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SELF-MANAGEMENT TRAINING WITH PRESERVICE PHYSICAL EDUCATION TEACHERS.

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SELF-MANAGEMENT TRAINING WITH PRESERVICE PHYSICAL EDUCATION TEACHERS

DISSERTATION

Presented in Partial Fulfillment of the Requirement for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By
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The Ohio State University
1976

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Approved By
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DEDICATION

This dissertation is dedicated to my loving Mother in memory of my Father, my inspiration.
ACKNOWLEDGMENTS

A dissertation represents a synthesis of inspiration and perseverance, as well as a confluence of mind and insight. It is not the work of a single individual, but the result of the support and encouragement of many people. This study is dedicated to each and every person who has contributed to the learning environment within which I have grown and will continue to grow.

I especially acknowledge the support of Dr. Charles Mand, my adviser and friend. He gave me the freedom to pursue my doctoral work in a personal way and stood by me throughout my trials and tribulations. For this, I am truly thankful.

Special thanks are extended to Dr. Daryl Siedentop, who has given his graduate students an exemplary model of the "teacher educator." He provided the impetus for this study, as well as a continued interest in my doctoral work.

My appreciation also goes to Dr. William Heward, whose critical analysis enhanced the final product of this doctoral study.

Thanks are also given to the fifteen undergraduate physical education majors who served as subjects in this study. Without their cooperation, this study would not have been completed.

And last, but not least, I would like to thank my fellow graduate students, who put up with my complaints, listened to my seemingly endless discourse, had the good sense to ignore my "ups and downs," but who were always there to brighten up my spirits.
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CHAPTER I

INTRODUCTION

The behavior of a person who has calculated his chances, compared alternatives, or considered the consequences of a move is different from, and usually more effective than, the behavior of one who has merely been exposed to the unanalyzed contingencies [Skinner, 1969, pp. 121-122].

Man realized quite some time ago that it is easier to comprehend the objective world than the subjective, easier to control nature than himself. And, with some surprise, he succeeded almost beyond his dreams in shaping nature to his wishes. He became the master of his own fate, that is, until the society he spawned reversed the position of dependence and now threatens to annihilate him in a more ironic way. Instead of controlling his own behavior, he has become the victim of what many feel are excessive environmental controls resulting from the accelerative thrusts of rapidly changing environments. The increased interest in recent years on the importance of self-management seems to have paralleled the situation where man is becoming more and more concerned about the dangers of external control [Skinner, 1971]. The conspicuousness of manipulative or coercive efforts by external agencies to undermine self-determination is apparently threatening to man's perceptions of individual freedom. While some will argue that freedom is an illusion or myth invented by man to make sense of his experience, it
Illusions...have consequences, and as the research evidence...indicates, the loss of the illusion of freedom may have untoward consequences for the way men live [Lefcourt, 1973, p. 417].

When a person believes there is no behavior in his repertoire which will allow him to be effective in securing his goals, he is likely to see no relationship between any effort on his part and the end results in a particular situation [Rotter, 1954]. When man experiences a loss of control over his own destiny or perceives a loss of control, his quality of living may be severely altered. London [1969] reflects on the necessity of restoring some semblance of individual freedom.

In order to defend individual freedom, it is necessary to enhance the power of individuals. If behavior technology endangers freedom by giving refined powers to controllers, then the antidote which promotes freedom is to give more refined powers over their own behavior to those who are endangered. Since everyone is endangered, this means facilitating self-control in everyone [pp. 213-214].

Many of the social problems facing nations today and the current drive for more citizen participation stem from the experience of lack of power among many persons. Powerlessness results in hopelessness, fatalism, and/or mass apathy. It seems apparent that our current state of affairs calls for a reconsideration of the role that individual self-determination plays in the survival of man and of society. Kanfer [1972] emphasizes the necessity of a reappraisal of self-regulation.

It is believed that the rapid rate of changes in life settings associated with sociological, cultural, and technological innovations and experimentation calls for...a reconsideration of the entire concept of adjustment and the relevance of self-regulation as a process that orders individual behavior in the social surroundings [p. 205].

We are undergoing changes in every aspect of our society, and man must be able to deal independently with critical situations that confront him daily. He must learn to live effectively in a technological society in which conflicting environmental forces continually vie for his control. He must become aware of those forces and learn effective countercontrol measures in order to manage his life successfully. He must become a personal scientist skilled in calculating his own behavior and its consequences. Thus, self-management is probably man's most potent strategy for understanding and controlling the important events occurring in his life space.

Self-regulation is necessary, not only for the survival of the individual, but also for the efficient functioning of society. Mahoney and Thoresen [1974] note the importance of self-management in their recent book SELF-CONTROL: POWER TO THE PERSON.

We value self-control because of its role in the survival of our society and culture. One measure of a "civilized" society is the degree to which its inhabitants direct, maintain, and coordinate their activities without external coercion. If more individuals could develop effective self-management skills, the need for professional helpers and the number of passive "you help me" patients might be sharply diminished [p. 1].

This tone of self-management appears to be consistent with our society's ethic of social and self-responsibility. If we are in control of our behavior, we are held responsible for our behavior.
The notion that man can change himself, be his own change agent, has been somewhat unfashionable among psychologists for many years. In fact, the greatest skepticism regarding man's capacity for self-change is found among those who subscribe to either a strict environmental or biological determinism. Mahoney [1974] suggests that man is not inevitably a "captive" of his environment or of his heredity. He emphasizes man's capacity for self-directed behavior change and suggests that psychologists and others in helping professions should share their scientific commitments with their clientele.

We should strive to provide our clients with the same technical skills we employ as researchers in approaching and resolving problematic situations. That is, we should share our commitment to empiricism and view therapy [self-improvement] as an apprenticeship designed to train personal scientists --individuals who are skillful in the functional analysis and systematic improvement of their own behavior. We should model and teach an "intimate empiricism" replete with skills training in problem analysis, hypothesis generation, evaluative experimental action, and so on [p. 274].

One of the most significant features of contemporary research and therapy is the development of self-management procedures that promise man greater mastery over his own life. If, in our thinking of enhancing the power of the individual over his own life, we begin to view self-management as a self-science, we should consider the role of education in preparing individuals to be their own "behavior modifiers" or "personal scientists." Traditionally, teachers are among those who have been skeptical of the individual's ability to direct and control his own behaviors. The increasing incidence of disruptive behavior in the classroom reflects an educational neglect
of skills needed for self-management. With increasing recognition by educators that sizeable numbers of school children evidence faulty emotional and/or behavioral control, major efforts are currently underway to provide special programs and resources for the development of requisite social skills, including self-control. Glaser [1972] recognizes the importance of presenting educational alternatives which enhance the ability of the individual for self-regulation. He feels that children can learn to modify their own environments for learning if they are taught self-management and problem-solving skills.

The challenge is clear. If children are to be taught self-management skills, it will no doubt be accomplished by parents and teachers who model and teach self-management techniques. Because teachers are in a constant social exchange with their students, the importance of their interactions with them cannot be over-emphasized. If teachers are to help students grow and find satisfaction in the progressive development of competencies, they will need to be personally competent individuals skilled in managing their own lives successfully. Undergraduate professional preparation programs are replete with courses in developing technical skills in prospective teachers, but, until recently, little attention has been focused on the development of personal skills. Rarely is a teacher education curriculum designed to help students deal in personal problems of human conduct. "Know Thyself," the motto inscribed on the Oracle of Delphi in the classical world of ancient Greece, is an injunction which has been largely forgotten by society and almost completely ignored by teacher educators. Even though educators have recognized
for some time the importance of the human dimension in teaching, few teacher educators have systematically addressed the problem of the personal development of their teachers in training.

There is a growing body of research [Fuller, 1969] suggesting that traditional teacher preparation programs do little to satisfy the personal concerns of their increasingly frustrated and alienated clientele.

Becoming a teacher is complex, stressful, intimate, and largely covert, but in accomplishing this demanding task, teachers do not feel helped by teacher education. [Fuller and Brown, 1975, p. 25].

Weinstein [1971] suggests that, in addition to technical skills, teacher training should focus on self-knowledge or self-science which is largely personal in nature. Murray [1972] feels that teachers who will ultimately make the most significant differences will be more than competent technicians. They will know something about themselves and will possess interpersonal competencies which will allow them to solve a variety of personal problems.

The implicit message in the preceding paragraph is that teacher training must become concerned with developing persons who are skilled in being human. Teachers need skills that will allow them to behave in personally competent ways. Teacher educators who regard themselves as behavioral humanists are interested in the development of personally competent individuals who engage in productive, self-rewarding behaviors. This perspective is held by an increasing number of teacher educators who feel that students can be helped to become personally competent. Thoresen [1974] suggests that,
We must prepare teachers who can behave as personally competent human beings--who can be instrumental in fostering the comprehensive growth of students as individuals [p. 213].

It is assumed that the personally competent teacher possesses unique behavioral dispositions, and any attempt to find commonality in uniqueness is by definition doomed to failure from the very beginning. However, it should be possible to identify some generic personal skills which enhance the effectiveness of the teaching-learning process without undermining the idiosyncratic behaviors which enable individual teachers to enact their teaching roles in personal ways. There is little doubt that once identified and operationalized, personal competence can be learned. The significance of this statement lies in the fact that learned behavior can be modified.

Many concerns of pre-service teachers center around what have been termed "survival skills" [Fuller and Brown, 1975]. One of these survival skills is the ability to control the important events occurring in their lives. It is apparent from the complaints voiced by students that teacher training does little to prepare the prospective teachers to use problem-solving strategies to deal effectively with personal and classroom problems. Travers [1975], in a recent article, suggests that the "research evidence indirectly supports the contention that an important component of effective teaching is productive problem-solving on the part of the teacher" [p. 419]. Modern classrooms are so complex in terms of interpersonal problems that teachers need more than pre-determined responses to problems.

In good examples of modern classrooms, very little stereotyped behavior is evident...There is little Victorian modular teacher behavior evident,
and this is because the role of the teacher is that of being a productive problem solver [Travers, 1975, p. 419].

Behavioral self-management is a productive approach to problem-solving. It is a process which requires an intense focus on the self in order to enhance self-knowledge. The behavioral approach to self-management involves the "identification and control of specific environmental events that affect specific behaviors" [Williams and Long, 1975, p. 4]. In light of the concerns of pre-service teachers, behavioral self-management offers the most systematic approach to the training of teachers to deal effectively with the complex personal problems they encounter. It is apparent from the current attention that self-management is receiving from the social scientific disciplines that it represents an exciting excursion into territory that holds important practical implications for those in the helping professions. It is within this perspective that the present study was conceived.

Statement of the Problem

The purpose of this study is two-fold:

1. To determine the usefulness of a course in self-management training with volunteer physical education majors.

2. To determine the ability of pre-service physical education majors enrolled in the course to apply elementary principles of behavior to the management of their own behavior.
Analysis

Each subject in this study was enrolled in a nine-week self-management course in which behavioral self-management and elementary principles of behavior analysis were examined and studied. In addition, each subject conducted a personal research project which required him to apply behavior principles to a problem behavior which he chose to modify. Single organism designs in which the subjects collected baseline data on themselves and then applied self-management techniques in order to change target behaviors were employed. Single organism or N=1 designs are used quite often in self-management research when all of the experimental manipulations and observations are made on the same subject. The single subject, or within-subject, design allows intensive study of a small number of subjects to determine the effects of different experimental conditions upon the subject(s). Usually, data are graphed to determine whether there were differences between the various experimental conditions. Three within-subject designs were used by the subjects in this study: (1) multiple baseline; (2) reversal; or (3) changing criterion.

When data were collected for a particular behavior across two or more subjects, a multiple baseline design was employed. With this kind of design, causality is demonstrated when behaviors change relative to the time-sequenced application of experimental contingencies. A reversal design was used by subjects when only one subject comprised the sample and when the purpose was to demonstrate a functional relationship between a behavior and an experimental condition.
With a reversal design, the experimental condition is applied and temporarily withdrawn at some point in time. Causality inferences can be made when behavior changes systematically as a result of altering the experimental contingencies. When a subject chose to modify a behavior which should be shaped gradually over a period of time, a changing criterion design was chosen as the most appropriate one. With this type of design, causality is demonstrated when behavior changes to match a changing criterion for reinforcement or punishment. In the beginning of the program, the criterion is relatively lenient; however, as performance consistently meets the criterion, it is made more stringent.

**Delimitations**

The subjects in this study were volunteer sophomore physical education majors enrolled in their first of a sequence of professional physical education courses dealing with teaching behavior. Before they elected to participate in the study, they were provided information regarding the purpose of the course, as well as what they could expect to gain from taking the course. Thus, it was assumed that those enrolled had some desire to change at least some of their behaviors.

Although self-management has proven effective with a wide variety of behaviors, it is not assumed that all behaviors are subject to self-management. Some behaviors may be controlled primarily by biological factors and/or by environmental variables over which the individual has little control. Genetic endowment, physiological injury,
and societal constraints may profoundly limit one's behavioral potential. The self-management techniques employed in this study are not applicable to every problem encountered by all people across all settings. The focus of this study was the individual person and how he could control his own behavior by systematically employing a variety of self-management techniques.

Limitations of the Study

This study was limited by the following factors:

1. The reliability of self-observation data, especially that dealing with covert behaviors, is difficult to obtain. Every attempt was made by the instructor to set the occasion for the reliable collection of self-data. Weekly checks of the data were made by the instructor.

2. Self-management research does not always lend itself to experimental analysis. The primary purpose of this study was to obtain change. The demonstration of causality was of secondary interest to the investigator. Thus, conventional applied behavior designs were employed where methodological rigor was possible.

3. In self-management research which utilizes a "package intervention," it is not always feasible to determine the relative effectiveness of each component of the package. The subjects in this study implemented several intervention techniques simultaneously; thus, it was not possible to "parcel out" the effects of each treatment component.

4. The ultimate success of a self-management program cannot be ascertained during the course of a dissertation. The generalization of self-management skills across time, situations, and behaviors is the only valid measure of the individual's ability to maintain behavior control.
Research Hypotheses

1. Each student will be able to design, with the instructor's assistance, and successfully implement a self-management research project.

2. An understanding of behavior principles will facilitate the student's ability to successfully implement a self-management project.

Basic Assumptions

The following are assumed to be true and relevant to this study:

1. The subjects in this study will be honest and reliable in their personal data collection.

2. The subjects in this study enrolled in the course because they want to change some aspect(s) of their behavior.

3. Self-observation may be a reactive event. That is, observing one's own behavior is likely to result in a behavior change; thus, a stable baseline involving self-observation will be difficult to achieve.

4. An intervention package (multiple independent variables implemented simultaneously) will have to be treated as one independent variable. The effects of each aspect of the package will not be determined in this study.

5. True reversal designs are inappropriate for most kinds of self-management research. Generalization of self-management skills across time and situations is the most effective way of demonstrating the effectiveness of a self-management project.

6. Changing criterion designs are the most appropriate designs for self-management research which requires the careful shaping of behaviors over a period of time.

7. Multiple baseline designs are appropriate when two or more individuals are attempting to change the
same behaviors using the same intervention techniques.

Definitions

The following words or phrases have been defined because they may have a variety of interpretations or because they may be scientific terms that are not in common use by the average reader.

Antecedent Behaviors: Events (responses) which occur before other behaviors and eventually become part of a chain of behaviors.

Attitude: Covert behavioral pre-disposition.

Baseline: The frequency that behavior is performed prior to initiating an intervention phase.

Behavior-Environment Relationship: The reciprocal interaction between the environment and an individual's behavior.

Behavior Modification: The control of behavior via the manipulation of antecedent and consequent events.

Behavioral Control: Exerting power or influence over others or self by altering the environmental contingencies to achieve a definite end [Kazdin, 1975].

Behavioral Goal: The results one seeks to achieve using a behavior management plan [Williams and Long, 1975].

Chain: A sequence of behaviors that occurs in a fixed order. Each behavior in the chain serves as a discriminative stimulus for the next response [Kazdin, 1975].

Changing-Criterion Design: An experimental design in which the effect of the program is evaluated by repeatedly altering the criteria for reinforcement or punishment [Kazdin, 1975].

Consequence Behaviors: Events (responses) which follow other behaviors and eventually become part of a chain of behaviors.
Contingency: The relationship between behaviors and their consequences.

Contingency Contract: A behavior modification program in which an agreement or contract which specifies the relationship between behavior and its consequences is made between individuals [Kazdin, 1975].

Covert Behaviors: Private behaviors, i.e., thoughts, feelings, emotions, self-verbalizations.

Covert Control: The use of private behaviors to regulate other covert or overt behaviors.

Cue: Discriminative stimulus.

Discriminative Stimulus: An antecedent event or stimulus which signals that a certain response will be reinforced [Kazdin, 1975].

Elicit: To automatically bring about a response [Kazdin, 1975].

Emit: To perform a response spontaneously; an emitted response is not automatically controlled by stimuli which precede it [Kazdin, 1975].

Freedom: The condition of having available a number of response options in controlling one's own behavior [Thoresen and Mahoney, 1974].

Generalization: Transfer of a trained response to situations or stimulus conditions other than those in which training has taken place [Kazdin, 1975].

High-Probability Behavior: A behavior in which an individual frequently engages when there are no external consequences for engaging in that behavior [Williams and Long, 1975].

Idiographic Research: Study of few individuals in a controlled setting.

Imagery: Mental pictures.

Incompatible Behavior: Behavior that cannot be performed at the same time as or interferes with another behavior [Kazdin, 1975].

Internal Symbolic Control: Control of overt behavior via self-generated covert responses.
Modeling: Learning by observing another individual engage in a behavior.

Multiple Baseline Design: An experimental design which demonstrates the effect of a contingency by introducing the contingency across different behaviors, individuals, or situations at different points in time [Kazdin, 1975].

"Naturally Occurring" Reinforcers: Those reinforcing events in the environment which are not contrived but are usually available as part of the setting [Kazdin, 1975].

Operant: An emitted observable behavior that is controlled by its consequences.

Process Assessment: Assessment of behaviors (e.g., snacking, socializing) that are contributing to a behavior product (e.g., overweight, incomplete academic assignments) [Williams and Long, 1975].

Product Assessment: Examining the results of behavior to verify the effectiveness of self-management [Williams and Long, 1975].

Prompt: An antecedent event which helps initiate a response [Kazdin, 1975].

Punishment: Any stimulus which weakens the behavior that it follows.

Reinforcement: Any stimulus which strengthens the behavior that it follows.

Reliability of Assessment: The consistency with which different observers working independently score a target response [Kazdin, 1975].

