at Time 1 and asked to complete weekly questionnaires (see Questionnaire 3 in Appendix) consisting of self-report measures of specific behaviors during each week over the two-month period. The remaining 45 subjects were not asked to complete weekly questionnaires. Of the 49 subjects asked to complete weekly questionnaires, two did not report at Time 3 and two failed to complete the weekly questionnaires although they did report at Time 3. The latter two subjects were assigned to the no-weekly-questionnaires condition. Of the 45 subjects not asked to complete weekly questionnaires, four failed to report at Time 3.

In addition, 47 subjects selected randomly (25 in the weekly-questionnaires condition and 22 in the no-weekly-questionnaire condition) were asked to return one month following the completion of Questionnaire 1 (Time 2) to be weighed again and to complete an additional questionnaire. The questionnaires at Time 2 were identical to the ones at Time 3. However, the self-report measures dealt with the subjects' behaviors over the preceding one-month period. Of these 47 subjects, one subject failed to report at Time 2 due to illness but did report at Time 3. She was assigned to the no monthly questionnaires condition. Of the remaining 46 subjects, two failed to report at Time 3. Forty-seven subjects (24 in the weekly-questionnaires
condition and 23 in the no-weekly-questionnaires condition) were not asked to return at Time 2. Of these, four subjects failed to report at Time 3. Taking into account only subjects who reported at Time 3, the number of subjects in each of the four conditions were as follows (see Table 1): 24 subjects in the weekly- and monthly-questionnaires condition, 21 subjects in the weekly- and no-monthly questionnaires condition, 20 subjects in the monthly- and no-weekly-questionnaires condition, and 23 subjects in the no-weekly- and no-monthly questionnaires condition.

**Questionnaires**

*Diet and weight history and general attitudes.* The first part of Questionnaire 1 (questions 1 through 5) contained questions pertaining to the subject's diet and weight history. These questions were scored as indicated on Questionnaire 1 in Appendix and an index of diet and weight history was obtained for each subject as proposed by Herman and Polivy (1975). In addition, subjects were asked to indicate their age, height, and ease/difficulty of losing weight on a 7-point scale ranging from "easy" to "difficult". The above measures were obtained from all subjects at Time 1 only.

Subjects' attitudes toward the concepts of "eating", "the thin me", "the fat me", "going out on dates", and "the me right now", (see Questionnaire 1, questions 49 through 53) were measured at all three time periods.

*Attitudes, subjective norms, and intentions.* Subject's intentions, attitudes, and subjective norms toward each of the behaviors listed below were measured at Times 1, 2, and 3. Following is a list of the
<table>
<thead>
<tr>
<th>Weekly Questionnaire</th>
<th>Yes</th>
<th>No</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>24</td>
<td>21</td>
<td>45</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>23</td>
<td>43</td>
</tr>
<tr>
<td>TOTAL</td>
<td>44</td>
<td>44</td>
<td>88</td>
</tr>
</tbody>
</table>

*Only subjects who reported at Time 3 are included.*
behaviors divided according to the level of specificity of the behaviors:

I  at the most general level
   (i) reduce weight (Questionnaire 1, questions 46, 11, and 40)
   (ii) really do things to reduce weight (Questionnaire 1, questions 3, 19, and 32)

II at an intermediate level of generality
   (i) adhere to a diet to reduce weight (Questionnaire 1, questions 47, 9, and 1)
   (ii) engage in physical activity to reduce weight (Questionnaire 1, questions 48, 10, and 2)

III at the most specific level
   (i) specific dietary behavior (Questionnaire 1, questions 25 through 31, 12 through 18, and 33 through 39)
       1. avoid snacking between meals and in the evenings
       2. cut down on all starchy foods (eg., sweets, bread, potatoes)
       3. avoid being in places where might be tempted to eat starchy foods and/or eat too much (eg. restaurants, bakeries, coffee-shops)
       4. decrease food intake in general by eating lighter meals, not having seconds, and not overeating
5. maintain a balanced diet by eating all the essential nutrients
6. eating on a consistent and regular schedule
7. keep to a minimum drinking of any alcoholic beverages

(ii) specific physical activities (Questionnaire 1, questions 4 through 8, 41 through 45, and 20 through 24)
1. avoid long periods of inactivity (eg. watching TV, just sitting around)
2. avoid excessive sleeping or napping during the day time (especially after meals)
3. walk wherever possible instead of riding the bus, driving a car, or riding an elevator
4. do exercises such as jogging, calisthenics, etc. on a regular basis
5. participate in sports on a regular basis (eg. swimming, skiing, tennis, skating, bike riding, basketball)

Intentions to perform each of the behaviors were measured on a single 7-point scale, such as:

I intend to (perform Behavior X) for the next two months
likely _____:_____:_____:_____:_____:_____: unlikely

Attitudes toward all the concepts and behaviors listed above were each measured on four 7-point semantic differential scales (good-bad, beneficial-harmful, pleasant-unpleasant, and wise-foolish). A subjects'
attitude toward each concept or behavior was computed by summing the scores on the above four scales for each of the behaviors. Also, subjects were asked to rate each concept and behavior on three additional (filler items) 7-point semantic differential scales (convenient-inconvenient, comfortable-uncomfortable, and easy-difficult).

Subjective norms toward each of the behaviors were measured on a single 7-point scale, such as:

Most people who are important to me think
I should ___:___:___:___:___: ___: I should not
(perform Behavior X) during the next two months

All items on Questionnaire 1 (with the exception of the diet and weight history items) were divided into blocks of items and the blocks of items were arranged in two random orders resulting in two versions of the questionnaire. Half of the subjects completed Version 1, and the other half completed Version 2 of Questionnaire 1 at Time 1. On subsequent occasions, subjects completed a different version of the questionnaire than they had previously. This was done in order to counterbalance for order effects.

A multiple regression analysis was computed for each of the behaviors with intentions as the dependent variable and attitudes and subjective norms the independent variables as proposed by the Fishbein-Ajzen approach. Further, in order to obtain an overall measure of the extent to which intentions are related to attitudes and subjective norms, a multiple regression analysis was performed on the sum of intentions toward the specific behaviors (both dietary behaviors and physical activities) and the sum of the attitudes as well as the sum
of the subjective norms toward the specific behaviors (see Equation 4). Each of the above multiple regression analyses was computed separately on the responses obtained at Time 1, 2, and 3.

\[
\sum_{i=1}^{12} I_i = \sum_{i=1}^{12} A_i + \sum_{i=1}^{12} SN_i
\]  

(4)

\(i\) = the specific Behavior \(i\)

\(I_i\) = intention to perform Behavior \(i\)

\(A_i\) = attitude toward performing Behavior \(i\)

\(SN_i\) = subjective norm toward Behavior \(i\)

\(w_1\) and \(w_2\) are empirically determined weights

**Self-report measures of behavior.** All measures of behavior were obtained from subjects' self-reports which consisted of weekly self-reports and retrospective self-reports.

1. **Weekly self-reports:** During the two-month period, at the end of each week, 45 subjects completed a self-report questionnaire (see Questionnaire 3 in Appendix) of the extent to which they performed each of the specific dietary behaviors and the specific physical activities during the preceding week. Subjects indicated the extent to which they performed each of the behaviors on a single 7-point scale ranging from "all the time" to "never". A mean score for the first four weeks (weekly self-report for the first month), a mean score for the last three to five weeks.

\(^2\)Since at Time 3 subjects were given a two week period during which they could return their completed weekly questionnaires, there was some variability between subjects in the number of weeks during which they were completely the weekly questionnaires.
(weekly self-report for the second month), as well as an overall mean score (mean weekly self-report) for the whole two months were computed for each subject for each of the specific behaviors.

2. Retrospective self-reports: At Time 2, 44 subjects and at Time 3, 88 subjects completed a retrospective self-report questionnaire (see Questionnaire 4 in Appendix) indicating the extent to which they performed the specific dietary behaviors, specific physical activities, dieting in general, and physical activity in general during the preceding month (at Time 2) or during the preceding two months (at Time 3). As on the weekly self-reports, subjects indicated the extent to which they performed each of the behaviors on a single 7-point scale ranging from "all the time" to "never".

A Thurstone Scale was computed for the self-reports of dietary behaviors, physical activities, and an overall scale of all the specific behaviors. Thirty-one judges similar to the sample used in the present study were asked to indicate on an 11-point scale ranging from "favorable" to "unfavorable" the extent to which engaging in each of the specific dietary behaviors indicated a favorable or unfavorable attitude toward dieting. Similarly, they were asked to indicate the extent to which engaging in each of the specific physical activities indicated a favorable or unfavorable attitude toward physical activity. The median for each behavior was used as a scale value. Thus, in computing a scale of dietary behaviors, each subject's self-report score for a specific
dietary behavior was multiplied by the scale value for that behavior and the resulting products were summed for all dietary behaviors. Similarly, a scale of physical activities was computed. An overall scale of dietary behavior and physical activity was computed by summing the scale of dietary behaviors and the scale of physical activities. A Pearson Correlation Coefficient was obtained between the above scales and unweighted sums of the mean weekly self-reports and retrospective self-reports of the specific behaviors (for dietary behaviors, physical activities, and both). Since the correlations between the Thurstone Scales and the unweighted sums of the self-reports ranged between .94 and .98, only the unweighted sums of the self-reports will be included in the analyses.

**Weight Reduction Measures**

Weight reduction was assessed by using the actual number of pounds lost, percentage of body weight lost, percentage of excess weight loss (excess weight = weight at Time 1 - target weight), and the Reduction Index (Feinstein, 1959) (see Equation 5).

\[
\text{Reduction Index} = \frac{\text{weight loss}}{\text{excess weight}} \times \frac{\text{initial weight}}{\text{target weight}} \times 100
\]  

(5)

The target weight for each subject was determined according to the standards prescribed by the U.S. Department of Agriculture to be the desirable weight for the average woman of a particular height.