Response-Cost: A punishment procedure in which a positive reinforcer is lost or some penalty is invoked contingent upon behavior [Kazdin, 1975].

Response-Maintenance: The degree to which behavior is maintained when a behavior modification program is withdrawn.

Reversal Design: An experimental design in which the target behavior of a subject or group of subjects is affected by applying, withdrawing, and re-applying a contingency [Kazdin, 1975].
Self-Control: The use of particular intervention strategies by an individual to alter the relative probability of a set of behaviors, i.e., changing high probability behaviors to low probability behaviors or vice versa.

Self-Evaluation: Appraisal of personal behaviors based on a criterion or standard of performance.

Self-Instruction: A self-management technique in which an individual prompts his or her own behavior by providing covert statements which direct or guide performance [Kazdin, 1975].

Self-Management: (Also self-regulation, self-modification, self-direction.) A process through which an individual becomes the principle agent in guiding, directing, and regulating those features of his own behavior that might eventually lead to desired positive consequences and self-selected outcomes.

Self-Observation: The systematic monitoring and collection of personal data.

Self-Punishment: Self-administration of punishing consequences.

Self-Reinforcement: Self-administration of reinforcing consequences.

Self-Reward: Self-administered positive reinforcement.

Shaping: Developing a new behavior by reinforcing successive approximations toward the terminal response [Kazdin, 1975].

Stimulus Control: A strategy for controlling behavior by altering the stimuli that precipitate behavior [Williams and Long, 1975].

Stimulus Narrowing: Reducing the number of stimuli which are controlling a particular response.

Successive Approximations: Responses which increasingly resemble the terminal behavior which is being shaped [Kazdin, 1975].

Target Behavior: The behavior to be assessed and altered via a self-management program.
Will Power: The manipulation of conditions that will produce a given behavior [Williams and Long, 1975].
CHAPTER II

REVIEW OF RELATED LITERATURE

Many confusions abound regarding the meaning of behavioral self-management because of the use of various terms in the literature to refer to the same operation—namely, self-control, self-regulation, self-modification, etc. For the purpose of this study, self-management has been chosen as the appropriate term and will be used as a generic term to refer to any deliberate response made by an organism to change or maintain his own behavior. Self-management will be viewed as a process through which an individual becomes the principle agent in guiding, directing, and regulating those features of his own behavior that might eventually lead to self-selected goals and outcomes.

The systematic application of principles of behavior analysis by the individual to regulate his own behavior in educational settings has not been well documented. Despite the paucity of research related to this area, there are studies which have examined behavioral self-management in therapeutic environments. These studies have relevance because the principles and techniques employed are applicable in educational situations. The following review of literature will first examine the theoretical basis of behavioral self-management and then focus on three major categories of empirical research in this area:
(1) Self-Observation; (2) Self-Reinforcement; and (3) Covert Self-Control.

**Theoretical Basis of Self-Management**

There are basically two perspectives on self-management. One is the traditional "willpower" conception supported by personality theorists and humanistic psychologists. The other is the behavioral perspective based on a functional relationship between a person's knowledge of controlling factors and his skills in regulating these controls [Thoresen and Mahoney, 1974]. The willpower or trait conception of self-management has not proven very useful in the experimental analysis of self-regulatory processes. Skinner [1953] points out the uselessness of a trait conception of self-management or self-control as an educational device for predicting and modifying behavioral phenomena.

It is of little help to tell a man to use his "willpower" or his "self-control"...An adequate explanation of self-control should make it possible to teach relevant techniques as easily as any other technical repertoire [p. 241].

Thus, the preoccupation of focusing on mystical inner forces as agents of self-management has severely limited the development of sound empirical principles of self-management [Bandura, 1969; Kanfer, 1970; Mahoney and Thoresen, 1974; Skinner, 1953].

Although the first generation of behavior modification methods placed almost exclusive reliance on external intervention via stimulus control or contingent operant reinforcement, self-management has recently emerged as an important dimension of behavior modification.
Recent developments in psychological theory and especially in the application of psychological techniques to the modification of behavior, have sharply highlighted the necessity for a behavioristic model to account for the critical role of self-regulatory mechanisms [Kanfer, 1970, p. 39].

Efforts are currently being made toward the development of a systematic "technology" of behavioral self-management, "a set of procedures that the individual can learn to use in directing and managing his own internal and external actions" [Thoresen and Mahoney, 1974]. The behavioral perspective on self-management is a pragmatic one. The ability to exercise self-control is dependent upon an understanding of the factors that impinge upon an individual's behavior, as well as the ability to exert influence over these forces in a desired manner. The behavioral approach to self-management is basically the same as the approach to external control or control by others. Behaviorists feel that all behavior is stimulus controlled--the difference between self-control and external control depends upon who or what is manipulating which stimuli. Although Skinner [1953] feels that there is no such thing as "true" self-control, he does acknowledge the possibility that man can learn to influence the variables of which his behavior is a function.

Yet to a considerable extent an individual does appear to shape his own destiny. He is often able to do something about the variables affecting him...Some degree of "self-determination" of conduct is usually recognized in the creative behavior of the artist and scientist, in the self-exploratory behavior of the writer, and in the self-discipline of the ascetic. Humbler versions of self-determination are more familiar. The individual "chooses" between alternative courses of action, "thinks through" a problem while isolated from the relevant environment, and guards his health or his position in society through the exercise of "self-control" [p. 228].
There are, however, problems in making the theoretical leap from external or environmental control to self-control. The act of engaging in self-regulated behaviors is a complex process which involves a complicated chain of interdependent behavior-environment influences. There are numerous questions which need to be answered before we can systematically apply laboratory findings to self-management in natural settings. For example, how can we account for the fact that many individuals perform very complex responses over long periods of time when the consequences for such behaviors are either not apparent or tremendously delayed? When an individual is cast in the role of both subject and object of his behavior, how can we explain the reinforcing process by which these self-regulatory behaviors are selectively strengthened? Kanfer [1970] suggests that, 

...behavioristic formulations are not without difficulty because the critical antecedent conditions and even the behavioral components in a self-controlled sequence may lie entirely in the domain of private experience [p. 179].

Mahoney and Thoresen [1974] feel that the patterns of self-management which we observe in a large number of individuals are mediated and maintained through complex cognitive-symbolic processes.

From birth to death, only a very small percentage of a persons' behaviors are publicly observable. Our lives are predominantly composed of private responses to private environments--ranging from monologues in the shower to senile reveries...Symbolic activities not only augment the efficacy of reinforcement operations, but they also are increasingly employed to generate emotional effects that constitute the major reinforcing consequences in behavior modification. Behavior may be sustained by its inherent sensory feedback, by anticipatory outcomes or by self-evaluative consequences [pp. 1, 623-624.
If any field is to advance scientifically, the definitional and theoretical foundations must be clarified. Kanfer [1970, 1971] is one of the few researchers to construct a theoretical model of the self-management process. Although he admits his model is tentative, it does generate some theoretical generalizations which are subject to investigation. Kanfer distinguishes between self-control and self-regulation or self-management in his conceptualization. He defines self-control as "the non-execution of a response in the presence of available reinforcers or the tolerance of aversive stimulation even when an escape response is available" [1970, p. 51]. His theory is based on self-regulation, however, a more comprehensive self-management system which includes self-controlling responses, as well as other instances in which simple adjustments occur, shifting the relative probability of a set of behaviors. Self-regulation involves all those processes by which an individual alters or maintains his behavior in the absence of immediate external supports. Kanfer [1970] comments on the most important aspect of self-regulation.

The critical element of self-regulation is the person's actions toward altering a strong externally determined pattern of present behavior to meet a criterion, often hidden from the observer, that the person has previously set [p. 212].

Kanfer's theoretical model of self-regulation consists of three components: (1) self-monitoring; (2) self-evaluation; and (3) self-reinforcement. According to his position, the first stage begins when one attends to a particular behavior as the result of various sources of input. Ordinarily, behaviors are parts of well-established behavioral chains which individuals do not monitor with any degree of
regularity. However, when these behavioral chains are interrupted, self-monitoring is hypothesized to go into action. Kanfer suggests that some of the following conditions may serve as cues for self-monitoring behaviors.

1. Intervention by others, generally in the form of criticism.
2. Extreme activation levels, high or low.
3. Failure of predicted consequences to occur as a result of one's own behavior.
4. Availability of several different roles or response sets as encountered in most "choice behaviors."
5. Any other times when external or internal events provide cues for which no highly trained response is available [1970, p. 215].

Once the individual is "cued" to monitor a behavior, the self-evaluative process is brought into action. Response feedback in the form of environmental consequences and internal response-produced cues, plus individual history, serve as input stimuli for the evaluative process. The self-evaluation or judgment of the adequacy or appropriateness of a behavior becomes the discriminative stimulus for positive or negative reinforcement. In this model, when the self-evaluation leads the individual to the definition or a problematic behavior, self-control is instituted.

Self-control is viewed as the process that involves the introduction by the individual of supplementary contingencies designed to enable him to alter an ongoing behavioral chain. The antecedents of self-control lie in the discrepancy between self-observation and the performance promise (performance criterion), followed by self-reinforcement aimed at reducing the discrepancy [Kanfer, 1970, pp. 209-211].
In order for this to occur, the individual must temporarily interrupt immediate contingencies and establish ad hoc performance standards to guide his behavior. Kanfer [1971] suggests five mechanisms which are available to individuals for control over problematic behaviors once they are recognized.

1. Establish competing responses with highly reward­ing consequences.

2. Bring the aversive consequences of the tempting response into play prior to the completion of the behavior chain so that an escape response can disrupt the chain.

3. Change the consequences for the tempting response by reduction or delay of positive consequences or by increasing aversive consequences for the tempting response.

4. Change the environment in which the probability for the controlled response is high (stimulus control).

5. Use self-reinforcement to strengthen the above controlling techniques.

Bandura [1969, 1971] has also provided some theoretical basis for the analysis self-management. His primary research emphasis has focused on the role of self-reinforcement in establishing and maintaining self-controlling behaviors.

In his analysis of human behavior, Bandura supports a mediational interpretation of self-management. Behavioral responses are regulated both by external stimulus events and consequences, as well as by symbolic events. He comments on this perspective.

There exists ample evidence that one cannot account satisfactorily for human behavior while remaining entirely outside the organism, because overt behavior is often governed by self-generated stimulus events [1969, p. 39].
Because of a lack of sophisticated instruments which will detect sensitive differences between symbolic events, Bandura feels that most researchers prefer to study behavioral phenomena that can be manipulated by external stimuli. He contends, however, that the individual can be both "agent" and "object" of study of his own behavior.

Persons can not only reliably discriminate internal events, but they can manipulate them by making self-reinforcement contingent upon their occurrence. Furthermore, thought-induced affective reactions may be successfully employed for purposes of controlling one's own overt behavior [1969, p. 40].

Thus, from Bandura's point of view, it appears that people do exercise some degree of control over their own behavior by employing self-generated stimulation. Not only can individuals use self-produced symbolic stimulation to guide their behavior, they can also regulate their own behavior through self-produced consequences. While he does not attempt to minimize the effects of external reinforcement, Bandura feels that since most behavior is controlled and maintained without immediate external reinforcement, this area of self-management must receive additional study. He also emphasizes the necessity of studying the role of symbolic processes in the regulation of human behavior. Finally, he supports a comprehensive theory of self-management which includes three sources of behavioral regulation: (1) stimulus control; (2) internal symbolic control; and (3) outcome control.

Although an individual appears to exert some degree of control over his environment and to shape his own destiny, Skinner [1953]
maintains that there is no such thing as "true" self-control.

When a man controls himself, chooses a course of action, thinks out a solution to a problem, or strives toward an increase in self-knowledge, he is behaving. He controls himself precisely as he would control the behavior of anyone else--through the manipulation of variables of which behavior is a function. His behavior in so doing is a proper object of analysis, and eventually it must be accounted for with variables lying outside the individual himself [pp. 228-229].

Since society is largely responsible for arranging the special contingencies of reinforcement which make the self-controlling responses more probable, the ultimate control appears to be with the environment. Skinner maintains that the difficult task in self-management is not the design of effective self-controlling responses, but in "motivating" the individual to engage in these behaviors. He cautions against assuming that individuals will control their own behavior merely by being given the appropriate self-controlling responses.

Skinner's conception of self-management is primarily one of restraint, of non-execution of undesirable or tempting behaviors when there are conflicting consequences. His notion of self-management involves two kinds of responses with which the individual must be concerned.

1. Controlling Responses -- Those behaviors which impose some degree of restraint upon the behaviors to be controlled or modified, and

2. Controlled Responses -- Those behaviors which are the target behaviors to be controlled or modified.
Although Skinner devotes some attention to private events (internal behaviors) he does not deal with them in his analysis of various self-management techniques. He considers internal events only as they "occur as links in chains of otherwise public events" [p. 229]. Cognitive mediation, symbolic events, and other internal processes are not treated as self-controlling mechanisms by Skinner because they are not immediately available for scientific analysis. In addition, he does not regard them as having "control status" because they do not alter the relationship between an operation of the environment on the behavior of an organism.

The theory and research of Thoresen and Mahoney [1974] have had a tremendous impact on the field of behavioral self-management. Their primary concern is with the development of a technology of self-management whereby individuals can acquire the skills which will enable them to manage their own lives effectively. They suggest that there are three basic steps which are involved in behavioral self-management.

1. The specification of a problematic behavior via systematic self-observation and self-recording.

2. The identification of antecedent cues and environmental consequences.

3. The alteration of some of the antecedents and/or environmental consequences.

Through the process of self-observation and self-recording, the individual becomes aware of those particular antecedent cues which seem to precede the problematic behaviors. As an example, one might discover that his smoking behaviors occur primarily under certain conditions: (1) following a meal; (2) during periods of anxiety; and (3) at social
gatherings where others are smoking. Knowing this information will help him to engineer an environment which does not set the occasion for these behaviors. This same individual might also become aware of various social reinforcers which are maintaining his smoking behaviors. Thus, the whole process of self-observation and self-monitoring enables the individual to become aware of the total conditions affecting his problematic behavior.

Through a process known as "environmental planning," the individual can "prearrange the environment so that either the cues that precede a behavior or the consequences that follow it are changed" [Thoresen and Mahoney, 1974, p. 23]. The prearrangement of stimulus cues, often called stimulus control, was one of the first approaches used in environmental self-management research. Many undesirable behaviors are felt to be directly under the influence of environmental stimuli. The rearrangement of the cues that elicit the undesired or unwanted responses, plus the establishment of new cues that will set the occasion for alternative behaviors, are used together in self-modification. Another environmental planning technique is the prearrangement of response consequences. This usually involves some kind of "contingency contracting" in which there is a formal agreement between an individual and another party who will agree to administer the contingent reinforcement. This technique is not used as often as the prior arrangement of stimulus cues because the necessary social-environmental support is not always accessible to the individual.
Summary

Behavioral self-management is something of an enigma. Perhaps this is true because most of our basic facts, law, principles, and theories are based primarily on research involving external environmental control. At the present time, we know little about internal response-produced stimuli which many suggest is the key to understanding self-regulation. A review of the literature did not reveal a firmly established conceptualization of self-management, although several researchers have related self-control theoretically to external or environmental control. Kanfer's model of self-regulation at least provides us with a heuristic foundation for the speculation of the genesis of self-directed behaviors.

It is apparent from the preceding review that we need improved "working" models, as well as precise theoretical or conceptual models of self-management. Thoresen and Mahoney [1974] are currently working on a technology of self-management which involves a series of specific behaviors that an individual can employ to control his own behavior. Although these self-management techniques have not been subjected to extensive empirical investigation, future research will substantiate their influence. Future empirical research should examine both operant approaches to generalizing self-controlling responses to new environments and techniques for long-term maintenance of commitment to behavioral self-management. Ultimately, this two-stage analysis should result in a model which accounts for two crucial aspects of self-environment:
1. The specification of relevant self-controlling responses or behaviors which can be generalized to changing environments, and

2. The specification of the conditions or situations which initiate and maintain self-modification efforts.

Self-Observation

Most researchers in the area of self-management agree that self-awareness or self-knowledge is the key to a persistent self-managed life style. Research suggests that not only can individuals become more aware of their own behavior by self-observation--they can also affect behavior directly by observing it and recording it. Nesbitt and Valins [1971] suggest in their review of the literature on self-attribute that we learn a great deal about our attitudes and behavioral dispositions from self-observation. Translated into behavioral language, this means that we recognize those internal and external forces which impinge upon our behavior. Through self-observation, we are cued to those antecedent and consequent events which are associated with our behavior. Thus, self-observation appears to serve two functions: (1) it provides systematic personal data; and (2) it is a self-controlling response which affects the behaviors in question.

One of the growing trends in behavioral self-management involves teaching people to become active participants in personal data collection and in the arrangement of optimal conditions for the change process. There are numerous situations in which continuous monitoring and intervention by another individual (therapist, teacher,
counselor, etc) is not feasible. In such instances, self-observation and self-recording of personal, everyday behaviors is more practical. This form of data-collection is not without problems, however. It has been noted in recent studies that there may be "reactive effects" whenever an individual is aware that he is being observed and/or assessed [Moos, 1968]. That is, the subject's awareness of being observed may contaminate his responses. This problem may be even more crucial when the observer and the observed are the same person. When an individual monitors his own behavior, at least some of the behavioral changes noted may be due to the effects of observing one's own behavior [McFall, 1970; Johnson and White, 1971].

At the present time, only preliminary hypotheses have been advanced to explain the reactive effects of self-observation. Kanfer [1970] suggests that self-observation of a behavior has predictable effects on that behavior--it usually causes the focal behavior to change in the desired direction. It should follow from this hypothesis that self-observation of study behaviors will increase these behaviors while self-observation of cigarette smoking will cause a decrease in smoking rate. An extension of Kanfer's hypothesis by Johnson and White [1971] suggests that,

...self-observation of a disapproved behavior [undesirable] should result in a decrease in the frequency of that behavior...further, self-observation of an approved behavior [desirable] should result in an increase in that behavior [p. 489].

These hypotheses are based on the premise that the effects of self-observation may be enhanced both through a manipulation of the value of the observed behavior and an increase in the opportunities for
Homme [1965] feels that self-observation may serve as a cueing function by "reminding" the subject of the observed behavior. He suggests that thinking about a behavior is, in some cases, an approximation of doing it, and that thinking about the behavior will increase the probability of its execution. Although these preliminary hypotheses suggest that self-monitored behaviors will change, and in a predictable fashion, there is little empirical data to substantiate this position.