**RESULTS**

**Characteristics of the Sample of Subjects**

In order to describe the sample of subjects, the following descriptive statistics were computed on the data obtained from the 88 subjects
who reported at Time 3: the mean percent overweight at Time 1 was 10.28% (S.D. = 14.86); the mean rated ease/difficulty, on a 7-point scale (1 = easy, 7 = difficult), of losing weight was 4.94 (S.D. = 1.62); and the average diet and weight history score\(^3\) was 11.83 (S.D. = 6.18).

Subjects' weight reduction during the two-month period was measured on each of the following weight reduction indices: actual pounds lost, percent of body weight lost, percent of excess weight lost, and the Reduction Index (Feinstein, 1959). The means and standard deviations of weight reduction on each of the four measures are presented in Table 2. T-tests revealed that the mean weight reduction was not significantly greater than zero on any of the four weight reduction measures. Thus, although there was a tendency for subjects to lose some weight over the two-month period, this tendency was not significant.

In order to determine whether there were any significant differences in the characteristics of subjects assigned to each of the four experimental conditions, Monthly Questionnaire (monthly questionnaire vs. no monthly questionnaire) x Weekly Questionnaire (weekly questionnaires vs. no weekly questionnaires) analyses of variance were performed on the following dependent measures: percent overweight at Time 1, ease/difficulty of losing weight, diet and weight history scores, actual pounds lost, percent of body weight lost, percent of excess weight lost, and the Reduction Index. There were no significant main effects, nor interactions on any of the above dependent measures. Thus, there were

\[\text{3The actual diet and weight history index ranges from one and up. The higher the score, the more diet and weight history.}\]
TABLE 2

Weight Reduction During the Two-Month Period

<table>
<thead>
<tr>
<th>Weight Reduction Measures</th>
<th>Mean</th>
<th>S.D.</th>
<th>t^a</th>
<th>Significance of t (df=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Pounds Lost</td>
<td>.95</td>
<td>3.64</td>
<td>.26</td>
<td>n.s.</td>
</tr>
<tr>
<td>Percent of Body Weight Lost</td>
<td>.68</td>
<td>2.64</td>
<td>.26</td>
<td>n.s.</td>
</tr>
<tr>
<td>Percent of Excess Weight Lost</td>
<td>10.04</td>
<td>115.46</td>
<td>.09</td>
<td>n.s.</td>
</tr>
<tr>
<td>Reduction Index</td>
<td>10.78</td>
<td>115.75</td>
<td>.09</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

^a One-tailed t-tests were performed to determine whether the obtained means were significantly greater than 0.
no significant initial differences between the four groups of subjects, and the assignment of subjects to experimental conditions did not affect subjects' weight reduction.

Weight Reduction and Attitudes Toward Traditionally Used Concepts

In previous studies (eg. Leon & Chamberlain, 1973), correlations were computed between measures of attitudes toward such concepts as "eating", "the thin me", etc., and weight reduction or weight maintenance in order to study the relationship between attitudes and weight reduction or weight maintenance. The resulting correlations were usually low (Hall & Hall, 1974).

In the present study similar results were obtained. Pearson correlations were computed between subjects' attitudes, at Time 1, toward traditionally used concepts (i.e., "eating", "the thin me", "the fat me", "going out on dates", and "the me right now") and the four measures of weight reduction. The results are presented in Table 3. Only one of the correlations was statistically significant. There was a significant positive correlation between attitudes toward the concept "the thin me" and percent of body weight lost (r = .19, p < .05). Overall, the correlations were low, ranging from -.16 to .19.

Weight Reduction and Self-Report Measures of Behavior

In the present study, it was proposed that weight reduction, at least in part, is a result of engaging in a series of dietary behaviors and physical activities. It was hypothesized that the extent to which a person engages in these behaviors will be positively related to weight reduction.
TABLE 3

Correlations Between Attitudes Toward Traditionally Used Concepts and Measures of Weight Reduction

<table>
<thead>
<tr>
<th>Attitudinal Concepts</th>
<th>Measures of Weight Reduction</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual Pounds Lost</td>
<td>Percent of Body Weight Lost</td>
<td>Percent of Excess Weight Lost</td>
<td>Reduction Index</td>
<td></td>
</tr>
<tr>
<td>Eating</td>
<td>.01</td>
<td>.01</td>
<td>.08</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>The Thin Me</td>
<td>.17</td>
<td>.19*</td>
<td>.01</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>The Fat Me</td>
<td>-.15</td>
<td>-.16</td>
<td>.01</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Going Out On Dates</td>
<td>-.07</td>
<td>-.07</td>
<td>.16</td>
<td>.16</td>
<td></td>
</tr>
<tr>
<td>The Me Right Now</td>
<td>.05</td>
<td>.05</td>
<td>.08</td>
<td>.08</td>
<td></td>
</tr>
</tbody>
</table>

* p<.05
In order to examine the relationship between self-report measures of the various behaviors and actual weight reduction, Pearson correlation coefficients were computed between measures of weight reduction over the two-month period and subjects' self-report measures of the extent to which they performed the various behaviors during the two-month period. The following three self-report indices of behavior were computed:

1. **Index of mean-weekly self-reports:** For each subject, the weekly self-report scores were summed across the 12 specific behaviors and the mean over the eight-week period was computed. The resulting index for each of the 45 subjects who completed weekly questionnaires indicated extent to which she performed dietary behaviors and physical activities to reduce weight during the two-month period.

2. **Retrospective index of specific behaviors:** The retrospective self-reports at Time 3, of specific behaviors, were summed across the 12 specific behaviors for each of the 88 subjects. The resulting sum was a retrospective index for each subject of the extent to which she performed the specific behaviors during the two-month period.

3. **Retrospective index of general behaviors:** At Time 3, 88 subjects reported the extent to which they dieted in general and performed physical activity in general during the preceding two months. The two measures were summed for each of the 88 subjects resulting in a retrospective index of general behaviors for each subject during the two-month period.
Each of the above three indices of behavior were correlated with actual pounds lost, percent of body weight lost, percent of excess weight lost, and the Reduction Index. The results are presented in Table 4. As can be seen, the correlations between the self-report measures of behavior and the four measures of weight reduction, although generally positive were relatively low. Similar results were obtained when correlations were computed between the four measures of weight reduction and self-report measures of each of the specific behaviors. One reason for the low correlations could be the low variance in weight reduction; most subjects lost little or no weight during the two-month period.

The pattern of results was similar regardless of which index of behavior was used. However, this is not surprising since the correlations among the three indices of behavior were moderately high, ranging from .58 to .90. Although the weight reduction-behavior correlations were slightly lower for the behavioral index of mean-weekly self-reports than for the other two indices, this could be due to the smaller number of subjects for whom the former index was available.

Two of the four weight reduction measures tended to have higher positive correlations with each of the three behavioral indices. The correlation coefficients between each of the three measures of behavior and each of the first two weight reduction measures (actual pounds lost, and percent of body weight lost) were significant (p < .05); the correlations between each of the three measures of behavior and each of the last two weight reduction measures (percent of excess weight lost, and the Reduction Index) were not significant and were extremely low.
**TABLE 4**

Correlations Between Self-Report Measures of Behavior and Weight Reduction

<table>
<thead>
<tr>
<th>Weight Reduction Measures</th>
<th>Self-Report Measures of Behavior</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Index of Mean-Weekly Self-Reports</td>
<td>Retrospective Index of Specific Behaviors</td>
<td>Retrospective Index of General Behaviors</td>
</tr>
<tr>
<td>Actual Pounds Lost</td>
<td>.27*</td>
<td>.33***</td>
<td>.32**</td>
</tr>
<tr>
<td>Percent of Body Weight Lost</td>
<td>.26*</td>
<td>.34***</td>
<td>.31*</td>
</tr>
<tr>
<td>Percent of Excess Weight Lost</td>
<td>-.02</td>
<td>.02</td>
<td>.10</td>
</tr>
<tr>
<td>Reduction Index</td>
<td>-.01</td>
<td>.03</td>
<td>.10</td>
</tr>
</tbody>
</table>

* p<.05  
** p<.01  
*** p<.001
Multiple regression analyses on weight reduction and dietary behaviors and physical activities. In order to examine the relative contribution of dietary behaviors versus physical activities to weight reduction, multiple regression analyses were computed with weight reduction as the dependent variable and self-report measures of dietary behavior(s) and physical activity(ies) as the independent variables. A separate multiple regression was computed for each of the four measures of weight reduction paired separately with each of the three self-report measures of behavior resulting in 12 multiple regressions. The results of the regression analyses are presented in Tables 5, 6, and 7, for each of the three measures of behavior, respectively.

As would be expected from the results presented above, the pattern of results was similar regardless of which indices of behavior were used as the dependent variables. This is evident from the similar patterns of results reported in Tables 5, 6, and 7. Also, not surprisingly, when actual pounds lost or percent of body weight lost were the dependent variables, the multiple R's tended to be statistically significant and higher than when percent of excess weight lost or the Reduction Index were used as the dependent variables. In fact when the latter two measures of weight reduction were used as dependent variables, the multiple R's were extremely low and not statistically significant.