Few studies have isolated the effects of self-monitoring from other confounding variables. Jeffrey [1974] emphasizes the necessity of deciding how self-observation will be used— as a change agent (independent variable) or as a measurement procedure (dependent variable). If the purpose of self-observation is to collect data, one must be concerned with both the validity and reliability of the measurement, especially if the variables are covert. If self-observation is used as an intervention strategy, it is necessary to select the kind of experimental design that will "separate the relative contribution of self-monitoring from other aspects of the treatment" [Jeffrey, 1974, p. 183].

The majority of the studies employing self-monitoring have not controlled for either validity and reliability, or for the effects of confounding variables. While self-observation has been a common factor in numerous studies, it has rarely been investigated independently. The major portion of the review of empirical research which
follows will focus on studies which have examined self-observation as the major independent variable. Additional studies which have used self-observation in conjunction with other treatment variables will be given minimal attention.

McFall's [1970] study, one of the first of its kind, addressed a crucial issue in self-directed therapeutic programs—the methodological problems associated with collecting data on oneself. His study involved three sub-problems: (1) the effects of self-monitoring on smoking behavior; (2) the differences between self-observing of smoking and non-smoking behaviors; and (3) the accuracy of the self-observations. The results of this study seem to suggest that the observation of an antecedent cue may be a more effective self-change technique than the observation of a consequence. During the self-monitoring phase of the study, the self-observed smokers increased their smoking rates, while those who monitored their decisions not to smoke decreased their rates of smoking. The reliability coefficient for the smoker-observer pairs was .61, which is not regarded as a high co-efficient.

In another study which focused primarily on the effects of self-monitoring, Gottman and McFall [1972] used a multiple time series analysis to study the reactive and therapeutic effects of self-monitoring on specific behaviors of "potential high school dropouts." The present study was a logical extension of the earlier McFall [1970] study since it involved an attempt to replicate the reactive findings of the original study in self-monitoring. The results of their study support the results of the McFall study in terms of the directionality
of the reactive effects of self-monitoring. In general, the subjects increased the behavior that they were monitoring.

Johnson and White [1971] demonstrated the reactive effects of self-observation, using volunteer college students enrolled in an introductory psychology class. The subjects were randomly assigned to one of three observation conditions: (1) self-observation of study behaviors; (2) self-observation of dating behaviors; and (3) a control group. The dependent variable in this study was the final course grade. The results demonstrated that subjects in both experimental groups had significantly higher course grades than the control group. It was expected that self-monitoring of study behaviors would result in a significant difference between the study and dating groups, however, this difference was insignificant. The authors were unable to account for this unpredicted result except in terms of some methodological problems which they encountered. They hypothesized that perhaps

...self-observation of any important life activity leads to an evaluation of how time and energy are invested in other areas, i.e., study behaviors, thus leading to the generalized effects obtained [p. 495].

They agreed, however, with their original hypothesis that self-observation procedures are not inert assessment procedures and can and should be used to affect behavior change in a therapeutic direction.

In an attempt to examine the effects of self-observation on classroom behaviors, Broden, Hall, and Mitts [1971] conducted two separate experiments with junior high school students using an N=1 experimental design. In Experiment 1, the subject was an eighth-grade
girl who had expressed a concern for her poor school work in history. The results of this experiment showed that self-recording had a rather significant impact on the amount of study time she devoted to her history class. Apparently, with this type of research, the reactive effects of self-observation and self-recording are highly desirable since they account for the appropriate change in the target behavior. In a similarly designed experiment by the same authors, self-recording was employed to decrease an "inappropriate" behavior (talking out) of an eighth-grade boy. The results of this experiment, although demonstrating the potential of self-recording for decreasing undesirable behaviors, are not as conclusive as the results of the first experiment.

In a study by Herbert and Baer [1972], two mothers were trained to affect social and task-related improvement in their children's deviant behaviors. The training required the mothers to self-observe and self-record the amount of attention they gave to appropriate behaviors by their children. The results of the study indicated that during a baseline period, 53 percent of the mother's attention followed appropriate behavior. When self-recording was instituted, the percent increased to 72 while, simultaneously, their children's appropriate behaviors increased. During the third phase of the study, when the mothers discontinued self-recording, their attention stabilized at 65 percent. A second intervention phase increased the mother's attention to 85 percent. A third baseline period revealed that the mothers' attention to appropriate behaviors had been maintained at an average of 80 percent.
In a similar experiment by Herbert and Baer [1972], a mother was instructed to count her attention given to appropriate child behavior. This instruction alone had little effect on the mother's attention or on the child's inappropriate behavior. The authors concluded that attention to appropriate behavior is likely to increase that behavior and simultaneously decrease attention to inappropriate behavior, while attention to inappropriate behavior is likely to have no effect on that behavior.

There have been numerous studies in which self-monitoring has been used in conjunction with other treatment variables. Mahoney, Moura, and Wade [1973] investigated the effects of self-reward, self-punishment and self-monitoring techniques on weight loss in a group of fifty-three adults. The results of this study demonstrate that self-reward techniques are superior to both self-monitoring and self-punishing techniques. Self-monitoring and frequent weigh-ins alone failed to produce a substantial weight loss. However, in another study, Mahoney [1974] found that the effects of self-monitoring can vary considerably in terms of reactivity in weight control programs. Apparently, differential self-monitoring effects are due to different variables of the self-monitoring technique.

McFall and Hammen [1971] investigated the effects of a stop-smoking clinic which

...offered no "treatment" but encouraged motivated volunteers to employ self-control and required them to monitor their smoking and to report their progress at regular intervals [p. 80].

All of the subjects engaged in one of the four self-monitoring conditions:
1. **Minimal self-monitoring** in which they merely kept a record of the number of cigarettes they smoked daily.

2. **Negative self-monitoring** in which they recorded every instance in which they were unable to resist smoking.

3. **Positive self-monitoring** in which they recorded every instance in which they were able to resist the temptation to smoke.

4. **Fixed-positive self-monitoring** in which they had to earn a minimum of twenty positive points each day.

In terms of success rates, there were no significant differences between the four treatment groups.

Rutner and Bugle [1969] conducted a study in which the objective was to determine if self-monitoring with and without social reinforcement could function as modifier of psychotic behavior in a 47-year-old female volunteer resident of a state mental hospital. The woman had been diagnosed as schizophrenic and had been suffering from frequent auditory hallucinations. As part of the intervention strategy, she was instructed to privately record the number of hallucinations that she had during a three-day period. Next, she was told to display in public the frequency of the hallucinatory behaviors. This public display served as a stimulus for social reinforcement from the hospital personnel contingent upon a reduction in the number of reported hallucinations. Interestingly, on the first day of private recording, the woman reported 181 hallucinations; however, by the third day she reported only eleven hallucinations. During the remainder of the experiment, when her hallucinations were made public, they decreased to an average of two per day. Apparently, the private
self-monitoring caused a substantial reduction in the number of hallucinations while the subsequent social reinforcement maintained the reduction.

In a study designed to alter the evaluative self-thoughts of two elementary school teachers, Hannum, Thoresen, and Hubbard, Jr. [1974] used an intensive clinical design in which repeated measures were obtained on each subject during each phase of the treatment. Self-recording of positive and negative self-thoughts were used to obtain a stable baseline measure of these behaviors prior to the institution of various intervention strategies. During the baseline period, one teacher's negative self-thoughts decreased immediately. The authors concluded that this may have been due to the reactive effects of observing this behavior and being "shocked" at the high initial frequency noted. The second teacher's continued increase in positive self-thoughts throughout the study, irrespective of the intervention technique employed, led the authors to conclude that this too was likely the result of reactivity associated with self-observation.

There are numerous additional studies which have investigated the effects of self-monitoring, plus other treatments, and may be of interest to readers in this area [Horan, Hoffman, and Macri, 1974; Marlatt and Kaplan, 1972; McNamara, 1972; Romanczyk, 1974]. The results of these studies, however, fail to demonstrate any clear efficacy of self-monitoring as a treatment component.
Systematic self-observation seems to be a widely used and important instrument in behavior-change programs. It is not always feasible to have an external observer present, hence, the emphasis on self-observation skills in behavioral research. Besides its use as a data-gathering device in experimental research, self-observation has been found to have effects which can be used to produce desirable behavior change. Attending to one's own behavior may serve a cueing function by reminding the subject of the behavior being observed. In addition, self-observation may provide the kind of information feedback which sets the occasion for self-initiated behavior change. Research evidence is somewhat inconsistent with regard to whether self-observation increases or decreases the rate of the observed behavior, however. Some suggest that self-observation of a value-laden behavior yields predictable behavioral self-evaluation and self-changes. Johnson and White [1971] hypothesize that self-observation results in behavior change in a "therapeutic" direction. That is, if one's reason for observing a behavior is to eventually increase that behavior, self-observation could affect an increase by itself.

While self-observation clearly violates the requirements of non-reactive measurement, its use as a behavior-change agent has more important consequences for the individual. If self-observation is used as a data gathering tool, care should be taken in choosing the appropriate experimental design. The reactive effects of self-observation should be experimentally parcelled out from the effects of the independent variable(s). The problem of reliability of self-
collected data poses additional problems. It is almost impossible to obtain independent corroborative data when the self-observed behaviors are private. These and other methodological problems will have to be resolved before the results of studies employing self-observation can be regarded as valid and reliable.

**Self-Reinforcement**

Recently, the phenomenon of self-reinforcement (SR) has been introduced as an important concept in the understanding of self-management. It has been suggested by some that SR may be the principle motivational feature in the self-regulation process. Life situations continually demand that persons evaluate their own performance and determine standards for the self-administration of praise or punishment. The study of SR has its empirical roots in the numerous observations that individuals do exercise control over their behavior by self-generated consequences.

The empirical support for the SR concept provides increasing evidence for a mechanism which has the special function of controlling a person's behavior, independent of the momentary environmental circumstances, thereby fostering the autonomy of the organism [Kanfer, 1970, p. 191].


Individuals regulate their own behavior by mechanisms of self-reinforcement, i.e., self-generated anticipatory consequences which allow future contingencies to function as current stimuli which influence present behavior. In addition, self-regulation is influenced by the fact that the individual can make self-evaluations of the consequences of his own actions as these consequences are made apparent by reinforcement contingencies [p. 15].
Skinner [1953] defines SR as the "'ad lib' administration of a reinforcing stimulus by the organism to itself, contingent upon emitting a particular response" [p. 230]. He relates SR operationally to the contingent self-evaluation the organism makes following a response and suggest that the construct operates as a regulating mechanism determining overt behavior in the absence of environmental control. He feels that SR is one of the primary ways an individual institutes or shapes self-controlling responses. An individual has available a pool of reinforcing stimuli, but he takes a reinforcer or gives himself reinforcement only when his behavior meets the criteria he set for reinforcement [Skinner, 1953].

Kanfer and Marston [1963b] note that when an individual evaluates or judges his own behavior, these self-evaluative judgments are subject to reinforcement. Thus, judgmental responses are self-reinforcing and explain, to some extent, how certain individuals bring behavior under their own control in the absence of another person who selectively reinforces certain responses. Kanfer [1970] feels that self-evaluation may be the mediating link between previously socially regulated experiences and a person's tendency to administer SR.

Bandura [1971] supports a similar relationship between SR and self-evaluation. He suggests that any SR event is characterized by several important features:

1. It involves a self-prescribed standard of behavior which serves as the criterion for evaluating the adequacy of one's performance.
2. It often entails social-comparison processes because objective feedback of adequacy is not always available to the individual. Consequently, the performances of others are used to guide meaningful self-evaluation.

3. The reinforcers are under the person's own control.

4. The individual serves as his own reinforcing agent [p. 228].

Of current research interest is the investigation of the conditions under which self-reinforcing responses are acquired and modified, and the investigation of the extent to which self-administered consequences serve a reinforcing function in controlling an individual's own behavior [Bandura, 1971]. There are basically two theoretical positions with regard to the development of self-reinforcement behavioral patterns. Kanfer and his colleagues support a direct learning paradigm, while Bandura and his co-workers stress the role of vicarious learning in the development of SR behaviors. Both groups of researchers emphasize self-observation, self-evaluation, and self-reinforcement in their conceptual analyses of self-regulation, and both groups agree that,

...the self-evaluation that occurs in the second component results from comparisons of one's self-observed performance to social or self-imposed standards [Thoresen and Mahoney, 1974, p. 66].

While their conceptual approaches to SR are similar, their laboratory research has focused on different subjects, tasks, and learning styles [Thoresen and Mahoney, 1974; Kanfer, 1970]. They differ primarily in their interpretation of the conditions under which SR responses are acquired and maintained. Since several authors have
devoted considerable attention to the distinction between these two perspectives, only a brief summary will be provided here.

It seems to be generally agreed upon that SR responses are, to some extent, directly established through selective reinforcement administered initially by socialization agents. In the directed learning paradigm, SR is conceptualized in the following manner:

An agent adopts a criterion of what constitutes a worthy performance and consistently rewards persons for matching or exceeding the adopted standards, while non-rewarding or punishing performances that fall short of it. When subsequently persons are given control over the administration of reinforcers, they are likely to reinforce themselves in a similarly selective manner [Bandura, 1971, p. 236].

There is also a substantial body of evidence which suggests that SR responses are established through modeling. In the vicarious learning paradigm, most of the studies have involved children observing models performing tasks and differentially rewarding themselves for their performances. Children are then allowed to perform the task alone and self-administer rewards contingent upon their own criteria for performance. The results of these studies suggest that children generally adopt the same standards for SR as those observed in exemplary models.

The majority of the empirical studies reviewed in this section utilize one of these two research paradigms to demonstrate the determinants of SR responses. Most of the studies involve patterns of self-reward, but few explore the behavioral effects of self-managed reinforcement or the utility of such self-management in modifying problematic behaviors. It has been suggested that self-management programs based on SR would contribute significantly to resistance to
extinction of positive target behaviors than would programs which rely heavily on externally managed behaviors [Johnson, 1971]. This hypothesis is based on the fact that self-administration of contingent reinforcement systems can function to enhance the discrimination of reinforced behavior, and to condition self-evaluative responses as secondary reinforcers [p. 147].

In one of the earliest studies undertaken to demonstrate the effects of social learning via modeling on the adoption of SR patterns in young children, Bandura and Kupers [1964] used a miniature bowling game in which adults modeled differential self-reward patterns. The children's patterns of self-reward and self-punishment closely matched those of the models to whom they had been exposed. In a similar experiment, Bandura, Grusec, and Menlov [1967] investigated the effects of nurturance of an adult model, social reinforcement for high self-imposed standards, and the presence or absence of a model on the rates of SR displayed by the subjects. The results suggest that model nurturance and exposure to lenient peer models led the subjects to adopt lenient self-reward patterns, while exposure to competent adult models who adopted a high criterion of self-reward resulted in adoption of more stringent criteria by the subjects. Mischel and Liebert [1966] found that the adoption of criteria for self-reward depends not only on the model's performance, but also on the model's imposition of his standards on the subjects.

Rosenhan, Frederick, and Burrowes [1968] examined the effects of consistencies of and discrepancies between what an adult preached and what he practiced on the acquisition and violation of norms of
self-control. The main conclusion drawn by the investigators is that the internalization of a high norm for self-reward is most likely to occur when a child is exposed to a model who is consistently stringent in the standards he imposes on himself and on others.

Many studies have shown that persons adopt a self-monitoring system which results in positive or negative self-evaluations, but few have demonstrated that self-administered consequences have reinforcing capabilities. Bandura and Perloff [1967] designed a study which involved a comparison of the efficacy of self-monitored reinforcement with that of externally imposed reinforcement with elementary school children. Their results seemed to suggest that self-monitored reinforcement and externally applied reinforcement are equally efficacious and that both experimental conditions are more successful than no incentive or non-contingent reinforcement. In addition, it was noted that the children in the self-determined performance standard group imposed exceptionally stringent self-reward standards on themselves.

Johnson [1970] investigated the relative effectiveness of self- and external reinforcement procedures in maintaining attention behavior in twenty-three first and second grade "inattentive" boys. He also examined the effects of these two reinforcement conditions on resistance to extinction and generalization of attentive behaviors to the classroom. The results of his study indicated that all subjects were performing equally well under the same reinforcement schedule; however, the differential reinforcement phase saw both the self-reinforcement and the external reinforcement groups maintain their high responses,
while the no-reinforcement group's responses gradually extinguished. During the return to baseline, the self-reinforcement group showed the greatest resistance to extinction. The disappointing result of the study, however, was a lack of generalization of attentive behaviors to the classroom by any of the groups.

In a study which contrasted the long-term effectiveness of teacher-determined reinforcement with that of self-determined reinforcement, Frederiksen and Frederiksen [1975] demonstrated ... "the extended usefulness of a self-control procedure in a 'real world' public school setting" [p. 314]. The subjects in this study were fourteen special education students. The investigators employed a multiple baseline design in which teacher-determined token reinforcement for compliance with the criteria for the target behaviors was followed by student-determined token reinforcement. The results demonstrated that, although teacher-determined reinforcement was more effective in terms of the target behaviors than self-determined reinforcement, the difference was minimal in terms of the overall effects of the token reinforcement on the target behaviors.

As early as 1962, Kanfer and his colleagues were investigating the phenomenon of SR, using a directed learning paradigm. Kanfer, Bradley, and Martson [1962] taught subjects to take over the control of the administration of a reinforcing stimulus contingent upon the criterion performance. With continued practice in SR, the investigators found that the accuracy and frequency of SR responses increased. This was the initial study of SR which attempted to determine the efficacy of teaching individuals to maintain accurate SR
behaviors in the absence of external reinforcement.

In a study designed to investigate the effects of various training variables on the acquisition of frequent and accurate SR responses, Kanfer and Marston [1963a] conducted three separate experiments. In Experiment I, the effect of the amount of previous learning in SR on the frequency and accuracy of SR responses was investigated. Experiment II investigated the effects of instructions about the stingency of the criteria for SR on the dependent measure. Experiment III examined the similarity of discriminative and reinforcing stimuli in the acquisition of self-reinforcement. The results of all three experiments suggest that the ability of the subject to assume the SR responsibilities from an experimenter is systematically affected by the following variables:

1. The subject's previous level of learning of the discriminative self-reinforcing responses.

2. The effects of differential instructions given to the subjects to encourage or caution the subject about making SR responses.