Overall, dieting behaviors appeared to contribute more to weight reduction (as measured by actual pounds lost or percent of body weight lost) than physical activity(ies). That is, regression weights of self-report measures of dieting tended to be statistically significant and higher than regression weights of self-report measures of physical
TABLE 5
Results of Multiple Regression Analyses Between Weight Reduction Measures and Mean Weekly Self-Reports

<table>
<thead>
<tr>
<th>Weight Reduction Measures</th>
<th>Regression Weights</th>
<th>Zero Order Correlations With Weight Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>Dieting</td>
</tr>
<tr>
<td>Actual Pounds Lost</td>
<td>.31</td>
<td>.35</td>
</tr>
<tr>
<td>Percent of Body Weight Lost</td>
<td>.30</td>
<td>.34</td>
</tr>
<tr>
<td>Percent of Excess Weight Lost</td>
<td>.08</td>
<td>-.09</td>
</tr>
<tr>
<td>Reduction Index</td>
<td>.07</td>
<td>.08</td>
</tr>
</tbody>
</table>

* p<.05
TABLE 6

Results of Multiple Regression Analyses Between Weight Reduction Measures and Retrospective Index of Specific Behaviors

<table>
<thead>
<tr>
<th>Weight Reduction Measures</th>
<th>Regression Weights</th>
<th>Zero Order Correlations With Weight Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>Dieting</td>
</tr>
<tr>
<td>Actual Pounds Lost</td>
<td>.41*</td>
<td>.44*</td>
</tr>
<tr>
<td>Percent of Body Weight Lost</td>
<td>.42*</td>
<td>.45*</td>
</tr>
<tr>
<td>Percent of Excess Weight Lost</td>
<td>.03</td>
<td>.03</td>
</tr>
<tr>
<td>Reduction Index</td>
<td>.04</td>
<td>-.04</td>
</tr>
</tbody>
</table>

* p<.001
Table 7

Results of Multiple Regression Analyses Between Weight Reduction Measures and Retrospective Index of General Behaviors

<table>
<thead>
<tr>
<th>Weight Reduction Measures</th>
<th>Regression Weights</th>
<th>Zero Order Correlations With Weight Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>Dieting</td>
</tr>
<tr>
<td>Actual Pounds Lost</td>
<td>.33**</td>
<td>.27*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.12</td>
</tr>
<tr>
<td>Percent of Body Weight Lost</td>
<td>.32**</td>
<td>.25*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.12</td>
</tr>
<tr>
<td>Percent of Excess Weight Lost</td>
<td>.11</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.01</td>
</tr>
<tr>
<td>Reduction Index</td>
<td>.12</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Dieting</th>
<th>Physical Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Pounds Lost</td>
<td>.31**</td>
<td>.22*</td>
</tr>
<tr>
<td>Percent of Body Weight Lost</td>
<td>.30**</td>
<td>.22*</td>
</tr>
<tr>
<td>Percent of Excess Weight Lost</td>
<td>.11</td>
<td>.05</td>
</tr>
<tr>
<td>Reduction Index</td>
<td>.12</td>
<td>.06</td>
</tr>
</tbody>
</table>

*p < .05

**p < .01
activity(ies). The regression weights of self-report measures of physical activity(ies) were not statistically significant in any of the 12 multiple regression analyses.

Behavior-weight reduction relationship for selected subgroups of subjects. Since the correlations between the measures of behavior and measures of weight reduction were relatively low for the sample as a whole, it was hypothesized that perhaps for certain subgroups of subjects there might be a stronger relationship between their behavior and weight reduction. For example, for subjects who reported that it was easy for them to lose weight, the relationship between behavior and weight reduction might be stronger than for those who reported that it was difficult for them to lose weight. Thus, on each of the variables listed below, subjects were divided at the median into two groups: those scoring high versus those scoring low on each variable. Correlation coefficients between the three measures of behavior and the four measures of weight reduction were computed for each subgroup of subjects. The corresponding correlation coefficients were compared between those subjects scoring high and those scoring low on each of the following variables:

1. I-E scale: Internals (I-E ≤ 0) vs. Externals (I-E > 0)
2. Diet and weight history: Less diet and weight history (score ≤ 10.67) vs. more diet and weight history (score > 10.67)
3. Ease/difficulty of losing weight: Easy (score ≥ 3) vs. Difficult (score < 3)
4. Percent overweight: 10% overweight or less vs. more than 10% overweight

5. Actual pounds lost: actual pounds lost ≤ 0 vs. actual pounds lost > 0

This was done in order to examine whether in fact there was a difference between the behavior-weight reduction relationship for the different groups of subjects.

The results are presented in Table 8. There were no significant differences in the behavior-weight reduction correlation coefficients between the subgroups of subjects that were compared with one exception. The correlations were significantly higher (p < .001) for subjects who lost weight as compared to those subjects who lost no weight or gained weight when actual pounds lost or percent of body weight lost were used as measures of weight reduction. This provides some support to the explanation that the low behavior-weight reduction correlations obtained for the sample as a whole were due to the low average weight loss.

Summary. Overall, it appears that the relationship between weight reduction and self-report measures of dietary behavior(s) and physical activity(ies) is not strong. This is particularly true when percent of excess weight lost and the Reduction Index are used as measures of weight reduction. When using actual pounds lost and percent of body weight lost as measures of weight reduction, the relationship between all three self-report measures of behavior and weight reduction is somewhat stronger. In addition, the behavior-weight reduction relationship was not stronger for selected subgroups of subjects with one
<table>
<thead>
<tr>
<th>Diet and Weight History</th>
<th>Ease/Difficulty of Losing Weight</th>
<th>I-E Scale</th>
<th>Weight Reduction Variables</th>
<th>Self-Report Measure of Behavior</th>
<th>Index of Mean Weekly Work</th>
<th>Self-Report Measure of Specific Behaviors</th>
<th>Retrospective Index of General Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>exter. I-E &lt; 0</td>
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<td>3</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>int. I-E &gt; 0</td>
<td>difficult &gt; 3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Correlations between self-report measures of behavior and weight reduction measures for subgroups of subjects.
### Table 8 Continued

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<td>0</td>
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<tr>
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<td>Less</td>
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<td>Less</td>
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<tr>
<td>Weight reduction</td>
<td>Retrospective index of general behaviors</td>
<td>Retrospective index of specific behaviors</td>
<td>Retrospective index of specific behaviors</td>
<td>Retrospective index of specific behaviors</td>
<td>Retrospective index of general behaviors</td>
<td>Retrospective index of general behaviors</td>
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<tr>
<td>Self-reports</td>
<td>Index of mean weekly self-reports</td>
<td>Variables</td>
<td>Self-report measure</td>
<td>Behavior</td>
<td>Self-report measure</td>
<td>Behavior</td>
<td>Self-report measure</td>
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</tbody>
</table>

*4 = reduction index

\[ q_1 = \text{actual number of pounds lost} ; \quad 2 = \text{percent of body weight lost} ; \quad 3 = \text{percent of excess weight lost} ; \quad p = \text{percent of excess weight lost} ; \quad 1 - p = \text{percent of excess weight lost} \]

\[ \text{p} \leq 0.05 \]

\[ \text{p} \leq 0.01 \]

\[ \text{p} \leq 0.001 \]
exception. Self-report measures of dietary behavior(s) appeared to have a stronger positive relationship with weight reduction than self-report measures of physical activity(ies) as reflected by the statistically significant regression weights of self-report measures of dietary behavior(s) and not of physical activity(ies) when actual pounds lost and percent of body weight lost were used as measures of weight reduction.

The overall weak relationship between weight reduction and self-report measures of behavior may be a result of several factors. First, the present study did not provide a controlled weight reduction situation for the subjects. That is, subjects were not instructed as to the behaviors that might result in weight reduction. In the present study, subjects were not even explicitly encouraged to lose weight. Second, the relative short duration (two months) of the experiment did not allow for sufficient weight loss. As a result of the above two factors, the average weight loss of subjects was low and the resulting low variability may have contributed to the low behavior-weight reduction relationship. Furthermore, since weight reduction is not always strictly under behavioral control, extremely high correlations would not be expected even in longer and more controlled experiments.

Intentions and Self-Report Measures of Behavior

Introduction. It was hypothesized that the extent to which a person engages in various weight reducing behaviors could be predicted from the person's intentions to engage in those particular behaviors. However, a strong positive correlation between intentions and behavior could only be expected if appropriate measures of behavioral intentions
were correlated with corresponding overt behaviors. In order to examine the relationship between intentions and behavior, Pearson correlation coefficients were computed between the measures of intentions and subjects' self-report measures of the extent to which the corresponding behaviors were performed.

The relationship between intentions at Time 1 and retrospective self-report measures one month hence (Time 2) and two months hence (Time 3) were examined. The retrospective self-report measures were obtained for the seven specific dietary behaviors, the five specific physical activities, dieting in general and physical activity in general.

In addition to the retrospective self-report measures, for half of the subjects (45) weekly self-report measures of the seven specific dietary behaviors and the five specific physical activities were obtained. As with retrospective self-report measures, correlations were computed between intentions at Time 1 and the weekly self-reports for the first month and the mean weekly self-report (mean scores for the two-month period). Also, correlations were computed between intentions at Time 2 and the weekly self-reports for the second month.

For each of the 12 specific behaviors a correlation coefficient was computed between the measure of intention toward the behavior and the corresponding self-report measure of behavior. In order to examine the overall relationship between intentions toward performing the specific behaviors and self-report measures of performance of the behaviors, additional correlation coefficients were computed between sums of intentions (summing across the specific behaviors) and corresponding sums of self-report measures. That is a correlation coefficient was
computed between the sum of intention measures of the specific dietary behaviors and the corresponding sum of self-report measures. Similarly, intentions toward the specific physical activities were summed and correlated with the sum of the corresponding self-report measures. Finally, a correlation coefficient was computed between the sum of intention measures for all 12 specific behaviors and the corresponding sum of self-report measures.

The correlations described above were computed between intentions and retrospective self-reports as well as between intentions and weekly self-reports. However, it should be noted that correlations between retrospective self-report measures and weekly self-report measures ranged from .64 to .87. Therefore, since the two measures of behaviors are strongly correlated with each other, it is not surprising that the results presented below are similar regardless of which of the two measures of behavior is used.

Intentions at Time 1 and self-report measures of behavior during the first month. Half of the subjects (45) completed retrospective self-report measures at Time 2. The correlations between their intentions at Time 1 and their retrospective self-report measures, at Time 2, for the seven specific dietary behaviors, five specific physical activities, dieting in general, and physical activity in general are presented in Table 9. All correlation coefficients between intentions and corresponding retrospective self-report measures for each of the 12 specific behaviors were statistically significant \((p < .01)\) with two exceptions. Overall, the correlations between intentions and retrospective self-reports for the specific behaviors were high as is
<table>
<thead>
<tr>
<th>Specific Physical Activities</th>
<th>Specific Dietary Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase participation in sports</td>
<td>Decrease alcohol drinking</td>
</tr>
<tr>
<td>Exercise</td>
<td>Maintain regular eating schedule</td>
</tr>
<tr>
<td>Increase amount of walking</td>
<td>Decrease food intake</td>
</tr>
<tr>
<td>Avoid excessive sleeping</td>
<td>Avoid tempting places</td>
</tr>
<tr>
<td>Avoid inactivity</td>
<td>Cut down on starchy foods</td>
</tr>
<tr>
<td>Avoid snacking</td>
<td></td>
</tr>
<tr>
<td>Sum of specific physical activities</td>
<td>Sum of dietary behaviors</td>
</tr>
</tbody>
</table>

**Table 9**

The first month at Time 2 and retrospective measures at Time 1 and self-report measures at Time 1 and retrospectively measured correlations between Intentions at Time 1 and self-report measures at Time 2 for the first month of behavior at Time 2 and week 1 for the first 4 weeks.
<table>
<thead>
<tr>
<th>Physical Activity in General</th>
<th>Dieting in General</th>
<th>Sum of Specific Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>59**</td>
<td>68***</td>
<td>57***</td>
</tr>
<tr>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.05</td>
</tr>
</tbody>
</table>

The table presents correlations between intentions at Time 1 and retrospective measures at Time 2 and self-reports for the first month at Time 2. The significance levels are indicated by asterisks: ** denotes p < 0.01, *** denotes p < 0.001, and * denotes p < 0.05.
evident from the relatively high correlations between the sums of intention measures and the corresponding sums of retrospective self-reports. The correlations between intentions to diet in general and perform physical activity in general and the corresponding retrospective self-reports were also high and statistically significant (p < .001).

For half of the subjects (45) weekly self-report measures of all 12 specific behaviors were available. Correlations were computed between intentions at Time 1 and the corresponding weekly self-reports averaged over the first four weeks. The results are also presented in Table 9. All correlation coefficients between intentions and corresponding weekly self-reports of behavior for each of the 12 behaviors were statistically significant (p < .05). Again, overall, the correlations between intentions and self-report measures were high as is evident from the relatively high correlations between the sums of intention measures and the corresponding sums of weekly self-reports.

In sum, moderately high correlations were obtained between intentions at Time 1 and either of the two self-report measures of behavior for the first month. However, for some of the specific behaviors, there were some differences in the size of the correlation coefficients when the two different self-report measures were used.

**Intentions at Time 1 and self-report measures of behavior during the two-month period.** Of the 94 subjects, 88 subjects completed retrospective self-report measures at Time 3. The correlations between their intentions at Time 1 and their retrospective self-report measures two months hence of the 12 specific behaviors, dieting in general, and
physical activity in general are reported in Table 10. All correlations were relatively high and statistically significant below the $p < .05$ level.

Again, for half of the subjects (45) weekly self-report measures of all 12 specific behaviors were available. Correlations were computed between intentions at Time 1 and the corresponding weekly self-reports averaged over the two-month period. The results are also presented in Table 10. All correlations were again relatively high and statistically significant below the $p < .05$ level with one exception.

Overall, the correlations between intentions at Time 1 and self-report measures of behavior for the two-month period were high. However, the relationship between intentions and self-report measures appeared to be slightly stronger when weekly self-report measures were used.

The correlations tended to be slightly higher between intentions at Time 1 and self-report measures for the two-month period than correlations between the same intentions and self-report measures for the first month. This pattern of results is not surprising. At Time 1, subjects were asked to indicate their intentions to perform the behaviors during the next two months. Thus, it would be expected that their self-report measures of behavior during the two-month period versus the first month would be more highly correlated with their intentions.

Intentions at Time 2 and self-report measures of behavior during the last month. Measures of intentions at Time 2 and self-report measures of behavior during the last month were available for only 24 subjects. Their weekly self-reports of the 12 specific behaviors for the second month were correlated with the corresponding intentions at
<table>
<thead>
<tr>
<th>Behavior</th>
<th>Correlations between Intentions at Time 1 and Time 2 Reports of Behavior During the Two-Month Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise</td>
<td>Sum of Specific Physical Activity Interventions Increase participation in sports *******</td>
</tr>
<tr>
<td>Increase</td>
<td>Quantity of walking *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Excessive sleeping *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Inactivity *******</td>
</tr>
<tr>
<td>Decrease</td>
<td>Alcohol drinking *******</td>
</tr>
<tr>
<td>Maintain</td>
<td>Regular eating schedule *******</td>
</tr>
<tr>
<td>Maintain</td>
<td>Balanced diet *******</td>
</tr>
<tr>
<td>Decrease</td>
<td>Food intake *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Permanent changes *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Snacking *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Eating at home *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Eating restaurants *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Eating at work *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Snacking *******</td>
</tr>
<tr>
<td>Avoid</td>
<td>Eating at home *******</td>
</tr>
</tbody>
</table>

Table 10
<table>
<thead>
<tr>
<th></th>
<th>Physical Activity in General</th>
<th>Dieting in General</th>
<th>Sum of Specific Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports at Time 3</td>
<td><em>7</em>**</td>
<td><em>55</em>**</td>
<td></td>
</tr>
<tr>
<td>Time 1 and Mean Weekly Self-Reports</td>
<td><em>52</em>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlations Between Intentions at Time 1 and Retrospective Self-Report Behavior</td>
<td><em>63</em>**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10 Continued
Time 2. The results are presented in Table 11. All correlations were statistically significant ($p < .01$) and relatively higher (.45 or higher). One reason for the high correlations could be that subjects had a chance to readjust their behavioral intentions at Time 2 based on their behaviors during the preceding month.

**Noncorresponding measures of intentions and behavior.** In the previous sections correlations were presented only between corresponding measures of intentions and behavior. The measures of intentions and behavior were defined as corresponding only if the two measures were of the same behavior at the same level of specificity. If the two measures did not correspond, a high correlation between the two measures would not be expected. Several correlation coefficients were computed between intentions measured at Time 1 and noncorresponding self-report measures of behavior at Time 3. Overall, the resulting correlations tended to be lower than the correlations presented in the sections above. For example, the correlation between intentions to diet in general (a more general behavior) and the self-report measure of the extent to which subjects decreased alcohol drinking (a more specific behavior) was .13; the correlation between intentions to perform physical activity (a more general behavior) and the self-report measure of the extent to which subjects increased amount of walking (a more specific behavior) was .17. These results further emphasize the importance of obtaining corresponding measures of intentions and behavior when attempting to predict the latter from the former.

**Summary.** Correlations between intentions and the corresponding self-report measures of behavior were positive and tended to be rela-
Table 11
Correlations Between Intentions at Time 2 and Self-Report Measures of Behavior During the Last Month

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Correlations between intentions at Time 2 and weekly self-reports for the second month</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECIFIC DIETARY BEHAVIORS</td>
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</tr>
<tr>
<td>Avoid snacking</td>
<td>.45*</td>
</tr>
<tr>
<td>Cut down on starchy foods</td>
<td>.58**</td>
</tr>
<tr>
<td>Avoid tempting places</td>
<td>.64**</td>
</tr>
<tr>
<td>Decrease food intake</td>
<td>.60**</td>
</tr>
<tr>
<td>Maintain balanced diet</td>
<td>.73**</td>
</tr>
<tr>
<td>Maintain regular eating schedule</td>
<td>.71**</td>
</tr>
<tr>
<td>Decrease alcohol drinking</td>
<td>.66**</td>
</tr>
<tr>
<td>Sum of Dietary Behaviors</td>
<td>.53**</td>
</tr>
<tr>
<td>SPECIFIC PHYSICAL ACTIVITIES</td>
<td></td>
</tr>
<tr>
<td>Avoid inactivity</td>
<td>.72**</td>
</tr>
<tr>
<td>Avoid excessive sleeping</td>
<td>.77**</td>
</tr>
<tr>
<td>Increase amount of walking</td>
<td>.70**</td>
</tr>
<tr>
<td>Exercise</td>
<td>.79**</td>
</tr>
<tr>
<td>Increase participation in sports</td>
<td>.77**</td>
</tr>
<tr>
<td>Sum of Specific Physical Activities</td>
<td>.88**</td>
</tr>
<tr>
<td>SUM OF SPECIFIC BEHAVIORS</td>
<td>.79**</td>
</tr>
</tbody>
</table>

* p < .01
**p < .001
tively high. High correlations, with a few exceptions, were found regardless of whether the measures were of more general behavior (eg. dieting in general) or more specific behavior (eg. avoiding snacking between meals). Therefore, it appears that various weight reducing behaviors can be predicted from the person's intentions to engage in those particular behaviors. The next question posed was the extent to which intentions could be predicted using the Fishbein-Ajzen model.