3. Changes made in the stimulus properties of the original discrimination task [p. 247].

Kanfer and Duerfeldt conducted two related studies in which the relative effects of external reinforcement on SR was examined. The results of the first study [1967b] support the authors' hypothesis that "training in self-administered reinforcement enhances performance under extinction" [p. 244]. The SR group was able to improve their accuracy when operating under their own reinforcement schedule to a greater extent than when they were in the non-contingent reinforcement phase.
In the second study [1967a], the effects of pre-training on self-evaluation and self-reinforcement were investigated. The results suggest that prior experimenter evaluations affect subsequent self-evaluations by a subject, but neither an experimenter's evaluations nor a subject's self-evaluations have any significant impact on the self-reinforcing behavior of the subjects. The authors conclude that changes in self-evaluations do not always result in changes in self-reinforcing behaviors.

The development and maintenance of socially approved behavior by self-regulation are presumed to occur as the result of positive and negative self-evaluation, originally based on positive and negative reinforcement from the social environment. Kanfer and Duerfeldt [1968] examined the relative effects of these two types of environmental reinforcement on later positive and negative self-evaluations. They looked at the combined effects of positive and negative external reinforcement during a training phase with self-reward or self-criticism during a test phase. The results indicate that differences in group treatment during training are less important as a determinant of frequency of SRs than is the mode in which SR is expressed. The approximation to externally administered reinforcement was considerably closer under conditions of self-reward than under conditions of self-criticism. The authors felt that these findings support the hypothesis that an individual's tendency to reward or punish himself is a function of prior learning and partially independent response systems. The likelihood that self-rewarding and self-critical systems may not function in perfect unison has been demonstrated in
other studies.

In several studies it has been suggested that self-reinforcement is often prepotent over some of the possible kinds of external reinforcement. Ginn [1973] conducted a study in which one of the variables which might affect the occurrence of SR was investigated. He wanted to examine the effect of establishing an expectancy for performance on SR and its relationship to external reinforcement. The results indicate that the manner in which an "expectancy set" is imposed on subjects has to be stronger in order to overcome the individual's own "reinforcement set" established by previous learning experiences and other personality variables.

Reshly and Mittman [1973] examined rates of positive SR among children varying in self-esteem status under three different experimental conditions which varied in task ambiguity. Self-esteem status was determined by using the Self-Esteem Inventory [Coopersmith, [1959]. The results revealed negligible, non-significant differences among males and females on rates of SR and on the Self-Esteem Inventory scores. However, the analysis of variance of main effects revealed that rates of SR varied among the different levels of self-esteem status. A post hoc analysis revealed a direct positive relationship between self-esteem and rates of SR.

Several clinical studies involving SR, combined with other treatments, have been conducted. Stamps' [1973] study confirmed the efficacy of both training in SR and group therapy techniques in modifying children's feelings of competency, expectancy of success, and levels of academic performance.
Very few studies have focused on self-punishment as a self-control technique. Basically, self-punishment is designed to decrease a target behavior and may take one of two forms:

1. Negative self-punishment, a condition whereby a person optionally self-administers some aversive stimulus following a target response.

2. Positive self-punishment, a condition whereby a person optionally removes a positive stimulus after a target response [Thoresen and Mahoney, 1974, p. 93].

The use of negative self-punishment or the self-administration of aversive consequences has been used primarily in therapeutic settings with a variety of unusual behavioral problems. Axelrod, Hall, Weis, and Roher [1974] successfully employed positive self-punishment in two separate case studies in which the undesirable behavior was cigarette smoking.

Because of the relatively few number of studies which have isolated self-punishment as a self-control technique, conclusions regarding its efficacy must be regarded as tentative and somewhat inconsistent at this point. Thoresen and Mahoney [1974] suggest that the most effective use of self-punishment in a self-control program will involve two variables: (1) positive rather than negative punishment, and (2) punishment combined with a systematic self-reward procedure.

**Summary**

Skinner [1953] suggests that one of the ways in which individuals control their own behavior is by the administration of rewards to themselves without environmental restrictions upon certain behaviors.
The recent interest in self-reinforcement behaviors lies in their potential role in understanding how self-regulation of complex individual behaviors occurs in the absence of continual external intervention. In general, it would appear from the studies reviewed that self-reinforcement strategies may provide an effective incentive component for the initiation and maintenance of certain behavioral responses. If this is true, an understanding of the self-controlling variables which lie in the repertoire of discriminative stimuli in the subject's public and private behaviors should strengthen a behavioristic framework for the analysis of self-management.

For the most part, empirical research on the parameters of SR has been conducted in highly controlled laboratory situations. The question of whether these generalizations will transfer to situations in the natural environment are tentative at this point. The indications are that future research in the area of SR will not be as far removed from clinical and field applications as the initial studies employing the two research paradigms which were discussed in this review. It is expected that more studies in the future will focus on those conditions in the natural environment which appear to serve a maintenance function in SR behaviors. Bandura [1971] suggests that we need not waste any time and effort explaining "why" individuals self-reward themselves; we should concentrate on the more challenging question of "why people deny themselves available rewards over which they have full control, and why they punish themselves" [p. 253].
Another important question which Bandura [1971] raises involves the reinforcing function of self-administered consequences. There is relatively little research which explicates the conditions under which self-generated consequences serve a reinforcing function in altering and/or maintaining behavior. This seems to suggest that we need to study the SR behaviors of individuals in their natural environments.

Few experimental studies have investigated the effectiveness of self-punishment as a self-management procedure. The paucity of research in this area may be due to the relative success found with self-reward conditions. Thoresen and Mahoney [1974] suggest that intervention plans which rely solely on punishment generally are not effective because many behaviors are relatively resistant to punishment. Self-administered punishment is thought to produce negative emotional reactions such as feelings of dislike, anxiety, anger, etc. in some individuals. Thus, it appears that punishment alone may not be a desirable self-control strategy.

In summary, it seems that SR may serve a reinforcing function by providing immediate support for self-controlling behaviors until the benefits that eventually accrue take over the reinforcing function. When individuals learn to make the administration of self-rewards contingent upon the performance of self-controlling behaviors, they are more likely to affect change in themselves in a variety of problematic situations. A self-managed life style may well hinge upon an effective self-reward system.
Covert Self-Control

It is particularly important that a science of behavior face the problem of privacy...An adequate science of behavior must consider events taking place within the skin of the organism...as part of behavior itself [Skinner, 1963, p. 953].

Despite the recent overwhelming interest in self-management and self-reinforcement, there has been, until very recently, a noticeable lack of research on their covert (private) components. It is not that private phenomena have been entirely ignored; there is frequent mention of covert responses in the literature, but few writers emphasize their scientific legitimacy and clinically indispensable status. In fact, most behaviorists are reluctant to incorporate cognitive events into a theoretical framework of behavior analysis. Thoresen and Mahoney [1974] feel that covert processes have not received attention from behavioral researchers for two main reasons:

1. There has been an implicit assumption that private events thoughts, feelings, etc. are somehow immune to the predictability and control that characterize overt responses, and

2. Until recently, many researchers felt that cognitive processes were somehow "soft, unscientific, and necessarily vague" [p. 109].

Bandura [1969] suggests that the relative paucity of research in this area results from the limited accessibility of covert behaviors.

Thought processes are directly observable only to the person within whom they occur and therefore their presence, absence, and exact nature cannot be independently verified [p. 38].
He feels, however, that researchers have belabored the methodological limitations of obtaining accurate assessments of covert behaviors. Mahoney [1974] concurs that "early behavior modifiers were content to restrict their analyses and operations to discrete and blatantly observable phenomena" [p. 3] in order to avoid any form of psychological inference.

Careless and wholesale reliance on unjustified inference can, of course, cripple an empirical enterprise...however, one wonders if the early behaviorists were aware that none of their respected colleagues in physics had ever actually "observed" an electron [p. 3].

Homme [1965], one of the first behaviorists to undertake a serious analysis of the control of implicit events, feels that many researchers have needlessly exaggerated the problem of covert response definition and detection. He suggests that under normal conditions,

...each subject is a highly sophisticated computer when it comes to discriminating the occurrence or nonoccurrence of behavior in himself [1965, p. 503].

If private events are regarded and treated as behaviors, or responses, Homme maintains that the problem of definition is a pseudo one. Covert events, if treated as behaviors, are subject to the same conditioning properties as operant (observable) behaviors. Thus, he refers to private events as "coverants," a contraction of "covert operant" [1965].

The underlying premise for what might be termed a "technology for modification of cognitive behaviors" [Mahoney, 1974] is that internal behaviors such as thoughts and images are similar to external behaviors and are subject to the same behavioral principles.
Apparently, private events do act as discriminative stimuli for certain overt behaviors and as such, have important consequences. Williams and Long [1975] suggest that an analysis of self-management should include an extensive examination of covert behaviors because,

...a covert reaction may be an important link in a stimulus-response chain leading to an overt behavior and because overt behaviors may be changed by visualizing specified behaviors and consequences [p. 43].

These authors maintain that covert behaviors appear to be correlated with certain overt responses and become part of well-established behavioral chains. Therefore, the maintenance of behavior will necessarily require the control of both the covert and overt components of specific behavioral chains.

Thoresen and Mahoney [1974] provide the most complete conceptualization of covert control. Their perspective includes three functions which covert events appear to serve. First, covert behaviors may serve a cueing function. That is, they may act as antecedents for other covert or overt responses. The thought of food or sex may prompt one to engage in related behaviors. Covert behaviors may also represent target behaviors, unwanted covert responses, which require modification. Inappropriate and/or unrealistic self-evaluation often lead to additional self-critical thoughts and overt behaviors; consequently, these undesirable covert behaviors become target responses to be altered. Third, covert events may serve as consequences of other behaviors. Thoresen and Mahoney [1974] suggest that much self-criticism which occurs privately is unjustified and tends to reinforce the behaviors that it follows. Positive covert
responses may also strengthen behaviors that they follow.

Although the empirical research in the area of covert self-control is relatively limited, there has been a number of fairly recent research attempts to examine private events. Most of the studies, however, involve clinical research and focus on the modification of minute covert responses. In the future, it appears that we can expect to see a more exhaustive body of research coming from those committed to cognitive behavior modification. At least, the trend seems to be toward a more comprehensive theory of behavioral self-management which includes the cognitive-symbolic processes.

Many of the studies which focus on coverants as target behaviors rely upon Homme's [1965] covert control strategy. Homme developed a self-contingency management strategy to regulate undesirable covert behaviors by applying Premack's [1965] differential probability hypothesis. Stated rather simply, Premack's principle or hypothesis is as follows: "For any pair of responses, the more probable one will reinforce the less probable one" [1965]. This means that the individual can reinforce himself with high probability events contingent upon the execution of low probability events. Homme [1965] suggests that if coffee drinking is a high probability event for an individual, it can be used to strengthen, for example, the rate of positive self-thoughts, the covert target behavior.

Johnson [1971] applied Homme's covert control strategy in two separate case studies. In both cases, the treatment procedure combined the verbalization of statements written on a 3 x 5 inch index card and behavioral rehearsals with the therapist. The cards were carried by
the subjects and contained one statement per card which the subjects were to read prior to engaging in high probability events. Behavioral rehearsal was used to enhance the clients' repertoires of appropriate responses related to the statements on the cards. In role playing episodes, the subject read a statement and reflected upon the desirable operant performances.

In the first study, the therapist strengthened appropriate coverants (thoughts and verbalizations) in order to increase the probability of desired operants in a young man who suffered from heterosexual anxiety. This procedure proved successful in reducing the subject's anxiety associated with heterosexual relationships in addition to solving other problem areas related to self-association and interpersonal communication.

In the second case, operants were used to induce desirable coverant changes. The subject was performing a variety of desired target behaviors but was retaining a repertoire of inappropriate coverants which were apparently disruptive to the new behaviors. It is not uncommon, according to Johnson [1971], to find subjects who have made significant progress in adopting new behaviors to maintain a wide variety of coverants which are associated with previous undesirable performances. After several weeks of engaging in activities which were immediately absorbing and reinforcing, the subject reported no depressive episodes and the occurrence of more positive thoughts (coverants).

In a study which demonstrated the efficacy of modifying covert responses via external contingencies, Mahoney, Thoresen, and Danaher [1972] chose imagery as the target covert response and used either
external positive reinforcement or punishment as the treatment variables. The results of the study suggest that covert behaviors are functionally related to their consequences and can be accelerated or decelerated via external control. The authors drew two major implications from their findings:

(1) some covert behaviors can be modified by their consequences; and
(2) overt behavioral indices may be very helpful in assessing the magnitude and accuracy of self-reported changes in covert responding [p. 13].

In addition, they concluded that their findings support the significance of covert responses as reinforcers, punishers, and discriminative cues for other responses (overt behaviors).

Horan and Johnson [1971] examined Homme's contention that overeating can be eliminated by using a self-management application of the Premack Principle to reinforce coverants incompatible with overeating. Although the results of this study provide support for the use of covert conditioning in a self-management weight control program, the efficacy of the Premack Principle was not established in this study. Apparently, in this particular situation, the use of coverant pairs without reinforcers (HPB) was sufficient to cause a significant weight loss.

One of the more recent research areas in covert self-management involves cognitive modeling in which the individual learns to self-verbalize instructions. Meichenbaum and Cameron [1974] provide an excellent review of a broad variety of case studies, field experiments, and laboratory investigations which highlight the significance of what a person says to himself. The beginning of research in this area
occurred in the early 1960's when Vygotsky, a Russian psychologist, discovered that internalization of verbal commands and instructions is a critical phase in a child's development of voluntary control of his behavior, particularly his motor behavior. This led Meichenbaum and his colleagues to undertake a series of experiments involving self-instruction as an aid to attending behaviors with impulsive children and later with schizophrenics. It appeared to them that impulsive and schizophrenic children do not employ "private speech" in an effective manner.

Bern's [1967] initial study in which young children were taught verbal self-control was a forerunner for the investigations with impulsive children. She examined the ability of three- and four-year-olds to generate self-instruction and to respond to it effectively. Her primary research interest was in determining whether young children could be taught to regulate their own behavior by means of behavioral rehearsal in self-instruction. A novel perceptual task was used and the dependent measure was the percent of correct responses made on the task. The results of Bern's study led her to conclude that verbal self-control can be established in children as young as three years of age.

In two related studies, Meichenbaum and Goodman [1971] trained impulsive children to talk to themselves to reduce undesirable behaviors. The experimenters were successful in employing a cognitive self-guidance training program to change the behavior of these impulsive children. The results indicate that modeling, plus training, in self-instruction is most effective in altering the attentional strategy
of impulsive children.

In another study involving self-instructional training, Meichenbaum and his colleagues [1974] found that imagery, coupled with self-instruction, is particularly effective with young children. In addition, they noted the importance of beginning with tasks with which the children are familiar and of using a series of successive approximations whereby they proceed from simple self-statements to more complex ones.

Following the self-instructional paradigm used with impulsive children, Meichenbaum and Cameron [1973] modified the behavior of hospitalized schizophrenics. Part of the treatment was directed at improving their performance on attentional and cognitive tasks. This phase of the treatment was successful. In addition, the experimenters worked individually with each patient and taught him to monitor his own behavior and to recognize non-verbal cues from others, indicating that his behavior departed from the "normal." Within a relatively short period of time, the schizophrenics were trained to use a set of self-controlling self-statements which helped them alter their own bizarre and incoherent behaviors. Two other unpublished studies by Meichenbaum [1971, 1972] demonstrated the usefulness of self-instruction in behavior modification.

In another study involving self-statements and self-evaluations, Hannun, Thoresen, and Hubbard [1974] examined the modification of self-esteem in two voluntary elementary school teachers who claimed to be excessively self-critical. In addition to altering their self-esteem, the authors were interested in determining whether changes in self-
evaluative thoughts would result in changes in related external behaviors. Although the results of this study are somewhat equivocal, the authors conclude that it seems reasonable to assume that covert events are modifiable. Both teachers increased their positive self-thoughts and decreased their negative self-thoughts during various phases of the study. It appears from the results that self-esteem may be situation-specific rather than a global measure of positive or negative self-evaluations. An additional observation was made by the authors which seem to suggest the necessity for continued research in this area. An individual may be very self-critical due to unrealistic evaluative standards, although he appears to be handling environmental stresses adequately. This is further indication of a need to modify covert behaviors in certain situations rather than assume that the modification of overt behaviors will automatically result in a change in private behaviors.

Many problematic behaviors have been successfully eliminated by altering the covert stimulus cues and responses preceding the target behaviors. Most attempts to alter antecedent covert responses are found in the clinical research focusing on maladaptive overt behaviors. The most frequent intervention strategy employed in these studies is a technique known as "systematic desensitization." This procedure is based on the principle of reciprocal inhibition [Wolpe, 1958] and typically involves the imagination in short, graded exposures of an anxiety-producing situation or object while the person is very relaxed. Training in self-administered desensitization involves learning hierarchy construction leading to a feared or previously
avoided situation, as well as training in muscle relaxation. Wolpe [1958] describes the desensitization process in the following manner:

If a response antagonistic to anxiety can be made to occur in the presence of anxiety-evoking stimuli so that it is accompanied by a complete or partial suppression of the anxiety responses, the bond between these stimuli and the anxiety responses will be weakened [p. 71].

Many phobic behaviors have been eliminated by using this technique because it is relatively easy to construct a hierarchy of graded feared situations leading to the ultimate feared situation or object. It has also been quite effective with patients reporting difficulties in interpersonal relationships in which anxiety-producing stimuli have a debilitating effect on performance.

Migler and Wolpe [1967] used systematic desensitization in a therapeutic situation to treat a young man's fear of public speaking. In this study, both the relaxation training and the imagination of scenes from the hierarchy were carried out at home, entirely by the patient, using a specially modified tape recorder. After the final session at home, the patient reported delivering a long, controversial speech at a staff meeting without experiencing any of the previous signs of anxiety. An eight-month follow-up revealed that he was still able to speak in public without anxiety or avoidance behaviors. In addition, he reported that the desensitization had generalized to other situations in which he had previously been unassertive and anxious. The results of this case study are supportive of future attempts to apply self-desensitization procedures.

In an experimental effort to determine the necessity of the therapist's presence in desensitization therapy, Kahn and Baker [1968]
treated mild phobic subjects exposed to one of two treatment conditions: (1) a "conventional desensitization group," or (2) a "do-it-yourself" group which carried out the desensitization process at home. The do-it-yourself group used a kit which consisted of a manual for self-desensitization, including Jacobsen's (1938) relaxation training, in addition to a twelve-inch long-playing record which complimented the manual. For a period of six weeks both groups underwent training in desensitization. The results indicated that both groups did equally well.

Systematic desensitization and progressive relaxation training were compared with an attention control group and a no-treatment control group by Zeisset [1968]. The target behavior in this study was "interview anxiety" and the subjects were psychiatric patients. The desensitization group received training based on Wolpe's method while the progressive relaxation training group received intensive training in various methods of relaxation and under varying conditions. The results of this study indicated no significant difference between the two treatment groups. Although systematic desensitization training proved to be equally effective, the author concludes that relaxation training may have more applicability to a variety of situations, particularly with individuals experiencing diffuse anxiety.

Summary

Although a wide range of significant private events has been empirically examined, research in the area of covert self-control is relatively new. It seems apparent that those interested in developing a more comprehensive theory of self-management will continue their
thrust in the direction of identifying significant mediating behaviors. Mahoney [1974] feels that conventional behaviorists have impeded the research in this area because of "myopic" perspectives and their preoccupation with "hard data." He and his colleagues [Bandura, Cautela, Homme, Kanfer, Staats, Thoresen] support a mediational theory of human behavior which does not rely completely upon directly observable evidence. This model allows for a more thorough examination of internal stimuli generated by individuals as self-controlling responses. Because the individual himself is the only one who has direct access to covert phenomena, indirect methods of substantiating self-reports are badly needed in order to overcome some of the methodological problems associated with covert behavioral research. It also appears that the empirical research on covert self-control has, for the most part, been conducted in controlled laboratory or therapeutic settings. Hence, the efficacy of covert self-management in "naturalistic environments" has not been firmly established [Thoresen and Mahoney, 1974].

Summary and Conclusions of Review of Literature

Man clearly controls his own behavior so as to achieve certain objectives. The source of this control is quite often ascribed to a central adaptive mechanism ranging from the ego to the conscience. "Willpower" is a hypothetical construct which was invented to explain this elaborate role of the conscience in regulating behavior. From a behavioral point of view, self-management is an inference drawn from the functional relationships among observable responses [Bijou and
Baer, 1961]. This perspective has been modified recently to include covert responses, as well as external responses [Bandura, 1969; Cautela, 1971, Homme, 1965; Mahoney, 1974]. The principle of behavior modification describes lawful relationships between behavior (internal and external) and various environmental conditions which provide a framework for understanding the process of self-management [Kazdin, 1975]. In most cases, the behavioral techniques used to control someone else can be used to regulate one's own behavior [Skinner, 1953]. In actual practice, a given self-management program involves simultaneous efforts to increase the likelihood of certain types of responses, while decreasing other types of responses.

When self-control is studied as a total self-management program in naturalistic settings, it appears to involve three major components: (1) self-observation; (2) self-evaluation; and (3) self-reinforcement. Self-modification begins when one attends to his behavior as a result of some internal or external cue or prompt. Once the individual is cued to self-monitor his behavior, a self-evaluative process is brought into action. The self-evaluation or judgment of the adequacy or appropriateness of the behavior assumes the status of a discriminative stimulus for positive or negative self-reinforcement. When the self-evaluation leads to the recognition of a problematic behavior, specific self-control techniques may be used to alter the undesirable behavior chain.

The first step employed after recognizing a problematic behavior is a precise analysis of the response to be controlled and its antecedent and consequent conditions. An analysis of the behavior
would require a precise description of the response, the conditions under which it occurs, and its consequences. This usually requires counting and/or charting the frequency and duration of the behavior. This provides the individual with objective data pertaining to the occurrence of the problem behavior. In addition, counting and charting often increase or decrease the observed behavior by providing the individual with progress which becomes self-reinforcing and provides impetus for subsequent behavioral change.

The second step in self-modification efforts requires the identification of behaviors which facilitate the desirable response. The third step is the identification of positive and/or negative reinforcers which control these behavior patterns. According to an interpretation of Premack's Principle [Premack, 1965], a reinforcer can be identified for every response. The fourth step requires the application of several self-control techniques to produce the desired response. Some of these procedures include the following: (1) modifying consummatory behavior; (2) stimulus narrowing; (3) changing the stimulus environment; (4) establishing competing responses; (5) incorporating shaping procedures; (6) cue strengthening; (7) using response-cost techniques; and (8) modifying cognitive-symbolic events.

The fifth step requires the application of the reinforcement or punishment to alter the probability of the preselected response [Homme, 1965]. The outcome of self-control can be termed "personal contingency management" and is designed to increase the frequency of desired overt and covert responses while decreasing the frequency of undesired responses.
Rarely do self-modification efforts utilize a single self-control procedure. Most self-control programs involve a number of techniques used in conjunction with each other. Several studies have involved the design of comprehensive self-management programs, utilizing several self-control techniques. Glynn, Thomas, and Shee [1973] established behavioral self-control with young children in a classroom setting. They based their conceptualization of self-control on four components:

1. Self-assessment in which the individual determined whether or not he had performed a certain behavior.

2. Self-recording in which the individual recorded the frequency of his behaviors.

3. Self-determination of reinforcement in which the individual chose from available reinforcers the kind and amount he should receive, contingent upon the performance of a behavior.

4. Self-administration of reinforcement in which the individual dispensed his own reinforcement.

The dependent variable in this study was "on-task" behavior which the teacher carefully defined for the children for each phase of the study. Following an externally administered token reinforcement treatment, the self-control procedures were introduced into the study. The results indicated that children can use behavioral self-control procedures successfully in order to maintain high rates of "on-task" behavior in the classroom. In a follow-up investigation, Glynn and Thomas [1974] instituted the same self-control techniques following a baseline condition. In addition, they also examined the effects of a behavior cueing procedure on self-control in the classroom. Their results supported the hypothesis that behavioral self-control
procedures can be employed successfully by children without previous external reinforcement, provided they are carefully cued to "on-task" behavior. Increases in "on-task" behavior were noted only when self-control procedures were combined with continuous cueing.

Ferster, Nurnberger and Levitt [1962] developed a comprehensive self-control for obese individuals. Their program was one of the first in the area of behavioral self-control and employed the following steps: (1) determining the variables influencing the eating; (2) determining how to manipulate these variables; (3) identifying the unwanted effects (ultimate aversive consequences) of over-eating; and (4) arranging a method of developing required self-control [p. 196]. The subjects in this program were taught to modify their eating behaviors via stimulus control, temporal control of eating, extensive chaining, establishing prepotent repertoires, and bringing the ultimate aversive consequences closer to the act of eating.

In a similar self-control program for the treatment of obesity, Polly, Turner, and Sherman [1974] employed a variety of self-control techniques. Among those used were: (1) training in elementary behavior analysis; (2) self-recording; (3) goal-setting; (4) public self-recording; (5) changing the cues for eating; (6) changing eating actions; (7) breaking eating chains; (8) altering social cues; and (9) using a self-reward system. Their program is one of the most comprehensive self-control programs developed to date.

Brown [1975] developed a ten-week, thirty-hour training course to provide students with skills to control anxiety and increase self-confidence, assertiveness, and control over the actions of others in
their environment. This program was based on operant reinforcement principles and utilized a behavioral framework.

Goshko [1973] conducted a project in which children were taught skills of self-observation and then allowed to select and modify behavior of their own choice. Following participation in four instructional modules in observation and identification of behavior, children viewed a thirty-minute video-tape of themselves in a normal classroom situation. They were then allowed to select a behavior they wanted to modify. They met with the counselor who helped them develop a change which they put into action for one week. Following their self-modification efforts, they were video-taped again so that they could determine if the behavior had changed.

The preceding review of studies is representative of the kind of research being undertaken in the area of behavioral self-management. More and more researchers, clinicians, teachers, counselors, etc. are developing comprehensive self-change programs for their clientele. These programs employ principles of behavior modification and attend to a wide variety of behaviors. In an ever-changing society in which man is confronted daily by situational problems, self-management programs seem to have relevance for problem solving in "real-life" situations.

That self-management is now viewed as a legitimate area of investigation is certainly due, in part, to the fact that it has been explored in terms of systematic manipulation of antecedent stimulus events and response consequences.
THE PURPOSE OF THIS STUDY WAS TO TEACH UNDERGRADUATE PHYSICAL
EDUCATION MAJORS HOW TO APPLY BASIC PRINCIPLES OF APPLIED BEHAVIOR
ANALYSIS TO THE MODIFICATION OF THEIR OWN BEHAVIOR. SELF-MANAGEMENT
SKILLS BASED UPON A FUNCTIONAL RELATIONSHIP BETWEEN BEHAVIOR AND
ENVIRONMENTS (INTERNAL AND EXTERNAL) WERE ACQUIRED VIA A MODULARIZED
COURSE IN BEHAVIORAL SELF-MANAGEMENT. AS PART OF THE REQUIREMENTS OF
THE SELF-MANAGEMENT COURSE, EACH SUBJECT IN THE STUDY DELINEATED A
PERSONAL PROJECT WHICH REQUIRED HIM TO COLLECT, RECORD, AND GRAPH PER­
SONAL DATA AND TO APPLY SELF-MANAGEMENT TECHNIQUES TO ALTER SPECIFIC
FACETS OF HIS OWN BEHAVIOR. BECAUSE THE FOCUS OF THIS STUDY WAS THE
INDIVIDUAL AND HIS IDIOSYNCRATIC BEHAVIOR, CONVENTIONAL STATISTICAL
RESEARCH DESIGNS WHICH RELY UPON GROUP DATA WERE NOT APPLICABLE. IN
IDIOPHAGE RESEARCH OF THIS NATURE, THE EMPHASIS IS THE STUDY OF
INDIVIDUAL SUBJECTS IN DETAIL VIA WITHIN-SUBJECT RESEARCH DESIGNS
BASED UPON THE PRINCIPLES OF OPERANT PSYCHOLOGY. THUS, NO STATISTICAL
HYPOTHESES WERE GENERATED. INSTEAD, RESEARCH HYPOTHESES WHICH HAVE
RELEVANCE TO THE PURPOSE OF THIS STUDY WERE FORMULATED. THESE HYPOTHESES WERE BASED ON THE ASSUMPTION THAT THE PROBLEM BEHAVIORS OF THE
SUBJECTS IN THIS STUDY WOULD CHANGE IN A THERAPEUTIC DIRECTION AND THAT
THES CHANGES WOULD BE ANALYZED AND EVALUATED IN TERMS OF THEIR UTILITY
and clinical value to the individuals themselves.

**Self-Management Research Strategies**

**and Experimental Designs**

Various research strategies and experimental designs are found in the self-management literature. Regardless of the perspective taken by self-management researchers—pure or applied, laboratory or field, nomothetic or idiographic—Jeffrey [1974] argues that the same basic principles of experimental design are employed to establish/demonstrate cause-effect relationships. In all experimental research, concern for the collection of reliable and valid data must be demonstrated.

Because all self-management research is eventually directed toward application, investigators should consider the fundamental questions being asked in the study and carefully select a design that answers these questions. The purpose of the present investigation was to train a group of individuals in empirically-based procedures for managing their own behavior. This involved experimental field studies of an idiographic nature (intensive study of a few individuals in a controlled field setting). Because the primary emphasis was the individual and changes observed in his behavior, within-subject or single organism designs were employed in cases where it was possible to demonstrate causality. Self-management research is in its infant stage, and instances of tightly controlled experimental studies in this area are rare. Lykhen [1968] argues that methodological rigor and statistical significance are important for empirical and theoretical advances, but by themselves are insignificant criteria to evaluate the total effectiveness of a study.
He feels that many intensive case studies generate invaluable hypotheses which can be substantiated in more rigorous experimental research. The important criterion is the contribution of the study to the total self-management field. Because significance in applied behavioral research is not based on an alpha level of probability, both internal and external validity can be demonstrated through analogue research which replicates the findings of previous self-management studies. A more important concept of significance in intensive studies involving self-management is the degree of success and subsequent satisfaction experienced by the individual himself since the ultimate goal in this case is self-managed behavior across many situations. One of the fundamental assumptions of self-management research is that once changes are observed by the individual, naturally occurring contingencies will maintain those behavior changes. Although there is a paucity of research to support this hypothesis, many believe that the probability of generalization and maintenance of behavior change is increased dramatically when the individual acts as his own change agent [Bandura, 1969; Cautela, 1969; Thoresen and Mahoney, 1974].

Although in most self-management studies it is desirable and necessary to show which controlling (independent) variables produce change, the determination of causality is usually a low priority in applied self-management research. The present study attempted to isolate the causes of behavior change via appropriate experimental designs; however, the primary purpose of the study was to obtain change. In most cases, it was possible to demonstrate the relative contribution of a particular self-management intervention program or package to
behavior change with the use of an applied behavioral design. In other cases, it was only possible to demonstrate "trends" in behavior change as a result of various interventions. Significance was determined by comparing the self-collected data which was graphed with the terminal behavioral goals established by each subject.

Subjects

Fifteen undergraduate students from The Ohio State University served as subjects for this study which was conducted during the Spring quarter, 1976. The thirteen females and two males ranged from nineteen to twenty-three years of age. The subjects were volunteer physical education majors enrolled in their first of a sequence of professional courses dealing with teacher behavior and teaching strategies. All of the subjects had taken a freshman level psychology course which introduced them to the basic principles of behavior modification, but none reported that they had ever systematically applied these principles to their own behavior.

Setting

The setting for this nine-week study in self-management was The Ohio State University. Students volunteered to participate in the study as part of an elective requirement for an introductory course in analysis of teacher behavior. The first three weeks of the course were devoted to a study of behavior analysis and self-modification techniques. During this time, students met on campus in small groups each week with the instructor for the purpose of discussing materials provided them
and for learning self-management skills. The remainder of the course involved a personal self-modification research project which required each subject to collect data on himself at various times and under various conditions. Weekly individual meetings on campus with the instructor were held in order to discuss their data and to provide a support base for their initial efforts to guide their own behavior change in a systematic fashion. Subjects continued to collect data, to apply self-management skills to their own behavior, and to meet with the instructor regularly for the remainder of the nine-week study.

**Procedures**

At the second class meeting of a course in analysis of teaching behavior, the students enrolled were asked to select one of three elective mini-courses focusing on specific aspects of the teaching role. One of these mini-courses became the basis for the present study. Fifteen students elected to participate in a behavioral self-management course which required them to study behavior principles and to apply these to their own behavior via a personal research project. During the second week of the quarter, the investigator initiated the study and met with the fifteen subjects to explain the course and to give each one a copy of the modularized course manual which contained all of the materials necessary to complete the course (See Appendix B).

**Course Manual**

The investigator developed a series of five modules (See Appendix B) which constituted the self-management course and provided the subjects with the skills and knowledges necessary to carry out their self-
modification projects. Each module contained the following components: (1) Title; (2) Goals; (3) Enabling Activities; and (4) Assessment. The following modules were completed by the subjects in the order of presentation and according to a time-schedule given to them by the investigator.

(1) Introduction to the Course. The goal of this module was to explain to the subjects the purpose of the course, the general format of the course, and the objectives of the course. It was designed to capture the interest of the subjects and to impress upon them the importance of and value in becoming the agent of their own behavior change.

(2) Behavioral Self-Management. This module contained three short articles which were intended to introduce the subjects to the basic ideas and concepts of the behavioral approach to self-management. At the end of each article, there were questions to be answered by the subjects as a self-assessment of their comprehension of the ideas presented. In addition, the subjects were asked to describe five problem behaviors they were interested in modifying. For each behavior they described, they were to also describe a behavior incompatible with that behavior. From their lists of problem behaviors and incompatible behaviors, they had to select one and write a one-paragraph analysis in which the behavior was linked to the situation(s) in which it occurred (or did not occur). The purpose of this task was to help them see that behavior is situation-specific and tied to the environment in predictable fashion. The problem selected in this module became the focus of their self-modification research.
(3) Elementary Principles of Behavior Analysis. Module III was planned to acquaint the subjects with the basic principles of behavior analysis and terminology which would facilitate their self-modification efforts. In addition to answering questions related to their reading, they had to write an analysis of their problem using as many principles of behavior analysis as they could. This task was designed to develop their facility in handling the pertinent behavior concepts. Following the analysis of their problem behavior, they had to observe systematically the behavior for a period of one week. This allowed them to obtain objective data pertaining to the relevant antecedents and consequences surrounding their behavior. The final enabling task of this module required the subjects to analyze available reinforcers and to compile a pool of possible reinforcers from which they could select appropriate ones.

(4) A Personal Research Project in Self-Management. The purpose of this module was to provide the subjects with specific self-management skills which they could use to modify their problem behaviors. With the assistance of the instructor, they designed their research projects in terms of the following steps:

a. Statement of the behavioral goal(s) in precise behavioral language.

b. Definition of the behavior(s) they were going to observe and record.

c. Collection, recording, and analysis of baseline rates of their behavior(s) for a period of seven to fourteen days (depending upon the nature of their problem).

d. Decision relative to implementation of the intervention procedures which involved altering appropriate setting events, establishing effective
consequences, focusing on contingencies, and applying covert self-control to their behaviors.

e. Implementation of the intervention while collecting personal data for a period of four to six weeks (depending upon the kind of research design used).

f. Analysis of their data in terms of the amount and significance of change realized in their behavior.

g. Evaluation of the relative success of their self-modification efforts.

(5) Applying Principles of Self-Management to Other Problem Behaviors. This module was designed to ascertain the degree to which the subjects could generalize and transfer their self-management skills to other problem behaviors. Specifically, they were required to design another personal research project which they could implement at a later time. This task required them to follow the steps in planning a self-management program which were outlined in the preceding modules.

Each subject moved through the modules at his own pace, but he kept within the projected times of completion set as guidelines by the instructor. As a result, a staggered time schedule was established which allowed analysis of the data via a multiple baseline design for subjects engaging in the same type of behavior modification program. Other research designs were used for subjects whose behaviors differed from all others.

During the second week of the nine-week study, the subjects completed Modules I and II in the self-instructional course manual and met with the instructor in groups of two for one hour to discuss the materials in these modules. They completed Module III during the third week and again met in small groups for one hour to discuss their
readings and the enabling activities they were asked to complete. The fourth week of the study they began Module IV, which continued throughout the remainder of the course. Beginning with the fourth week of the study and with Module IV, each subject met with the instructor individually for fifteen to thirty minutes per week to discuss his/her personal data. At the conclusion of the study, Module V was completed by each subject in addition to a twelve-item evaluative questionnaire (See Appendix C). This questionnaire was prepared and administered by the investigator and was designed for the purpose of determining the usefulness of various aspects of the course, as well as the amount of personal satisfaction experienced by the subjects themselves. It was open-ended and allowed for divergent responding.