**Intentions, Attitudes, and Subjective Norms**

**Introduction.** At Time 1, 94 subjects completed a questionnaire measuring their intentions, attitudes, and subjective norms toward various behaviors related to weight reduction. At Time 2, half of the subjects (44) completed the identical questionnaire and at Time 3, 88 of the subjects again completed the same questionnaire. The behaviors consisted of specific dietary behaviors (seven behaviors), specific physical activities (five behaviors), dieting in general (one behavior), physical activity in general (one behavior), weight reduction (one behavior), and weight reducing behaviors (one behavior). For each of the above 16 measures, at each of the three time periods, a multiple regression was computed. Thus, a total of 48 separate multiple regressions were computed with intentions as the dependent variable and attitudes and subjective norms the independent variables as proposed by the Fishbein-Ajzen model.

According to the Fishbein-Ajzen model, attitudes toward the behavior and subjective norms are the two major factors that determine behavioral intentions. Therefore, high multiple R's would be expected.
No predictions were made as to the relative contributions of attitudes versus subjective norms in determining behavioral intentions.

The results of the multiple regression analyses at Times 1, 2, and 3 are presented in Tables 12, 13, and 14, respectively. In each of the three tables the following data are presented for each of the 16 measures: the multiple R (R); the regression weight of attitudes \( (A_p) \) and of the subjective norms \( (SN) \); the mean score on the intention measures \( (I) \), the attitudes measures \( (A_p) \), and the subjective norms measures \( (SN) \); the zero order correlation between intentions and attitudes and between intentions and subjective norms; and the number of subjects included in the analysis \( (N) \). The scales for measuring intentions, subjective norms, and attitudes were scored such that the higher the score, the stronger the intentions, the more positive the attitudes, and the more positive the subjective norms. Intentions and subjective norms were each measured on a single 7-point scale, that is, scores could range from one to seven. Attitudes were based on the sum over four, 7-point scales and thus, could range from 4 to 28.

Specific dietary behaviors. As predicted, the multiple R's for each of the seven dietary behaviors at Time 1 (see Table 12), were statistically significant \( (p < .001) \) ranging from .43 to .71. The regression weights of attitudes toward each of the seven behaviors were all statistically significant \( (p < .01) \). Also, the regression weights of subjective norms toward each of the seven behaviors were statistically significant \( (p < .05) \) with only one exception.

At Time 2 (see Table 13), again the multiple R's for each of the seven dietary behaviors were statistically significant \( (p < .001) \) and
### Table 12

Results of Multiple Regression Analyses on Intentions, Attitudes, and Subjective Norms at Time 1

<table>
<thead>
<tr>
<th>Specific Dietary Behaviors</th>
<th>Behavior</th>
<th>Specific Physical Activities</th>
<th>SUM of Specific Behaviors</th>
<th>Increase Participation in Sports</th>
<th>Decrease Alcohol Intake</th>
<th>Decrease Alcohol Intake</th>
<th>Maintain Regular Eating Schedule</th>
<th>Decrease Food Intake</th>
<th>Avoid Tempting Places</th>
<th>Avoid Snacking</th>
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<tr>
<td>Avoid excessive eating.</td>
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<td>Avoid sedentary activity.</td>
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<td>0.47**</td>
<td>0.44**</td>
<td>0.47**</td>
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<td>Increase amount of walking</td>
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<td></td>
<td>52**</td>
<td>0.45**</td>
<td>0.47**</td>
<td>0.31**</td>
<td>0.47**</td>
<td>0.44**</td>
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<td>0.07</td>
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<td>0.21**</td>
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<td>2.05</td>
<td>2.05</td>
<td>2.05</td>
<td>2.05</td>
</tr>
</tbody>
</table>

**Sum of Specific Behaviors**

**Exercise**
- Increase participation in sports

**Increase amount of walking**
- Avoid excessive sleeping

**Avoid inactivity**

**Specific Physical Activities**
- Decrease alcohol drinking
- Maintain regular eating schedule
- Maintain balanced diet
- Decrease food intake

**Cut down on starchy foods**
- Avoid smoking

**Specific Dietary Behaviors**
- Increase participation in sports
- Exercise
- Increase amount of walking
- Avoid excessive sleeping
- Avoid inactivity

---

**Intention, Attitudes, and Subjective Norms at Time 2**

Results of Multiple Regression Analyses on

Table 13
REDUCE WEIGHT

<table>
<thead>
<tr>
<th></th>
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**SUM OF SPECIFIC BEHAVIORS**

Increase participation in sports
Exercise
Increase amount of walking
Avoid excessive sleeping
Avoid inactivity

**SPECIFIC PHYSICAL ACTIVITIES**

Decrease alcohol drinking
Maintain regular eating schedule
Maintain balanced diet
Decrease food intake
Avoid tempting places
Cut down on starchy foods
Avoid snacking

**SPECIFIC DIETARY BEHAVIORS**

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Results of Multiple Regression Analyses on

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All r > 0.25 statistically significant at 0.01 level
All r > 0.20 statistically significant at 0.05 level

Table 14 continued
tended to be slightly higher than at Time 1 ranging from .54 to .74. The regression weights of attitudes toward each of the seven behaviors were statistically significant (p < .01) and again tended to be slightly higher than the corresponding regression weights at Time 1. None of the regression weights of subjective norms toward each of the seven behaviors were statistically significant (p < .05) and they tended to be substantially lower than the corresponding regression weights of attitudes.

At Time 3 (see Table 14), again the multiple R's for each of the seven dietary behaviors were statistically significant (p < .01) and tended to be slightly higher than at Time 1, ranging from .37 to .72. Again, all the regression weights of attitudes toward each of the seven behaviors were statistically significant (p < .01) and, as was found at Time 2, tended to be higher than the corresponding regression weights of subjective norms. Four of the seven regression weights of subjective norms were statistically significant at the .05 level or less and tended to be slightly higher than the corresponding regression weights at Time 2.

Specific physical activities. The patterns of results of the multiple regression analyses on the five specific physical activities at each of the three time periods were similar to the results for the specific dietary behaviors with a few exceptions. These exceptions will be pointed out as the results are presented.

The multiple R's at Time 1 (see Table 12), for each of the five physical activities were statistically significant (p < .01) and ranged from .32 to .52. The regression weights of attitudes toward each of the five behaviors were statistically significant (p < .01). The
regression weights of subjective norms toward each of the five behaviors were not statistically significant with only one exception and tended to be substantially lower than the corresponding regression weights of attitudes. A similar pattern of results was found for the specific dietary behaviors at Times 2 and 3 but not at Time 1.

At Time 2 (see Table 13), the multiple R's for each of the five behaviors were statistically significant \( (p < .01) \) ranging from .36 to .75; all regression weights of attitudes toward the five behaviors were statistically significant \( (p < .001) \) with only one exception. The multiple R's as well as the regression weights of attitudes at Time 2 tended to be higher than the corresponding multiple R's and regression weights at Time 1 and this pattern was also found for the specific dietary behaviors. The regression weights of the subjective norms toward the five specific physical activities were not statistically significant with only one exception, and as was found at Time 1, tended to be substantially lower than the corresponding regression weights of attitudes.

At Time 3 (see Table 14), the results of the multiple regression analyses of the specific physical activities were almost identical to the results at Time 2. The multiple R's at Time 3 were all statistically significant \( (p < .001) \) and tended to be slightly higher than the corresponding multiple R's at Time 1. As was found at Times 1 and 2, at Time 3 attitudes toward the behaviors tended to contribute more to the prediction of intentions then subjective norms as reflected by the statistical significance of all five regression weights of attitudes \( (p < .001) \) and the statistical significance \( (p < .05) \) of
only one out of the five regression weights of subjective norms.

**Sum of specific dietary behaviors and specific physical activities.**
In order to obtain an overall measure of the extent to which intentions are related to attitudes and subjective norms for the specific behaviors, a multiple regression analysis was performed on the sum of intentions toward the specific behaviors (both dietary behaviors and physical activities) and the sum of the attitudes as well as the sum of the subjective norms toward the specific behaviors (see Equation 4 in Methods section). Separate multiple regression analyses were computed for Times 1, 2, and 3, and the results are also presented in Tables 12, 13, and 14, respectively. The mean scores on the intentions, attitudes, and subjective norms were divided by 12 to make them comparable to the corresponding mean scores on the other 16 measures.

The multiple R's at each time period were relatively high and statistically significant (p < .001) and increased from Time 1 through to Time 3. At Times 1, 2, and 3, 34%, 46%, and 50%, respectively, of the variance in intentions was accounted for by the attitudes and subjective norms. Regression weights for both attitudes and subjective norms were statistically significant (p < .05) at all three time periods with only one exception. At each time period, the regression weight of attitudes tended to be higher than that of subjective norms.

**Dieting and physical activity.** Separate multiple regression analyses were computed on dieting in general ("adhering to a diet to reduce weight") and physical activity in general ("engaging in physical activity to reduce weight"). Multiple regression analyses were computed on the responses to the above two questions at Times 1, 2, and 3
and the results are presented in Tables 12, 13, and 14, respectively.

The multiple R's for dieting and physical activity at all three time periods were relatively high (ranging from .51 to .73), and statistically significant (p < .001). Attitudes toward the behaviors appeared to contribute more in the prediction of intentions than subjective norms at all three time periods and for both dieting and physical activity as reflected by the statistical significance of all the regression weights of attitudes (p < .001) and the statistical significance of none of the regression weights of subjective norms (p > .05). The pattern of results presented above was similar to that of the sum of specific dietary behaviors and physical activities. That is, the multiple R's were relatively high and attitudes tended to account for more of the variance in intentions than did subjective norms.