Observation Techniques

During Module III, when the subjects began to collect personal data, two behavioral observation techniques [Cooper, 1974] were employed by the subjects in this study as they collected daily data on specific aspects of their own behavior. Event recording was used in situations which required a knowledge of the rate at which specific, previously defined behaviors were occurring. This observation technique required the subjects to record, via a wrist counter or with paper and pencil, every occasion of the target behavior during specified periods of time. Duration recording was the second type of observation technique and was used by those subjects who wanted to know the total cumulative time spent engaging in a particular behavior. Stop watches are commonly used for this method of data collection. The results of both types of data collection were transferred to graphs daily by the
subjects in order to provide them with a cumulative, pictorial representation of their behavior.

Each subject's research study required slightly different methods of collecting data on one discrete behavior while others were interested in the occurrence of several related behaviors. With the assistance of the instructor, the subject selected the most feasible method of collecting and recording personal data and carefully defined the behaviors in question. Appropriate graphs were provided for all subjects in order to facilitate the accurate transfer of daily data to a more permanent system of data storage. These graphs became the primary source of data analysis throughout the study. Methods of data collection and recording were carefully planned in order to set the occasion for reliable data gathering. The instructor made weekly checks of the data collected and graphed by the subjects. For those behaviors which produced a permanent product (e.g., altering caloric intake to produce weight loss), it was possible to assess the reliability of the data collected on the process-behavior counterpart.

**Analysis and Research Design**

Prior to the initiation of the self-management projects, it was decided that three experimental designs would be used because they are particularly appropriate for the kind of intimate research being conducted in this study. After the subjects had delineated and defined their problem behaviors, the investigator selected the most appropriate of the three designs for each subject. The choice of design was based upon the nature of the problem behavior, the terminal behavioral goal, and the number of subjects modifying the same behavior.
When two or more subjects chose to modify the same behavior in themselves, a multiple baseline design was employed. With this experimental design, causality is demonstrated when behavioral changes (dependent measures) occur as a result of the subjects experiencing the same intervention package (independent) at different points in time. When these changes occur only after the institution of the intervention package, while all other subjects' behaviors remain relatively stable, it is assumed that the intervention, rather than extraneous variables, is responsible for the changes observed [Cooper, 1974; Kazdin, 1975].

When behavioral changes need to be shaped gradually over a period of time, changing criterion designs are most appropriate. Thus, with subjects who chose behaviors which require gradual changes, this design was implemented. With a changing criterion design, the effect of a contingency is demonstrated when the dependent variable is controlled by changing the criterion for reinforcement or punishment. As the study progresses, the criterion is made more stringent until the terminal behavioral goal is achieved. Causality is demonstrated when the behavior consistently matches the criterion as that criterion is altered [Kazdin, 1975].

The third design which was used is a quasi-experimental design. It is an AB design followed by a maintenance period. During A, baseline data are collected and recorded, followed by B, the intervention. Following the intervention phase, a maintenance period is instituted in order to determine the rate at which behavioral changes are maintained following removal of the intervention. In self-management
research, true reversal designs are rare because they are regarded as inappropriate when the objective is to produce significant behavioral changes which should be maintained following intervention. In terms of gains made, reverting back to baseline rates may be a costly method of demonstrating causality—especially when significant changes have been realized by the individual. Instead, it is expected that the maintenance phase of the design will illustrate the significance of the changes made and not show evidence of causality.

**Intervention Package**

The subjects in this study employed an "intervention package" for changing selected behaviors in appropriate directions. The package, while slightly different for each subject, nonetheless consisted of four basic self-management techniques: (1) altering setting events; (2) establishing effective consequences; (3) focusing on relevant contingencies; and (4) applying covert self-control [Williams and Long, 1975]. Most problem behaviors are prompted or triggered by specific behavioral cues which are referred to as setting events. The altering of setting events required the subjects to utilize stimulus control, which is regulation of relevant antecedents thought to be contributing to the maintenance of the problem behavior. Behaviors are influenced by their consequences as well as by antecedent cues. Thus, the second intervention technique used by the subjects was the establishment of effective consequences which increased the likelihood that the appropriate behaviors would be performed and maintained. Effective consequences involved the identification and use of reinforcers and punishers to regulate behavior.
Because of the personal nature of self-management, self-reinforcement and self-punishment in various forms were utilized widely by the subjects in this study. Many self-management programs break down because reinforcement is not made contingent upon performing the desired behavior or because the reinforcement is too far removed from the desired behavior. The third intervention strategy involved the use of various techniques to heighten the subject's awareness of the environmental contingencies affecting his behavior. This required him to identify specific procedures which would cause him to "think about" or focus on his behavior and its consequences before he responded. One of the most common methods of focusing on contingencies utilized by the subjects in this study was self-verbalizations pertaining to their behavior and its consequences. They also used pictorial cues to prompt them to think before acting.

The fourth self-management technique used by the subjects involved covert self-control. This technique is somewhat more complex than the overt procedures described previously. The introduction of thoughts and symbolization into a behavioral chain is considerably more difficult to accomplish by yourself than are overt techniques. However, covert responses are thought to be important links in stimulus-response chains resulting in overt behaviors [Williams and Long, 1975]. Several of the more common covert strategies used in this study were thought-stopping, coverant pairs, and covert reinforcement. Thought-stopping was used when the unwanted behavior was about to occur. The subject subvocalized the word "stop" to himself in an attempt to prevent the occurrence of the behavior.
Coverant pairs emphasizing both negative and positive consequences of the behavior in question were used when the subject was under the pressure of immediate temptation to engage in the unwanted behavior. Covert reinforcement involved the use of reinforcing imagery as well as self-verbalizations following the target behavior.

The use of the "package" intervention technique has been questioned by some researchers because it is difficult to parcel or "tease" out the effects of each aspect of the treatment package on the behavior unless they are implemented at different points in time. Once again, the argument which counters this accusation is that applied self-management research is primarily concerned with effects (changes). Thus, when a treatment package produces the desired behavior changes, its significance is established. Additional investigations which separate the effects of the various components of the treatment package may be of interest to specific self-management researchers. Once the importance of a treatment package has been established, the next logical step would involve determining the relative effects of each aspect of the package.

For the purposes of this study, the graphing of behaviors was used to determine whether there were differences between baseline rates of behaviors and rates occurring during implementation of the treatment package. Differences were judged to be significant if they satisfied a criterion or goal set by the subject and the experimenter prior to the initiation of the study.
Self-Management Projects

Each of the fifteen individual research projects is briefly described in the following section. Table 1 provides a summary of the behavior profiles of the subjects in this study.

Subject 1 was a highly motivated individual who employed a number of self-control techniques to modify her problem behavior. An analysis of her problem revealed that she bit her nails when she was bored or anxious. She also discovered, with the assistance of several friends who monitored her nail biting in their presence, that much of her problem behavior was unconsciously performed. Following a nine-day baseline period in which she observed and recorded instances of the problem behavior, she implemented the intervention package. In order to alter the setting events surrounding her problem behavior, she employed several stimulus control techniques:

1. Sat on her hands or held them together to prevent unconscious biting.
2. Enlisted the aid of at least one individual in her classes and at home to "remind" her when she started to bite them.
3. Chewed gum constantly.
4. Carried an emery board to file broken nails.
5. Engaged in a different behavior requiring the use of her hands when she became bored or anxious.

Because this subject was highly motivated and reinforced by the continual daily success she experienced, she did not find it necessary to establish elaborate consequences to maintain her target behavior. Instead, she established two long-term consequences for successfully
<table>
<thead>
<tr>
<th>Subject</th>
<th>Age</th>
<th>Sex</th>
<th>Problem Behavior</th>
<th>Behaviors Monitored</th>
<th>Observation Technique</th>
<th>Experimental Design</th>
<th>Length Of Baseline (Days)</th>
<th>Length Of Intervention (Days)</th>
<th>Length Of Follow-Up (Days)</th>
<th>Total Days In Study</th>
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<td>Nail Biting, Picking at Nails</td>
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<td>ABA Reversal</td>
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<td>Event Recording</td>
<td>Changing Criterion</td>
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<td>Poor Study Behaviors</td>
<td>Tasks Completed Daily, Hours Studied Daily</td>
<td>Event Recording</td>
<td>Multiple Baseline</td>
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<td>Multiple Baseline</td>
<td>10</td>
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<td>45</td>
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achieving her terminal goal. She decided to buy herself a nice ring and to have a professional manicure if her nails were of an appropriate length at the end of the project. In order to focus on the contingencies of her project, she chose to self-verbalize the consequences of her actions (nail biting) before she acted. That is, when she noticed the urge to bite or pick at her nails or when an observer called an attempt to her attention, she immediately verbalized the positive consequences of not biting and of growing pretty, long nails. Whenever she successfully resisted the urge to bite her nails, she used a covert type of self-praise. Following intervention, a thirteen-day maintenance period in which the intervention contingencies were removed was instituted.

Subject 2 wanted to eliminate smoking on a gradual basis. Thus, a changing criterion design was employed in order to gradually change his target behavior. A seven-day baseline period was conducted in order to determine the average daily frequency of cigarette smoking, as well as the circumstances under which he smoked. Beginning with Day 8, a response-cost technique was instituted. The subject contracted with the instructor to reduce the number of cigarettes he smoked daily. The contingency was such that he gave the instructor thirty-seven dollars (one for each day of the intervention plan) which he would get back for not exceeding the criterion ceiling set for each day of the study. For each day he met his criterion, one dollar was returned to him. Whenever he exceeded the criterion for a day, the one dollar was donated to the American Cancer Society. The subject began the intervention with a criterion ceiling
which matched the average number of cigarettes he smoked daily during the baseline phase. This criterion was in effect for four days and then was lowered by one cigarette for the next four days. This procedure was repeated throughout intervention with the number of days that a ceiling was in effect being gradually reduced. Following intervention, a seven-day follow-up phase was instituted to determine the rate of smoking when no contingencies were in effect.

In order to facilitate the gradual shaping of his target behavior, he utilized the intervention package consisting of the four self-management techniques discussed earlier. As a result of noting the circumstances under which he smoked during baseline, he determined the salient stimuli which appeared to be setting the occasion for his smoking behavior. He discovered that a great deal of his smoking was spontaneous. Thus, he decided to reduce reflexive lighting up by changing the place where he normally carried his cigarettes. This caused him to "think" about smoking before he actually engaged in this behavior. In addition, he carried with him only the number of cigarettes he was allowed for that day. This prevented him from exceeding his criterion unless he " bummed" a cigarette from a friend. As a result of his analysis of controlling stimuli, he also discovered that he smoked most frequently under three circumstances: (1) driving to and from school and work; (2) following a meal; and (3) when he was drinking alcoholic beverages. He felt that the last two situations would be the easiest to modify with the use of stimulus control. Following meals, he began chewing gum, and in order to break the tie between drinking and smoking, he reduced the
amount of drinking in which he engaged. Because he decided that drinking was contributing to a gradual weight gain, he found it relatively easy to reduce his drinking behavior. He felt that his biggest problem would involve modifying the number of cigarettes he smoked while driving to and from school and work. In order to regulate his smoking while driving, he focused on the contingencies of his behavior by writing notes to himself and placing them in conspicuous places throughout the car. The notes were both positive and negative and focused on the consequences of smoking and not smoking. In addition, he carried small pieces of hard candy with him to suck whenever he had the urge to smoke. Like Subject 1, he used covert self-praise whenever he resisted the urge to smoke.

Subject 3 was a female who complained of being excessively critical of herself in a variety of situations. She felt that these persistent negative behaviors contributed to an almost perpetual "bad mood." In order to facilitate the observation of self-esteem behavior, an initial interview with the subject was conducted for the purpose of generating a list of common positive and negative thoughts and behaviors in which the subject engaged. This provided her with an objective means of self-evaluating her own behavior. An example of a positive self-thought was "I'm considerate of the feelings of those around me." A negative self-thought might have been "no one cares about me." An example of a positive behavior was taking care of a sick friend. An example of a negative behavior was refraining from initiating social contacts with people. For a period of eight days, Subject 3 collected and recorded positive and negative covert and overt
behavior. This indicated to her the extent to which her problem was "real" or imagined. She was surprised at the actual count of negative and positive behaviors during baseline. She had expected the rates to be considerably higher for negatives and lower for positives.

During the thought-stopping phase of the intervention period, she subvocalized the word "stop" whenever she felt the urge to engage in a self-effacing behavior. The purpose of this intervention was to decrease negative behavior. During this phase, she continued to self-observe actual instances of positive and negative behaviors. The positive intervention phase was instituted to increase positive behaviors. It was decided that she would use a high probability behavior to cue her to engage in a positive behavior or thought. Upon examination, she discovered that she looked at her wrist watch frequently. So, at a conspicuous place on her watch band, she attached a small "smile" sign which reminded her to engage in a positive behavior. During this phase she continued to observe and record both positive and negative behavior. During the follow-up phase of the study, the subject withdrew all intervention and continued to self-observe for a period of fourteen days.

Subject 4 was similar to Subject 3 in that she felt she was excessively self-critical. However, she discovered after observing her behavior for a week that her negative thoughts and behaviors occurred primarily in the context of class situations and school-related activities. Before beginning the formal baseline phase of her study, she too compiled a list of common positive and negative thoughts and behaviors which enabled her to be more objective in her
self-observation. Some examples of positive thoughts and behaviors that she generated included, "I'm capable of doing well in my academic subjects" and "people enjoy being with me." Negative thoughts included "I'm the worst student in my tennis class" and "I don't know if I possess enough skill to be a good teacher."

During her ten-day baseline period, she recorded every instance of positive and negative thoughts and behaviors as she had defined them prior to beginning her study. Following the collection of baseline data, she instituted a ten-day thought-stopping procedure followed by a ten-day positive intervention phase. For this subject it was difficult to determine a high-probability behavior which occurred in class situations and school-related activities. It was decided that in all of her classes and extra-curricular activities, she would identify one individual who was particularly close to her who smiled frequently. This person's smile became the cue for the subject to emit a positive self-verbalization. Following the positive interventions phase, a fifteen-day follow-up phase was instituted in which the subject continued to self-observe her positive and negative thoughts and behaviors.

The next four subjects were involved in a self-managed weight control program in which they employed the four-technique treatment package described earlier. Because each subject's weight problem involved different variables, the implementation of the four techniques mentioned above was different for each subject. Upon examination of their eating behaviors, they discovered the stimuli which were setting the occasion for their inappropriate eating and modified these in a
desired manner. Because marked changes in weight do not occur imme-
diately, the subjects decided that in order to sustain their weight
loss efforts, some immediate consequences had to be established.
Thus, they all implemented a self-administered token economy system
in which they earned or lost points for specified behaviors (See
Table 2). Each subject recorded daily points earned and attempted
to accumulate 100 points weekly, which entitled her to a reinforcer
of her choice (See Record of Points Earned, Appendix D). In addi-
tion to these immediate consequences, each established long-term
reinforcement for achieving her terminal goal. In addition to altering
setting events and establishing effective consequences, they focused
on the contingencies of their eating behaviors and used covert self-
control in specified ways.

It was decided that four kinds of records would be helpful for
the subjects in this study: (1) a record of everything they ate
daily; (2) a record of their daily caloric intake; (3) a record of the
conditions of their eating; and (4) a record of their weight. Because
weight loss generally occurs slowly, the subjects felt that the other
records would be more beneficial in maintaining their self-control
efforts. Prior to beginning collection of baseline data, the investi-
gator weighed each subject in order to get an accurate measure of her
initial weight. They were also weighed the last day of their inter-
vention period in order to determine the amount of weight loss.

They transferred their caloric intake and weight loss to
graphs and tables which illustrated the relationship between how much
they were eating and their weight. They were encouraged to take with
# TABLE 2

**TOKEN ECONOMY FOR WEIGHT CONTROL**

<table>
<thead>
<tr>
<th>Behaviors</th>
<th>Number Of Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Each time you resist the urge to snack on &quot;inappropriate&quot; foods</td>
<td>+2</td>
</tr>
<tr>
<td>2. Each time you lost one pound</td>
<td>+4</td>
</tr>
<tr>
<td>3. Each day you engage in your specified physical activity program</td>
<td>+2</td>
</tr>
<tr>
<td>4. Each time you refuse &quot;seconds&quot; at meals</td>
<td>+2</td>
</tr>
<tr>
<td>5. Each day you keep your caloric intake to the specified amount</td>
<td>+4</td>
</tr>
<tr>
<td>6. Each day you keep accurate records of your eating behaviors</td>
<td>+2</td>
</tr>
<tr>
<td>7. Each time you engage in &quot;inappropriate&quot; snacking</td>
<td>-2</td>
</tr>
</tbody>
</table>
them a notebook whereby they could record everything they ate at the time of consumption. This enabled them to be more accurate in determining the number of calories they consumed in a day. The record of the conditions under which they ate was kept during the baseline in order to facilitate their attempts to alter setting variables.

Below is a description of the specific self-management projects of each of the four subjects in the weight loss study.

Subject 5 complained of rapid and excessive weight gain during the preceding five months. She had gained approximately thirty pounds since Fall quarter, 1975. She also noted a change in her "moods" during the preceding five months. She felt more irritable and anxious. Although she worked out regularly as a runner on the Women's Track Team, this did not seem to affect her weight gain. An analysis of her baseline behaviors revealed an average daily caloric intake of 2,388 calories. She discovered that she ate more when she was angry or upset and that she ate whenever she was in a place where food was prepared or easily accessible. This included places she encountered while biking to and from school each day. She found herself snacking frequently from vending machines located throughout campus. In order to alter these controlling variables, she decided to carry a minimum amount of money (no change) with her to curb easy access to food. To prevent eating from vending machines or while on-the-go, she decided that she would not eat while standing up. She also had to eliminate studying in the Ohio Union because she snacked continuously while there. Whenever she was angry or upset, she immediately engaged in a rewarding behavior to prevent eating or
snacking at this time.

Like the other subjects in the weight control group, she established effective weekly consequences via the token economy system for weight control. In conspicuous places, she put notes emphasizing the importance of keeping accurate records and of eating appropriately. This subject used covert punishment whenever she failed to resist a temptation regarding her diet. She felt that this was a more effective means of control for her than covert reinforcement.

Subject 6 was an attractive female who complained of being overweight and of being a "junk food junkie." Although she was not excessively overweight, she did have a weight problem. Her main problem, however, was her daily diet which consisted primarily of "junk food" as she defined it. Her baseline data revealed an average daily caloric intake of 1,605 calories, but the amount of junk food that she consumed was nearly five times greater than the amount of nutritious food that she ate. When she discovered the extent of her problem, she became frightened of the long range effects such a diet might have on her health and that of any children she bore. Thus, she was highly motivated to not only lose weight, but to also improve the quality of her daily diet. Following the baseline phase of her study, Subject 6 established a criterion ceiling of 1,000 calories per day.