Reducing weight and weight reducing behaviors. Separate multiple regression analyses were computed on intentions, attitudes, and subjective norms toward reducing weight and toward engaging in weight reducing behaviors. Multiple regression analyses were computed on the responses to the above two questions at Times 1, 2, and 3, and the results are presented in Tables 12, 13, and 14, respectively.

The results were similar for reducing weight and weight reducing behaviors. However, this is not surprising since the correlations between the three measures (i.e., intentions, attitudes, and subjective norms) toward reducing weight and the corresponding three measures toward weight reducing behaviors at each of the three time periods ranged from .83 to .92. All the multiple R's were high ranging from .54 to .70 and were statistically significant (p < .001). All regres-
sion weights of attitudes were statistically significant \((p < .001)\) while regression weights of subjective norms were not with only one exception. This general pattern of results was similar to that found for most of the other behaviors.

**Summary.** As predicted, the multiple regression analyses resulted in relatively high multiple R's between intentions and attitudes and subjective norms. This was true regardless of whether intentions were toward more specific or more general behaviors. No consistent pattern emerged in the variations in the multiple R's over time with one exception. The multiple R's tended to increase from Time 1 through to Time 3 for the specific behaviors as was revealed in the analysis of the sum of specific dietary behaviors and physical activities. For almost all behaviors at all three time periods, the regression weights of attitudes were statistically significant while the regression weights for subjective norms in most of the analyses were not.

**DISCUSSION**

The major purpose of the present study was to predict weight reduction over a two-month period. According to the Fishbein-Ajzen model relating behavior and intentions, behavior can be predicted from a person's intentions to perform that particular behavior, given that the measures of intentions and behavior correspond. Behavioral intentions, in turn, are a function of the weighted sum of two variables: 1) the person's attitude toward performing the behavior in question under a given set of circumstances; and 2) the person's perception of what most people who are important to him think he
should or should not do in relation to the behavior in question. This latter variable has been called the subjective norm or normative component.

In the present study, weight reduction was assumed to be the result of a series of dietary behaviors and physical activities. It was hypothesized that the performance of these behaviors could be predicted using the Fishbein-Ajzen model. Hence, weight reduction could be predicted. Results supported the applicability of the Fishbein-Ajzen model of predicting these behaviors from intentions. As hypothesized, the correlations between measures of intentions and corresponding self-report measures of behavior tended to be positive, statistically significant and relatively high. This was found across all behaviors, across both self-report measures (weekly and retrospective), and over one and two-month duration. Furthermore, results supported the relationship between intentions, attitudes, and subjective norms proposed by the model. As predicted, multiple regression analyses computed on the above three variables revealed relatively high and statistically significant multiple R's. These results were obtained across all behaviors and at each of three time periods. No predictions were made as to the relative contribution of attitudes versus subjective norms in the prediction of intentions. However, the pattern of results suggested that attitudes tended to have a stronger positive relationship to intentions than subjective norms. This may have been due to subjects' reluctance to indicate that their behavior was influenced by the opinion of others.
While the present study provides additional support for the Fishbein-Ajzen model in predicting behavior, the relationship between self-report measures of behaviors specified in this study and weight reduction was less clear-cut. Despite the fact that correlations between the behaviors and weight reduction tended to be positive and statistically significant, they were relatively low. One reason for the low correlations could be the fact that self-report measures of behavior were used. That is, it is possible that subjects were biased in their self-report measures; for example, in accordance with expressed intentions, subjects may have indicated that they performed a given behavior to a larger extent than they, in fact, did. Although this is a definite possibility and it is not possible in the present study to compare actual behavior to self-report measures of behavior, there was no particular motivation for subjects to have willfully falsified their responses. In the present study, subjects were not asked to make an explicit commitment to perform the specified behaviors -- they were not even encouraged to lose weight. Furthermore, anonymity was stressed in the study thus, subjects had no reason to believe that they would be confronted by the experimenter for not performing an intended behavior.

If the use of self-report measures of behavior was not the primary reason for the observed low correlations, several other factors may have contributed to the observed findings. First the duration of the experiment may not have been sufficient. Although on the average, subjects lost some weight during the two months, the loss was not significant and the variance of weight reduction was low. Some support
was found for this: behavior-weight reduction correlations were higher for subjects who lost some weight than for ones who lose no weight or gained weight. Second, although subjects knew they were involved in a study of weight reduction, they were not necessarily involved in an active effort to lose weight; hence, there was neither support nor encouragement to perform the behaviors that the present experiment focused on. Additionally, the weight reducing behaviors may not have been appropriate enough. That is, the behaviors studied may not have had immediate impact on weight loss. The behaviors focused on in the present study were obtained by asking a sample of subjects for a list of behaviors that they would engage in if they wanted to lose weight. Some of the behaviors elicited may, in fact, be unrelated to weight reduction whereas certain relevant behaviors may have been overlooked. In future research, it might be preferable to establish that the behaviors used do have impact on weight reduction.

The present results suggest that further studies of weight reduction adopt strategies to incorporate the above listed factors. Since weight reduction takes time, studies should be planned to be longitudinal in nature. Increased time would allow subjects to lose more weight on the average, and would probably result in greater variance of weight reduction. A program of specific behaviors should be defined for subjects. Such specificity would improve the precision of self-report measures of behavior. If behaviors are specified which have known or demonstrated impact on weight reduction, the relationship between the behaviors and their consequences can be more clearly examined. Finally, methods should be incorporated to encourage and
support the behaviors that have been specified, thereby insuring their performance. In short, it would seem that research efforts might best proceed by establishing formal connections with ongoing weight reduction programs, which for the most part, adequately deal with these factors.

In fact, results indicate that the Fishbein-Ajzen model might have particular applied value to formal programs of weight reduction. Given a set of specific behaviors, subjects' intentions toward performance of them could be obtained. Furthermore, the behaviors could be assigned relative weights depending on the extent of each behavior's impact on weight reduction. An individually tailored weight reduction program could thereby be developed to emphasize the most effective weight reducing behaviors that a person is inclined to perform.

The model holds the potential for even further analyses. Intentions are a function of attitudes and subjective norms. Additional research could be done as to the relative contributions of attitudes versus subjective norms in determining intentions. Furthermore, based on the Fishbein-Ajzen model which proposes that attitudes are a function of beliefs regarding the consequences of a behavior and the evaluation of these beliefs (Equation 2) and the subjective norms are a function of the person's beliefs about the expectations of relevant others and the person's motivation to comply (see Equation 3), the underlying factors of the individual's attitudes and subjective norms could be examined. With such information, programs could institute to affect a person's attitudes and/or perceptions of the expectations of others.

Thus far, it has been assumed that weight reduction is simply the
result of dietary behaviors and physical activity. However, this may be an oversimplification. Physiological differences do exist between individuals in that for some people the impact of one behavior or weight reduction program may not be the same on weight loss as for other individuals. That is, a general behavior may be effective for some and not for other individuals even though all of them perform the behaviors to the same extent. Thus, even under ideal conditions, the relationship between behavior and weight reduction may not be perfect. Therefore, in addition to the approach suggested in the present study, physiological differences among individuals may also have to be taken into account.

However, the feasibility of the approach suggested could be studied in areas conceptually similar to weight reduction where the relationship between behavior and consequence is more clear-cut. The present study differed from previous studies using the Fishbein-Ajzen model in that the main focus was the prediction of a consequence of a series of behaviors rather than a single behavior. The model has already been shown to be successful in the prediction of single behaviors as was discussed in the Introduction. Generally, however, a consequence of various behaviors cannot be accurately predicted from intentions toward a specific behavior. One predictive model might be the sum of the intentions toward these behaviors as a predictor of that consequence. However, although the behaviors selected may be known to have an impact on the consequence or result in question, that impact may vary in magnitude from behavior to behavior. Thus, a more precise prediction of the consequence may be a weighted sum of intentions to perform the relevant
behaviors. The weights would be a function of the relative impact of each behavior on the consequence.

The applicability of such an approach could be examined in an area such as energy conservation. As is true of weight reduction, conservation is the result of a series of behaviors. However, unlike weight reduction, there is a direct relationship between certain behaviors and conservation. Once relevant behaviors are selected, a weighted sum of intentions toward these behaviors could be used to predict conservation consequences. If such an approach proves successful in predicting the conservation of energy, application of the Fishbein-Ajzen model could prove to be useful in attempting to determine the underlying factors affecting behavioral intentions toward conservation. As was suggested with weight reduction, the relative contribution of attitudes and subjective norms in determining intentions could be examined as well as the underlying beliefs of the attitudes and subjective norms.

In sum, the present study provided additional support for the Fishbein-Ajzen model; suggested practical implications for the use of the model in formal weight reduction programs; suggested that weight loss is more complex than simply the result of a series of behaviors; and indicated that the model might be applied to predict consequences of behaviors.
REFERENCES


Collins, B. E. Four components of the Rotter Internal-External scale: Belief in a difficult world, a just world, a predictable world,


Newton, N., & Newton, M. Relationship of ability to breast feed and maternal attitudes toward breast feeding. Pediatrics, 1950, 5, 869-875.


The following is a questionnaire dealing with people's attitudes toward weight reduction. We are interested in what people's attitudes are toward various aspects of weight reduction, and how stable these attitudes are. Therefore, we would like you to complete the following questionnaire today, and within the next two months we will get in touch with you again and ask you to complete an additional questionnaire.

The information you give us is totally confidential. No one other than the experimenter will have access to your responses.

In order for us to obtain valid and reliable data, it is very important that you answer all the questions carefully and honestly.

Age _______ Height _______ Present weight _______

1. How many lbs. over your desired weight are you now? _____lbs.
What is your ideal weight? _____lbs.

* How many lbs. over your desired weight were you at your maximum weight? _____lbs. (score: 1 pt./5 lbs.)