This subject lived alone in her own apartment and rarely prepared anything to eat. Instead, she snacked, ate on the run or frequented short order restaurants and delis. In her apartment she
kept an abundance of candy, cookies, chips, pop, etc. She claimed to have an overwhelming urge for sweets which, when indulged, completely satisfied her need for food. Thus, she ate things which were handy and required little or no preparation. Her diet resembled a series of perpetual snacks. In order to alter her eating habits and to avoid temptation, she decided to purchase and eat only nutritious snacks (raw fruit and vegetables, diet snacks). In addition, she decided to prepare at least one meal per day. She used Weight Watcher's diet and prepared her food as it suggested. In order to eliminate continuous eating throughout the day, she ate breakfast, a mid-day snack and dinner.

She, too, used the token economy system for weight control and established immediate consequences for meeting a criterion number of weekly points. To emphasize the negative effects of inappropriate eating and snacking, she placed signs throughout her apartment to remind her of these consequences. She employed the "thought-stopping" technique described earlier when she had the urge to engage in inappropriate eating. She also employed positive self-verbalizations when she successfully resisted the urge to eat inappropriately.

Subject 7 was a dorm resident and ate on a three-meal per day food contract in the dorm cafeteria. She decided that her terminal behavioral goal was to lose ten pounds by reducing her caloric intake substantially and by instituting an exercise program to increase her caloric output. Her baseline data revealed that she ate most when lonely or depressed and snacked most frequently when studying. She also discovered that when she ate breakfast, she had fewer snacks and
ate less at other meals during the day. Thus, she decided to alter these controlling stimuli in an appropriate manner. Whenever she was depressed, she engaged in an activity incompatible with eating, such as playing tennis, running, bicycling, walking, etc. To combat overeating when lonely, she did not eat any meals alone. She also began to eat breakfast regularly in order to "curb" her snacking behaviors during the rest of the day. Since studying was a necessary and appropriate behavior and seemed to trigger "snacking," she kept appropriate snacks (raw fruits and vegetables, sugar-free pop, and other diet snacks) handy during this time. She also avoided walking by a local "deli" where she had previously purchased ice cream, pastries, and pop.

An analysis of her eating behaviors also revealed that she took "seconds" at every meal (because it was allowed on her meal contract) and that her daily caloric intake was 1,861. In order to facilitate a weight loss, she decided to maintain her daily caloric intake at 1,300 calories and to expend an average of 500 calories daily in vigorous running. During the course of her self-management project, she was a member of the Women's Lacrosse Team which practiced three times per week for two hours each time. In addition to this activity, she ran two days per week to help her maintain a consistent caloric expenditure.

She utilized the token economy system for weight control to establish effective weekly reinforcement for appropriate eating behaviors. She also set aside a small amount of money ($3.00) each week that she earned 100 points. This money was to be used to purchase
a new bathing suit.

Like Subject 5, she too used signs and pictures depicting the consequences of appropriate and inappropriate eating behaviors to remind her of her terminal goal. She also employed a covert self-control technique involving coverant pairs, a major strategy developed from Homme's [1965] coverant model. Coverant pairs are intended to break a typical behavioral chain involving behaviors with immediately gratifying consequences. As an example, when Subject 7 went through the cafeteria line, the temptation to take a dessert was strong and compelling. Whenever she experienced this urge, she would subvocalize a statement regarding the negative consequences of having dessert, followed by a statement emphasizing the positive benefits of resisting the urge to eat a dessert.

Subject 8 lived at home and ate most of her meals with her family. She decided to lose ten pounds and to change her eating habits during the course of her self-management project. During the baseline phase of her study, she discovered that her eating was related to the following circumstances: (1) excessive snacking involving inappropriate foods; (2) rapid consumption of food; and (3) remaining at the table with her family after she had finished eating and having "seconds." In order to alter her setting events, she decided to make inappropriate snacks (chips, candy, pop, pastries, etc.) inaccessible and to make appropriate snacks (raw fruits and vegetables) more accessible. This was accomplished by having her mother agree to purchase only appropriate snacks and by not carrying change which would allow her to purchase snacks from vending machines.
To modify the rate which she ate her meals, she decided to place her fork on the table between bites of food. She also excused herself from the table when she finished eating in order to avoid the temptation to have "seconds."

By using the token economy system described in Chapter III, Subject 8 was able to establish immediate consequences. This required her to define carefully "appropriate" and "inappropriate" snacks, establish an activity program, and establish a criterion ceiling for caloric intake. Baseline data revealed that her initial weight was 165 pounds and her average daily caloric intake was 2,041. She decided to set her daily caloric intake at 1,300 per day. In addition, she bicycled three times weekly at a daily rate of thirty miles per hour for thirty minutes.

In order to focus on the relationship between her eating behaviors and their consequences, she placed appropriate messages and pictures at conspicuous places throughout her home. She also reinforced and punished her eating behaviors covertly with use of appropriate self-verbalizations.

The self-management projects of the next seven subjects involved improving the quality and the quantity of their studying. They expressed a general concern for their poor use of time, their inability to carry-out goals effectively, and their difficulty in studying consistently on a daily basis. Although the GPA's of these students varied widely, they all expressed a concern for the effect of poor study habits on their school performances. It was decided that these subjects would be divided into two groups of three and four...
to facilitate analysis of the intervention package employed. Multiple baseline designs were used with both groups and treated as replications of the same study.

These subjects employed the same general intervention package used by the majority of the subjects in this study. Following the baseline phase of their studies, they established what appeared to them to be a reasonable amount of time to study per week and per day.

As a result of interviews conducted with each subject, it was apparent that all of the subjects had the following problems in common: (1) they rarely set definite goals as to what they should study; (2) they did not study at a designated time each day for a certain amount of time; (3) they did not have one particular place where they studied; (4) they never consciously reinforced any of their study habits; (5) they were easily distracted, quickly became restless, and day-dreamed frequently when studying; and (6) they all studied an average of less than ten hours per week. Since the control of their study habits appeared to involve the same basic variables, each subject altered these controlling variables in the following manner: (1) each wrote a list of objectives for each day; (2) each set aside a specific time each day for studying; (3) each set a daily goal for the amount of time he should study; (4) each designated one quiet place at home and one place at school where only studying took place; (5) each used a token economy point system for appropriate use of time to reinforce study-related behaviors; (6) each used a study guide prepared by the instructor to help him study more efficiently; and (7) each gradually shaped his length of study episodes.
They established effective weekly consequences via a token economy system. With this system, they earned points contingent upon their performing behaviors felt to contribute to the effective use of their time. Two of the most highly prized behaviors that they performed with this system were establishing and achieving daily goals and studying a designated amount of time each day. Following the baseline phase, each subject established what appeared to him to be a reasonable amount of time to study per week and per day.

Each of the seven subjects focused on the contingencies of his behaviors in a slightly different manner. And each subject applied the principles of covert self-control to regulate his own study behaviors as he saw desirable. The self-management projects involving study behaviors are described below in terms of the same variables as those of the other subjects in the overall study.

Subject 9, like the others in this group, was concerned with her poor use of time. She seldom set definite goals regarding her studying, was easily distracted when attempting to study (by others and by daydreams), and complained of feeling anxious about most of her school work. An examination of her baseline rates of studying revealed a daily average of .85 hours per day. Before intervening, she set two hours as her target amount of studying each day. In order to shape this behavior gradually, she began studying for fifteen minute intervals followed by a short break of five minutes. Her study time was gradually increased to one hour. By the end of the project, her goal was to study a minimum of one hour in the morning and one hour in the evening. She wrote notes to herself and
placed them in conspicuous places to remind her of her goals. Covert self-praise was used whenever she achieved both mini-goals and long-term goals. Other tangible reinforcers used by this subject were: (1) playing with her younger brother; (2) attending to her plants; (3) seeing her boyfriend; and (4) talking to a friend on the telephone.

Subject 10 was concerned with the amount of time she wasted sleeping or napping daily. She discovered that she was sleeping nine to ten hours per night in addition to a one hour daily nap. She reported that everytime she attempted to study, she became sleepy. In addition to the stimulus control techniques employed by the others in this group to alter setting events, Subject 10 felt that she must break the automatic chain between studying and sleeping. To begin with, she reduced the number of hours she slept to a maximum of eight, eliminated naps, studied when she was most alert and did no studying in her bedroom. She established a study area in which there was only one piece of furniture, a desk, and set up short periods of study followed by immediate consequences (a short break). Whenever she had the urge to quit studying and take a nap, she immediately engaged in a behavior incompatible with sleep...jogging. If she was able to resist the urge to nap and to continue studying, she used covert self-praise. She also verbalized the negative consequences of failing to get her school work and other goals accomplished because she slept too much. In addition to covert reinforcement, this subject made sleep contingent upon studying a specific amount of time and made seeing her boyfriend, going to a movie, playing tennis, and going out to dinner contingent upon earning a set number of points with the
token economy system. Notes written to herself in various places throughout the house reminded her of the positive consequences of achieving her daily goals, including studying a designated amount of time each day. She set two hours as her daily study time.

Subject 11 complained about her lack of motivation to study except when under the pressure of a forthcoming exam or an assignment due the following day. She also felt that she did a minimum amount of work for each of her classes. Her average baseline rate of studying was forty-two minutes per day, although it varied from zero to two hours per day, depending upon particular class assignments. Subject 11 decided that she should set as her goal two hours of study per day.

In order to facilitate the accomplishment of this goal, she used the stimulus control techniques described earlier in this section. Short-term reinforcement consisted of a cup of coffee or a short study break and long-term (weekly) reinforcement included visiting a friend, going to a sporting event, buying a new record, and setting aside one day of the weekend in which to do no school related work. Positive self-verbalizations were used to reinforce the accomplishment of daily goals as well as desirable performances on exams. Subject 11 solicited the help of her roommate (an industrious student who studied regularly) to remind her of the negative consequences of not studying and the positive consequences of organizing her day to include time for studying. She also verbalized to herself the positive correlation between effective studying and school performance.
Subject 12 expressed grave concern for his lack of ability to organize his life effectively. He claimed that he had never been a good student and attributed his failures to his inability to set and achieve meaningful goals. This subject had just "gotten by" throughout high school by doing only what was required to pass. He never acquired any effective techniques for studying and, consequently, avoided it whenever he could. Assignments were always done in a hurry the night before they were due, and exams were prepared for in similar fashion.

An analysis of his baseline rate of studying revealed that he studied an average of forty-two minutes per day. His total amount of study time for the six day period was four hours. Studying, like many other behaviors, may require gradual shaping toward a terminal objective. It is not likely that a person could go from studying forty-five minutes per day to three hours per day even with the best designed self-management program. Thus, this subject set one and one-half hours as his daily goal and ten hours per week as his weekly goal.

Daily reinforcement for this subject consisted of either watching T.V. or participating in some kind of physical activity. Weekly reinforcement included setting aside Saturday or Sunday as a "no-study" day, spending time with friends, and going to a sporting event. He made daily reinforcement contingent upon earning twelve points with the token economy system, and his weekly reinforcement was contingent upon earning fifty-five points. This subject used covert self-punishment whenever he failed to achieve his daily goals.
Stimulus control was used to set the occasion for appropriate studying (same for all subjects in this group).

Subject 13 was an average student in terms of her class performance. She felt that she could and should be doing better, however, her biggest problem involved making extra-curricular events a higher priority than her class work. Assignments were postponed until the very last minute. This subject also discovered that she wasted a lot of time during each day. For example, during the eleven-day baseline phase of her study, she studied only ten hours and wasted twenty hours between 8:00 A.M. and 11:00 P.M. She defined wasted time as time in which nothing constructive was attempted.

In order to alter those events which were controlling her study behaviors she employed the stimulus control techniques discussed earlier. She established two hours per day as her study time and set her daily reinforcement criterion at thirteen points. She did not rely upon weekly reinforcement because she felt it was too delayed to be effective in changing her future behaviors. In order to remind her of the contingencies operating on her behavior, she wrote notes to herself and purchased a poster which read "They can because they think they can." Her use of covert self-control consisted of self-praise statements following the accomplishment of an important daily task.

Subject 14 described her problem as poor use of time. She was involved in a number of dorm activities which consumed a specific amount of time per day and week. Because she rarely organized her time or planned for the things that she had to do, she found herself wasting a lot of time. Consequently, her school work suffered. She
never seemed to have enough time to do everything she was committed to do. An analysis of her seven-day baseline data revealed that she studied eight and one-half hours and wasted twelve hours between 8:00 A.M. and 11:00 P.M. For this subject, the most important aspect of the token economy system became the points she earned for writing and accomplishing a list of daily objectives. She set her initial daily study time at three hours per day but had to change this to two hours after the first week. She realized that it was unwise to attempt to triple study time in a matter of one week. She made daily reinforcement contingent upon earning thirteen points. Daily reinforcers for this subject consisted of watching T.V., playing pinball, going for ice cream, listening to a record, talking on the phone, or writing a letter. She established no weekly reinforcements because she felt that her behaviors would be maintained best on a daily basis. She focused on the contingencies of her behaviors by using covert verbalizations of the consequences of falling farther behind and achieving a low grade. She also used covert reinforcement when she achieved her daily objectives.

Subject 15's primary objective was to study on a regular basis in order to avoid falling behind or "cramming" before exams. Her baseline rate of studying was six and one-half hours for ten days, or about forty minutes per day. She established a two-hour daily minimum criterion level for studying. This subject made daily reinforcement contingent upon earning twelve points with the token economy system described earlier. She reinforced her behaviors with extra time with her boyfriend each day. Notes containing the positive benefits of
studying appropriately were written and placed throughout the subject's apartment. Covert praise statements were subvocalized whenever she accomplished a daily goal.
CHAPTER IV

RESULTS

Each of the fifteen subjects in this study conducted a personal self-management project involving a specific aspect of his behavior. Data were collected and graphed daily by the subjects themselves relative to the target behaviors they identified. For subjects who chose to modify the same behavior(s), a packaged treatment was employed and the analysis of the self-collected data was made by multiple baseline across subjects. Two subjects (Subject 1 and 2) chose problem behaviors which no other subjects chose; thus, the analysis of their data was made by separate designs--an ABA for Subject 1 and a changing criterion for Subject 2.

The behavior profiles and personal self-management projects of each subject are described and discussed in the following section. In cases where a multiple baseline analysis was made across subjects, the results of each individual study are analyzed first in terms of the terminal behavioral goals established by the subject. The significance of the behavioral change realized by each subject is discussed in light of the opinions of both the subject and the investigator.
Subject 1

Subject 1 chose to modify her nail biting behaviors. For a period of nine days she collected baseline data relative to the number of times she bit or picked at her nails, as well as the circumstances surrounding these behaviors. In order to set the occasion for consistent collection of data by this subject, weekly meetings were held with her for the purpose of discussing her data and examining her nails (product assessment). An analysis of her baseline data (Figure 1) reveals that she engaged in the problem behavior(s) an average of 7.0 times per day. During the intervention phase of her study (described in Chapter 3), which lasted twenty-eight days, she continued to observe and record instances of nail biting. After the first week of intervention, her average daily rate decreased to 4.29. Following week two, the rate had dropped to 2.29, and by the end of the third week, the rate was only 1.43. After the final week of intervention, the subject had decreased her rate of nail biting to .71. The average rate during the entire twenty-eight day intervention period was 2.2. Following the intervention phase, a maintenance phase was instituted in which all intervention contingencies were terminated. The subject continued to observe and record data in order to determine whether or not she would be able to maintain intervention levels of behavior. An analysis of this thirteen-day period reveals that she continued to decrease her rate of nail biting. Her average daily rate during this phase was .5. An analysis of Figure 1 reveals a steady decrease in nail biting from the baseline conditions.
Figure 1. Record of the Instances of Nail Biting by Subject 1.
Although this subject employed a package intervention consisting of four self-management strategies, she attributed most to her success of the technique of self-observation. As the research evidence indicates, self-observation is often a highly reactive data collection tool and serves as a cue to remind the individual of the target behavior. This subject reported that "just knowing that I was observing my own behavior had the effect of decreasing that particular behavior."

Because self-observation is not an unobtrusive measurement, it is often difficult to obtain stable baselines when this data collection technique is employed. This is somewhat evident in Figure 1, which depicts this subject's baseline data.

Table 3 provides the baseline, intervention, and maintenance means, as well as the percentage of changes in terms of the baseline levels for Subject 1.

Although dramatic changes occurred with Subject 1, it would be difficult to demonstrate causality in terms of the intervention employed. In order to demonstrate a cause-effect relationship between the independent and dependent variables in this study, removal of the intervention would have to have resulted in a return to baseline rates. In studies where significant personal changes have been realized, it is not uncommon to find that these behaviors are no longer dependent upon the intervention that changed them. In this case, the naturally occurring reinforcement resulting from observing continual changes and improvement is likely to have maintained this subject's behavior at below intervention level. Even though the magnitude of change is reported and noted to be significant by the subject and by the
### TABLE 3
### MEANS, CHANGES, AND PERCENTAGE OF CHANGE FOR SUBJECT 1

<table>
<thead>
<tr>
<th>Mean Behaviors</th>
<th>Changes</th>
<th>Percentage of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline to Intervention</td>
<td>Intervention to Maintenance</td>
</tr>
<tr>
<td>Baseline</td>
<td>7.0</td>
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<tr>
<td>Intervention</td>
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<tr>
<td>Maintenance</td>
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investigator, nothing further can be stated with regard to the effectiveness of the intervention package in this case.

Subject 1 indicated, via the questionnaire administered at the completion of her project, that she felt very satisfied with the results of her study. This subject now feels competent to handle another self-management project and intends to undertake one in the near future. She stated that she is convinced that a systematic approach to self-management is more effective than merely calling upon your "willpower" or some other inner force.

Subject 2

An analysis of the data collected and graphed by Subject 2 relative to his cigarette smoking was made via a changing criterion design. The subject instituted a response-cost intervention in which he gave up $1.00 for every day that he exceeded the criterion level established prior to the beginning of the intervention phase of his study. His baseline data reveals that he smoked an average of 14.3 cigarettes per day. Thus, his initial criterion ceiling was established at fifteen cigarettes. At regular specified intervals, the criterion was lowered until it became zero. After the criterion reached zero, a seven-day maintenance phase was instituted. An analysis of Figure 2 reveals that the subject exceeded the maximum line criterion on Days 16 and 29. After the response-cost contingency was in effect for thirty-four days, the subject had ceased smoking entirely. This observation was verified during a maintenance phase. Subject 2's friends also corroborated the fact that he had quit smoking. Because smoking can occur in a wide variety of settings during a twenty-four
Figure 2. Record of the Number of Cigarettes Smoked Daily by Subject 2.
hour period, reliability checks were virtually impossible for this subject. Instead, weekly checks of the self-collected data were made by the investigator to insure the successful completion of this study. In addition, the investigator checked the number of cigarettes in the possession of the subject on three randomly selected occasions during each week. This was done to determine if he had more cigarettes in his possession than his criterion called for that day.