2. Have you ever been on a reducing diet ___Yes ___No
If Yes: Are you dieting now? ___Yes ___No

* How often are you dieting?
_____rarely; _____sometimes; _____usually; _____always (score: 0-3)

* 3. What is the maximum amount of weight (in lbs.) that you have ever lost within one month? _____ (score: 1 pt./5 lbs.)
Why did you lose the weight? (reducing diet, reasons of health or prolonged illness, change of environment, etc.)
4. In a given week how much can your weight fluctuate?
   * Maximum weight gain _____ lbs.  (score: 1 pt./3 lbs.)
   Maximum weight loss _____ lbs.

*5. In a typical week how much does your weight fluctuate? (score: 1 pt/3 lbs.)

6. If you wanted to lose weight, what would be a reasonable goal for you over a two-month period? (i.e., how many lbs. could you lose over 2 months?) _____ lbs.

7. Some people, no matter what they do, find it easy to lose weight. Others, even when they do all they can, find it very difficult to lose weight. We would like to know how easy or difficult it is for you to lose weight.

   For me to lose weight it is
   
   difficult:_____:_____:_____:_____:_____:
   easy:____

* Questionnaire items used to compute weight and diet history score.
INSTRUCTIONS

The purpose of the following questions is to measure the attitudes various people have toward weight reduction. In answering the following questions, please make your judgments on the basis of your own feelings. On the following pages you will find various statements to be judged and beneath each, a scale or a set of scales. You are to rate each statement on each of the scale(s) following the statement.

Here is how you are to use these scales:

If you feel that the statement above the scale is very closely related to one end of the scale, you should place your check-mark as follows:

    good \( \checkmark \):\___:\___:\___:\___:\___:\___: bad

    good \___:\___:\___: or \___:\___:\___: \( \checkmark \): bad

If you feel that the statement above the scale is quite closely related to one or the other end of the scale (but not extremely), you should place your check-mark as follows:

    harmful \___: \( \checkmark \):\___:\___:\___:\___: beneficial

    harmful \___:\___:\___: or \___:\___:\___: \( \checkmark \): beneficial

If the statement seems only slightly related to one side as opposed to the other side (but is not really neutral), then you should place your check-mark as follows:

    foolish \___:\___:\___: \( \checkmark \):\___:\___:\___: wise

    foolish \___:\___:\___: or \___:\___:\___: \( \checkmark \):\___:\___:\___: wise

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the things you are judging.
If you consider the statement to be **neutral** on the scale, both sides of the scale **equally associated** with the statement, or if the scale is **completely irrelevant**, unrelated to the statement, then you should place your check-mark in the middle space:

**pleasant:** ___:___:___: _✓_:___:___:___ **unpleasant**

**IMPORTANT:**
1. Place your check-marks in the middle of spaces, not on the boundaries.

   This
   
   Not This
   

   _✓_:___:___:___:___:___

2. Be sure you check every scale for every statement -- Do not omit any!

3. Never put more than one check-mark on a single scale.
1. Most people who are important to me think
   I should __________________________ I should not adhere to a diet to reduce weight during the next two months.

2. Most people who are important to me think
   I should __________________________ I should not engage in physical activity to reduce weight during the next two months.

3. I intend to really do things to reduce weight for the next two months.
   likely __________________________ unlikely

4. I intend to avoid long periods of inactivity (eg. watching T.V., just sitting around, etc.) for the next two months.
   likely __________________________ unlikely

5. I intend to avoid excessive sleeping or napping during the day (especially after meals) for the next two months.
   likely __________________________ unlikely

6. I intend to walk wherever possible instead of riding the bus, driving a car, or riding an elevator for the next two months.
   likely __________________________ unlikely

7. I intend to do exercises such as jogging, calisthenics, etc., on a regular basis for the next two months.
   likely __________________________ unlikely

8. I intend to participate in sports on a regular basis (eg., swimming, skiing, tennis, skating, bike riding, basketball, etc), for the next two months.
   likely __________________________ unlikely

9. For me to adhere to a diet to reduce weight during the next two months is
   good __________________________ bad
   harmful __________________________ beneficial
   pleasant __________________________ unpleasant
9. For me to adhere to a diet to reduce weight during the next two months is

- convenient ____________ inconvenient
- foolish ______________ wise
- uncomfortable ___________ comfortable
- difficult ______________ easy

10. For me to engage in physical activity to reduce weight during the next two months is.

- good ______________ bad
- harmful ______________ beneficial
- pleasant ______________ unpleasant
- convenient ______________ inconvenient
- foolish ______________ wise
- uncomfortable ____________ comfortable
- difficult ______________ easy

11. For me to reduce weight during the next two months is

- good ______________ bad
- harmful ______________ beneficial
- pleasant ______________ unpleasant
- convenient ______________ inconvenient
- foolish ______________ wise
- uncomfortable ____________ comfortable
- difficult ______________ easy
12. For me to avoid snacking between meals and in the evenings for the next two months is

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13. For me to cut down on all starchy foods (eg. sweets, bread, potatoes, etc.) for the next two months is

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14. For me to avoid being in places where I might be tempted to eat starchy foods and/or eat too much (eg. restaurants, bakeries, coffee-shops, etc.) for the next two months is

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15. For me to decrease my food intake, in general, by eating lighter meals, not having seconds, and not overeating for the next two months is

- good: ______:____:____:____ bad: ______:____:____:____
- harmful: ______:____:____:____ beneficial: ______:____:____:____
- pleasant: ______:____:____:____ unpleasant: ______:____:____:____
- convenient: ______:____:____:____ inconvenient: ______:____:____:____
- foolish: ______:____:____:____ wise: ______:____:____:____
- uncomfortable: ______:____:____:____ comfortable: ______:____:____:____
- difficult: ______:____:____:____ easy: ______:____:____:____

16. For me to maintain a balanced diet by eating all the essential nutrients for the next two months is

- good: ______:____:____:____ bad: ______:____:____:____
- harmful: ______:____:____:____ beneficial: ______:____:____:____
- pleasant: ______:____:____:____ unpleasant: ______:____:____:____
- convenient: ______:____:____:____ inconvenient: ______:____:____:____
- foolish: ______:____:____:____ wise: ______:____:____:____
- uncomfortable: ______:____:____:____ comfortable: ______:____:____:____
- difficult: ______:____:____:____ easy: ______:____:____:____

17. For me to eat on a consistent and regular schedule for the next two months is

- good: ______:____:____:____ bad: ______:____:____:____
- harmful: ______:____:____:____ beneficial: ______:____:____:____
- pleasant: ______:____:____:____ unpleasant: ______:____:____:____
- convenient: ______:____:____:____ inconvenient: ______:____:____:____
- foolish: ______:____:____:____ wise: ______:____:____:____
- uncomfortable: ______:____:____:____ comfortable: ______:____:____:____
- difficult: ______:____:____:____ easy: ______:____:____:____
18. For me to keep to a minimum drinking of any alcoholic beverages for the next two months is

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19. For me to really do things to reduce weight for the next two months is

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20. Most people who are important to me think

I should ___:____:____:____:____:____:____ I should not avoid long periods of inactivity (eg. watching T.V., just sitting around, etc.) for the next two months.

21. Most people who are important to me think

I should ___:____:____:____:____:____:____ I should not avoid excessive sleeping or napping during the day time (especially after meals) for the next two months.

22. Most people who are important to me think

I should ___:____:____:____:____:____:____ I should not walk wherever possible instead of riding the bus, driving a car, or riding an elevator for the next two months.
23. Most people who are important to me think
   I should __:____:____:____:____:____:____ I should not
do exercises such as jogging, calisthenics, etc., on a regular
basis for the next two months.

24. Most people who are important to me think
   I should __:____:____:____:____:____:____ I should not
participate in sports on a regular basis (eg. swimming, skiing,
tennis, skating, bike riding, basketball, etc.) for the next two
months.

25. I intend to avoid snacking between meals and in the evenings for
   the next two months.
   likely __:____:____:____:____:____:____ unlikely

26. I intend to cut down on all starchy foods (eg. sweets, bread,
potatoes, etc.) for the next two months.
   likely __:____:____:____:____:____:____ unlikely

27. I intend to avoid being in places where I might be tempted to eat
   starchy foods and/or eat too much (eg. restaurants, bakeries,
   coffee-shops, etc.) for the next two months.
   likely __:____:____:____:____:____:____ unlikely

28. I intend to decrease my food intake, in general, by eating lighter
   meals, not having seconds, and not overeating for the next two
   months.
   likely __:____:____:____:____:____:____ unlikely

29. I intend to maintain a balanced diet by eating all the essential
   nutrients for the next two months.
   likely __:____:____:____:____:____:____ unlikely

30. I intend to eat on a consistent and regular schedule for the next
two months.
   likely __:____:____:____:____:____:____ unlikely

31. I intend to keep a minimum drinking of any alcoholic beverages
   for the next two months.
   likely __:____:____:____:____:____:____ unlikely
32. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not really do things to reduce weight for the next two months.

33. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not avoid snacking between meals and in the evenings for the next two months.

34. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not cut down on all starchy foods (eg. sweets, bread, potatoes, etc.) for the next two months.

35. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not avoid being in places where I might be tempted to eat starchy foods and/or eat too much (eg. restaurants, bakeries, coffee-shops, etc.) for the next two months.

36. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not decrease my food intake, in general, by eating lighter meals, not having seconds, and not overeating for the next two months.

37. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not maintain a balanced diet by eating all the essential nutrients for the next two months.

38. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not eat on a consistent and regular schedule for the next two months.

39. Most people who are important to me think
   I should _____:_____:_____:_____:_____:_____ I should not keep to a minimum drinking of any alcoholic beverages for the next two months.
40. Most people who are important to me think

I should ___:___:___:___:___:___:___ I should not reduce weight during the next two months.

41. For me to avoid long periods of inactivity (eg. watching T.V., just sitting around, etc.) for the next two months is

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bad
beneficial
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42. For me to avoid excessive sleeping or napping during the daytime (especially after meals) for the next two months is

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43. For me to walk wherever possible instead of riding the bus, driving a car, or riding an elevator for the next two months is

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43. For me to walk wherever possible instead of riding the bus, driving a car, or riding an elevator for the next two months is

- foolish ________________ wise
- uncomfortable ________________ comfortable
- difficult ________________ easy

44. For me to do exercises such as jogging, calisthenics, etc, on a regular basis for the next two months is

- good ________________ bad
- harmful ________________ beneficial
- pleasant ________________ unpleasant
- convenient ________________ inconvenient
- foolish ________________ wise
- uncomfortable ________________ comfortable
- difficult ________________ easy

45. For me to participate in sports on a regular basis (eg. swimming, skiing, tennis, skating, bike riding, basketball, etc.) for the next two months is

- good ________________ bad
- harmful ________________ beneficial
- pleasant ________________ unpleasant
- convenient ________________ inconvenient
- foolish ________________ wise
- uncomfortable ________________ comfortable
- difficult ________________ easy
46. I intend to reduce weight during the next two months.
   likely ______:____:____:____:____:____:____ unlikely

47. I intend to adhere to a diet to reduce weight during the next two months.
   likely ______:____:____:____:____:____:____ unlikely

48. I intend to engage in physical activity to reduce weight during the next two months.
   likely ______:____:____:____:____:____:____ unlikely

49. Eating is
   good ______:____:____:____:____:____:____ bad
   harmful ______:____:____:____:____:____:____ beneficial
   pleasant ______:____:____:____:____:____:____ unpleasant
   convenient ______:____:____:____:____:____:____ inconvenient
   foolish ______:____:____:____:____:____:____ wise
   uncomfortable ______:____:____:____:____:____:____ comfortable
   difficult ______:____:____:____:____:____:____ easy

50. The thin me is
   good ______:____:____:____:____:____:____ bad
   harmful ______:____:____:____:____:____:____ beneficial
   pleasant ______:____:____:____:____:____:____ unpleasant
   convenient ______:____:____:____:____:____:____ inconvenient
   foolish ______:____:____:____:____:____:____ wise
   uncomfortable ______:____:____:____:____:____:____ comfortable
   difficult ______:____:____:____:____:____:____ easy
51. The fat me is

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52. Going out on dates is

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53. The Me right now is

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QUESTIONNAIRE 2

Initials: __________

Sex: _____ Male
      _____ Female

Listed below are a series of statements with which some people agree and other disagree. Evidence can be advanced in favor of each statement, and against each statement.

Please indicate the extent to which you agree or disagree with a statement by placing a checkmark or X in one of the spaces on the line below the statement. Please don't skip any statements if you don't have much feeling one way or the other.

1. Children get into trouble because their parents punish them too much.
   Agree _____:_____:_____:_____:_____:_____:_____ Disagree

2. The trouble with most children nowadays is that their parents are too easy with them.
   Agree _____:_____:_____:_____:_____:_____:_____ Disagree

3. Many of the unhappy things in people's lives are partly due to bad luck.
   Agree _____:_____:_____:_____:_____:_____:_____ Disagree

4. People's misfortunes result from the mistakes they make.
   Agree _____:_____:_____:_____:_____:_____:_____ Disagree

5. One of the major reasons why we have wars is because people don't take enough interest in politics.
   Agree _____:_____:_____:_____:_____:_____:_____ Disagree

6. There will always be wars, no matter how hard people try to prevent them.
   Agree _____:_____:_____:_____:_____:_____:_____ Disagree
7. In the long run, people get the respect they deserve in this world.

   Agree ___:____:____:____:____:____:____:____:____:____: Disagree

8. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

   Agree ___:____:____:____:____:____:____:____:____:____: Disagree

9. The idea that teachers are unfair to students is nonsense.

   Agree ___:____:____:____:____:____:____:____:____:____: Disagree

10. Most students don't realize the extent to which their grades are influenced by accidental happenings.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree

11. Without the right breaks, one cannot be an effective leader.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree

12. Capable people who fail to become leaders have not taken advantage of their opportunities.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree

13. No matter how hard you try some people just don't like you.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree

14. People who can't get others to like them don't understand how to get along with others.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree

15. I have found that what is going to happen will happen.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree

16. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree

17. In the case of the well prepared student there is rarely, if ever, such a thing as an unfair test.

    Agree ___:____:____:____:____:____:____:____:____:____: Disagree
18. Many times exam questions tend to be so unrelated to course work that studying is really useless.
   Agree _____:_____:_____:_____:_____:_____ Disagree

19. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
   Agree _____:_____:_____:_____:_____:_____ Disagree

20. Getting a good job depends mainly on being in the right place at the right time.
   Agree _____:_____:_____:_____:_____:_____ Disagree

21. The average citizen can have an influence in government decisions.
    Agree _____:_____:_____:_____:_____:_____ Disagree

22. This world is run by the few people in power, and there is not much the little guy can do about it.
    Agree _____:_____:_____:_____:_____:_____ Disagree

23. When I make plans, I am almost certain that I can make them work.
    Agree _____:_____:_____:_____:_____:_____ Disagree

24. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
    Agree _____:_____:_____:_____:_____:_____ Disagree

25. In my case, getting what I want has little or nothing to do with luck.
    Agree _____:_____:_____:_____:_____:_____ Disagree

26. Many times we might just as well decide what to do by flipping a coin.
    Agree _____:_____:_____:_____:_____:_____ Disagree

27. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
    Agree _____:_____:_____:_____:_____:_____ Disagree
28. Getting people to do the right thing depends upon ability: luck has little or nothing to do with it.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

29. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

30. By taking an active part in political and social affairs, the people can control world events.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

31. Most people don't realize the extent to which their lives are controlled by accidental happenings.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

32. There really is no such thing as "luck".

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

33. It is hard to know whether or not a person really likes you.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

34. How many friends you have depends upon how nice a person you are.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

35. In the long run, the bad things that happen to us are balanced by the good ones.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

36. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

37. With enough effort we can wipe out political corruption.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree

38. It is difficult for people to have much control over the things politicians do in office.

Agree _______ : _______ : _______ : _______ : _______ : _______ Disagree
39. Sometimes I can't understand how teachers arrive at the grades they give.
   Agree ______:____:____:____:____:____:____:____: Disagree

40. There is a direct connection between how hard I study and the grades I get.
   Agree ______:____:____:____:____:____:____:____: Disagree

41. Many times I feel that I have little influence over the things that happen to me.
   Agree ______:____:____:____:____:____:____:____: Disagree

42. It is impossible for me to believe that chance or luck plays an important role in my life.
   Agree ______:____:____:____:____:____:____:____: Disagree

43. People are lonely because they don't try to be friendly.
   Agree ______:____:____:____:____:____:____:____: Disagree

44. There's not much use in trying too hard to please people; if they like you, they like you.
   Agree ______:____:____:____:____:____:____:____: Disagree

45. What happens to me is my own doing.
   Agree ______:____:____:____:____:____:____:____: Disagree

46. Sometimes I feel that I don't have enough control over the direction my life is taking.
   Agree ______:____:____:____:____:____:____:____: Disagree

47. Most of the time I can't understand why politicians behave the way they do.
   Agree ______:____:____:____:____:____:____:____: Disagree

48. In the long run, people are responsible for bad government on a national as well as on a local level.
   Agree ______:____:____:____:____:____:____:____: Disagree
QUESTIONNAIRE 3

Attached are eight questionnaires. We would like you to complete these questionnaires, one every weekend, over the next two months. The purpose of these questionnaires is for us to obtain measures of your behavior. In order for us to obtain valid information, be sure that you complete one questionnaire every weekend, and that you answer the questions honestly.

We will ask you to bring the completed questionnaires when we contact you sometime during the next two months. If you have any questions contact Dorothy Sejwacz, Tobin 626 or call 665-3285.
Date on which questionnaire completed

Please indicate the extent to which you engaged in each of the following behaviors over the past week by using the scale below each statement.

1. I avoided long periods of inactivity (eg. watching T.V., just sitting around, etc.)
   All the time ______________ never

2. I avoided excessive sleeping or napping during the day time (especially after meals).
   All the time ______________ never

3. I walked wherever possible instead of riding the bus, driving a car, or riding an elevator.
   All the time ______________ never

4. I did exercise such as jogging, calisthenics, etc, on a regular basis.
   All the time ______________ never

5. I participated in sports on a regular basis (eg. swimming, skiing, tennis, skating, bike riding, basketball, etc.).
   All the time ______________ never

6. I avoided snacking between meals and in the evenings.
   All the time ______________ never

7. I cut down on all starchy foods (eg. sweets, bread, potatoes, etc.)
   All the time ______________ never

8. I avoided being in places where I might be tempted to eat starchy foods and/or eat too much (eg. restaurants, bakeries, coffee-shops, etc.).
   All the time ______________ never

9. I decreased my food intake, in general, by eating lighter meals, not having seconds, and not overeating.
   All the time ______________ never
10. I maintained a balanced diet by eating all the essential nutrients. All the time ____:____:____:____:____:____:____ never

11. I ate on a consistent and regular schedule. All the time ____:____:____:____:____:____:____ never

12. I kept to a minimum drinking of any alcoholic beverages. All the time ____:____:____:____:____:____:____ never