With the use of a changing criterion design, causality is demonstrated when behavior matches a criterion which is set for reinforcement or punishment. When the criterion is changed (made more stringent), the effect of the contingency is demonstrated if the behavior appears to match the new criterion. With the exception of the two days he exceeded the criterion ceiling, his smoking behaviors seemed to change in response to the criterion established. This suggests that the experimental contingencies were responsible for the changes noted. This design, however, is probably the weakest of the three designs used in this study. With a changing criterion design, it is difficult to control extraneous events which could account for noted behavior change. In addition to the response-cost technique which was in effect, Subject 2 facilitated his self-management efforts with the use of the four-technique intervention package described in Chapter III.

Subject 2 indicated in his evaluation that his project was a definite success as far as he was concerned. He also commented that as a result of controlling this aspect of his behavior, he intends to use these skills to modify other aspects of his behavior. He is satisfied that, with the right program, one can control almost all of his
Subject 3 employed a treatment package consisting of thought-stopping and a positive intervention to decrease her negative thoughts and behaviors and to increase her positive thoughts and behaviors. An examination of Figure 3 reveals a baseline average of fifteen negative behaviors and 8.4 positive behaviors per day. During the thought-stopping phase, which was designed primarily to decrease negative behaviors, Subject 3's level of negative behaviors dropped to fourteen, while her positive behaviors increased to 10.2. The purpose of the positive intervention phase was to increase positive behaviors. During this period, her positive behaviors were maintained at 10.1, and her negative behaviors continued to decrease to an average of 8.7 per day. During a follow-up or maintenance phase in which all intervention was removed except continued self-observation, her negative behaviors increased slightly to 9.8. Interestingly, however, her positive behaviors increased during this phase to 11.4. Apparently, once she had begun to make significant gains in terms of the number of positive thoughts and behaviors that she had during the other phases of her study, she was sufficiently reinforced to continue to increase these behaviors. Table 4 illustrates the baseline, intervention, and maintenance means, as well as the percentage of change in terms of the baseline level for Subject 3.

The percentage of change noted in Table 4 reveals that Subject 3 was unsuccessful in reaching her terminal behavioral goal. She expected to reduce by 50 percent the number of negative thoughts and
Figure 3. Positive and Negative Behaviors of Subject 3.
<table>
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<td>8.4</td>
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behaviors in which she engaged daily and to increase by 50 percent the number of positive behaviors. The difference between the baseline rate and the maintenance rate of negative behaviors is -35 percent. This represents a substantial reduction, but it is not significant in terms of the subject's initial goal. There was a 36 percent increase in positive behaviors, but this, too, was not a significant gain in terms of the subject's goal.

Subject 3 indicated in her evaluation that she felt only moderately successful with her personal self-management project. From the very beginning of the course, she was relatively skeptical of her ability to change this aspect of her behavior and expressed concern with what she termed a "mechanistic" approach to behavior change. It was, indeed, difficult to convince this subject that being systematic about one's own behavior does not render him mechanical, impersonal, or dehumanizing. She gradually came to appreciate the intimacy required to objectively evaluate and systematically alter her own behavior. As she indicated, however, she was well into her study before the collection and analysis of personal data emphasized this crucial point. Her initial skepticism, no doubt, retarded her early attempts to change her behavior. By the end of the study, she was convinced of the merits of self-observation, but she still had some reservations regarding the behavioral interventions that she employed. Thought-stopping appeared to her to be an effective way to avoid tempting thoughts and behaviors, but she felt that the cueing procedure used in the positive intervention phase of her study was questionable. She did not feel that the emission of a positive thought or
behavior when cued by the "smile" pin on her watch was a "genuine" expression of a positive disposition. She did indicate, however, that by "thinking" positively, she engaged in fewer "negative" thoughts during this phase of her study.

In light of the above facts, the investigator is relatively satisfied with the results of this subject's study. Prior to the institution of the intervention techniques, this subject was engaging in 44 percent more negative behaviors than positive ones. By the end of the maintenance phase, she was engaging in 14 percent more positive behaviors than negative ones. Although her negative behaviors were not reduced as substantially as the investigator had expected, Subject 3 did reduce them from the baseline rate. She also improved her positive behavioral disposition in this regard.

**Subject 4**

Subject 4 employed the same intervention techniques as Subject 3 in modifying her positive and negative thoughts and behaviors. For a period of ten days, she collected baseline rates on both positive and negative behaviors. Her average daily rate of negative behaviors during this time was 19.7 and her rate of positive behaviors was 7.8. A ten-day thought-stopping phase resulted in a decrease in negative behaviors to a daily average of 11.1. Positive behaviors during this phase were maintained at baseline rates (7.9). Following the institution of the positive intervention, her negative behaviors began to increase somewhat and resulted in an average of 11.8 per day. Positive behaviors increased to 9.8 during this phase of the study. During a fifteen-day follow-up phase, the subject continued to collect and
Figure 4. Positive and Negative Behaviors of Subject 4.
record instances of the target behaviors. Negative behaviors decreased during this phase to an average of 9.2 per day, while positive behaviors increased only slightly to 9.9 per day.

An examination of Table 5 reveals the mean changes and percentages of change between the various phases of this subject's study. Although she was not successful in increasing her positive behaviors to meet her terminal goal of 50 percent increase, she did increase them by 27 percent, from an average of 7.8 to 9.9 per day. She successfully reduced her negative behaviors, however, by 53 percent, from 19.7 per day to 9.2 per day. During the baseline phase of her study, she was engaging in 60 percent more negative behaviors than positive ones. At the end of the intervention phase, she was still engaging in more negative behaviors than positive ones, even though both categories of behavior had been changed in the desired direction. By the end of the maintenance period, Subject 4's negative behaviors had decreased even more. She was slightly more positive than negative in terms of her behaviors. This is somewhat difficult to explain except in terms of the reinforcing effect of continued observation of important target behaviors. Both subjects (3 and 4) described their behavioral problems initially as characterized primarily by excessive self-critical thoughts and behaviors, rather than by a low rate of positive behaviors. They decided, however, to not only decrease negative behaviors, but to simultaneously increase positive ones as well. Subject 4 was more successful in terms of reducing negative behaviors than she was in positive ones. Subject 3 was equally successful with both target behaviors.
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Subject 4 evaluated her self-management project as moderately successful in terms of the goals she had established for herself. She achieved her terminal goal in decreasing negative behaviors, but failed to substantially increase her positive behaviors. Subject 4 was initially much more optimistic than Subject 3 in terms of anticipated success with regard to her study. This may account for the disappointment she expressed with regard to the results of her study, even though she was very successful with half of her project. She did, however, report that she felt more cognizant of her behavior in particular situations and thought that she would be able to continue to make significant gains with her target behaviors.

An analysis of Figure 5 makes causation inferences, based on time-sequenced application of intervention across Subject 3 and 4 somewhat tentative. Although changes occurred with both subjects during all phases of the study, they were less dramatic at particular points with each subject. Negative behaviors of both subjects showed stronger evidence of change through intervention than did positive behaviors. Even though the contingencies of the target behaviors were removed after the Positive Intervention Phase, and no maintenance contingencies were applied, both subjects maintained or improved behavior levels in both the negative and positive categories during the follow-up phase of their studies. This supports the hypothesis of the strong maintenance function of self-initiated behavior change.

In studies involving some measures of covert behaviors, reliability of self-monitoried data cannot be objectively monitored because the subject's response is not available to independent observers.
Figure 5. Negative and Positive Thoughts and Behaviors of Subjects 3 and 4.
Although the credibility of a change in private events is greatly enhanced when public events predicted to be concomitant also change, no attempts were made by the investigator to have the subjects make public their private behaviors during self-observation. Thus, covert and overt behaviors were treated in the same manner. Before these two studies began, each subject clarified the target behaviors with the investigator by providing specific examples of both covert and overt, positive and negative behaviors. It was assumed that, because of the kind of study involved, data would be collected in a reliable manner. Neither subject had anything to gain by "fudging" the data, and both stood to benefit tremendously from the systematic collection and analysis of personal data.

Subject 5

Subject 5 was one of four subjects who implemented the four-technique intervention package described in Chapter III for the purpose of controlling her eating habits and, subsequently, her weight. Her initial weight prior to baseline was 165 pounds. During the baseline phase of her study, she gained one pound. Table 6 provides a daily record of the weight of Subject 5 during her entire study. The initial weight and final weight reported were corroborated by the investigator.

In addition to a product assessment (weight lost), Subject 5 also collected and recorded data relative to an important process measure, daily caloric intake. During the baseline phase of her study, her average caloric intake was 2,388 per day. In order to lose two pounds per week, this subject decided to maintain a daily caloric intake of 1,300 calories. During the first week of intervention, she
### TABLE 6

**WEIGHT MEASURES OF SUBJECT 5**

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<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 5</th>
</tr>
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</table>

| +1 | -2 | 0 | +1 | -1 | 0 |
lost one pound and averaged 1,101 calories per day. Following Week One, she did not lose anymore weight during the remainder of her study, even though she maintained her caloric averages for the next four weeks at 1,152, 996, 899, and 930, respectively (Refer to Table 6 and Figure 6). During her study, she was quite physically active as a runner for the Ohio State Women's Track Team which practiced daily.

In addition to caloric intake and weight loss, Subject 5 monitored the kind of food that she ate (See Figure 7). Prior to her study, she defined "junk food" and "appropriate food" and made a list containing examples of foods in each of these two categories. She was concerned with improving the quality of her diet as well as the quantity of it. For every item consumed, she recorded either one "junk food" or one "appropriate food." During the baseline phase of her study, Subject 5 recorded an average of 5.33 junk food items and 4.33 appropriate food items in her daily diet. During Week One of the intervention phase, she averaged 3.29 junk food items and 3.86 appropriate food items. In Week Two, she continued to decrease the amount of junk food that she ate to an average of 2.57 items per day, while her appropriate food averaged 3.57, a slight decrease from Week One. During Week Three, junk food averaged 2.43 and appropriate food increased to an average of 3.86. During Week Four, there was a marked contrast between the number of junk food items and appropriate food items consumed. Junk food decreased to 1.43 per day, while appropriate food increased to 5.0 per day. This pattern continued during the last eight days of the study, with junk food averaging 1.0 per day and appropriate food increasing to 6.25 per day.
Figure 6. Daily Caloric Intake of Subject 5.
Figure 7. Junk Food and Appropriate Food Consumed Daily by Subject 5.
An analysis of Figure 6 reveals that Subject 5 was successful in maintaining a daily caloric intake far below the criterion ceiling of 1,300 calories which she established prior to the institution of the intervention. It should follow from this analysis that she was also successful in losing the ten pounds she set as her target weight loss for the five-week study. However, as mentioned before, she lost only one pound, even though her caloric intake was drastically reduced. During the course of the study when it became apparent to the investigator that there might be a physiological explanation for her failure to lose weight, she sought the consultation of a university physician. He began conducting a series of tests because he suspected that she may have a thyroid condition. The doctor did not recommend that she abandon her weight program during this period of testing, however. The tests were still being made when the study was completed, so no definite conclusions can be drawn relative to this problem. The subject expressed concern in her evaluation that she was unsuccessful in her attempt to lose weight, but attributed this failure to her medical problem.

Subject 5 was successful in improving the quality of her diet. Figure 7 substantiates a significant improvement in the kind of food that she consumed daily. She was able to reduce her junk food eating by 81 percent and to increase her eating of appropriate kinds of food by 30 percent. She evaluated this aspect of her weight control program very favorably. Gains in this area were judged to be significant by both the subject and the investigator. As consequence of achieving success with this part of her study, Subject 5 expressed optimism with
the prospect of losing weight once her medical problem was corrected. 

**Subject 6**

Subject 6 was the second member of the self-management weight control program. She began her study weighing 134 pounds and consuming an average of 1,605 calories per day. Following an analysis of her baseline data, she decided to maintain her caloric intake at 1,000 calories per day and to set six pounds as her terminal weight loss goal. She expected to lose one pound per week during the intervention phase of her study. This subject implemented the same intervention package as the other subjects in the weight control group.

Table 7 and Figure 8 provide the raw data used in the following analysis. After one week of intervention, Subject 6 had lost two pounds and had decreased her average daily caloric intake to 1,012. During Week Two, she continued to decrease her caloric intake to an average of 734 per day and lost another pound. Her caloric intake increased somewhat during Week Three to an average of 1,038 and she failed to lose any weight this week. During Week Four, she maintained her caloric intake to 1,003 and lost one pound. By the end of Week Five, Subject 6 had decreased her average caloric intake to 751 and had lost one more pound. During Week Six, she maintained a low caloric intake of 764 per day and lost an additional pound. During the entire seven-week program, she lost a total of six pounds.

In addition to regulating her caloric intake and losing weight, Subject 6, like Subject 5, improved the quality of her diet. She defined and monitored "junk food" consumption and "appropriate food" consumption (See Figure 9). Her seven-day baseline reveals that she
TABLE 7
WEIGHT MEASURES FOR SUBJECT 6

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<th>Baseline</th>
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| 0        | -2     | -1     | 0      | -1     | -1     | -1     |
Figure 8. Caloric Intake of Subject 6.
Figure 9. Junk Food and Appropriate Food Consumed by Subject 6.

Legend:
- JUNK FOOD
- APPROPRIATE FOOD
ate an average of 7.0 junk food items per day. During this same period of time, she averaged only 1.29 appropriate food items. After her baseline period, Week One of the intervention phase resulted in a decrease in junk food eating to an average of 3.0 items per day, while her appropriate eating increased to an average of 2.14 items per day. During Week Two, she continued to reduce the number of junk food items that she ate daily. Her average for this week was 1.14 and her average appropriate items for this same period decreased slightly to 1.43. During Week Three, she made dramatic improvements in her eating habits. Her average daily consumption of junk food remained relatively stable at a low of .86, while her appropriate food average increased markedly to 5.43. She continued to increase the number of appropriate items that she ate during Week Four to an average of 7.71 per day, while simultaneously maintaining her consumption of junk food to 1.0 per day. During Week Five, her appropriate food average decreased to 5.29, but increased again during Week Six to 7.57 per day. During Week Five, her junk food average continued to drop slightly to a low of .29 and was maintained at that level during Week Six. These changes in her eating habits represent a 96 percent decrease in junk food eating and an 83 percent increase in appropriate eating.

An examination of the multiple baseline data graphed for Subjects 5 and 6 in Figure 10 reveals a noticeable reduction in junk food eating for both subjects following the implementation of the intervention. The increase in appropriate eating, however, seems to be more a function of time than institution of the intervention.
Figure 10. Junk Food and Appropriate Food Eaten by Subject 5 and 6.
Subject 6 evaluated her study as very successful, both in terms of the weight that she lost and in terms of the improvement that she made in the quality of her daily diet. She was one of the most successful subjects in the weight control program with regard to both product and process variables. As a result of the success that she achieved with her project, she fully expects to continue implementation of the intervention package in order to maintain the goals that she realized. She also expressed delight over the possibility of using the self-management skills that she learned to establish an exercise program for herself in the near future.

Subject 7

Subject 7 was the third member of the self-managed weight loss group. She began her baseline phase weighing 156 pounds and ended this phase at 155 pounds, a loss of one pound. Her terminal weight loss goal was set at ten pounds for the five-week intervention period. Figure 11 establishes her average daily caloric intake during baseline at 1,861. Following the baseline phase of her study, a criterion ceiling was set at 1,300 calories per day by Subject 7. She also instituted a three-day per week running program in order to increase her normal caloric output. After the first week of intervention, Subject 7 had lost two more pounds and had averaged 1,372 calories per day. During the second week, she lost two pounds, while maintaining a daily caloric average of 1,196. She did not lose any weight during Week Three and increased her caloric intake slightly to 1,257.

During Week Four, her caloric intake was maintained at 1,219 and she lost one more pound. During the last nine days of her study,
she lost one pound and averaged 1,177 calories per day. Table 8 provides a daily record of her weight during the entire program. An analysis of this table reveals that she succeeded in losing a total of seven pounds, three pounds less than her goal. Although she was relatively successful in adhering to her criterion level of caloric intake, her caloric output was apparently not great enough to cause as much weight loss as she had expected.

Although she did not achieve the terminal goal she set for herself with regard to weight loss, she felt that she was successful in managing those variables she thought were controlling her eating habits and her weight. She determined that without decreasing her caloric intake further, she would have to increase her caloric output by approximately 500 calories per day. This appeared to her to require an activity program beyond that which she could implement at this time. Instead, she decided that it would be far more realistic in the future to maintain her caloric intake at 1,300 calories per day and to be satisfied with a one pound weight loss per week. An examination of Figure 11 reveals a sharp decline in average daily caloric intake following implementation of the intervention package. This data will be analyzed via a multiple baseline graph following a discussion of the fourth and final personal project in the weight control program.

Subject 8

Subject 8 was the final member of the self-managed weight control group. She implemented the same four-technique intervention package as the others in the program. Her initial weight prior to beginning her baseline phase was 165 pounds. During the baseline
Figure 11. Daily Caloric Intake of Subject 7.
TABLE 8
WEIGHT MEASURES FOR SUBJECT 7

<table>
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period, her weight fluctuated from 165 pounds to 163 pounds. She ended the baseline phase weighing 163 pounds, a loss of two pounds during this period. Her average caloric intake per day during baseline was 2,041. Subject 8's goal was to lose ten pounds by maintaining her daily caloric intake during intervention at 1,300 calories. In addition to regulating her caloric intake, she instituted a three-day per week bicycling program in order to increase her normal caloric output each day. During the first week of the intervention phase, she consumed an average of 1,358 calories and lost two pounds. In Week Two, her average daily caloric intake was 1,464, and her weight decreased to 160 pounds, a one pound weight loss. Week Three resulted in a one pound weight loss and an average daily caloric intake of 1,424 calories. During the last nine days of the study, Subject 8 lost two more pounds while maintaining her caloric intake at an average of 1,385 per day.

By controlling those variables of which her eating behaviors were a function, Subject 8 was successful in regulating her weight. Although she did not lose ten pounds as she had initially expected, she did lose eight pounds and reported feeling satisfied with these results. At the conclusion of her study, she indicated that she felt competent to continue her weight control program until she had lost an additional fifteen pounds. She also reported being eager to undertake new self-management programs to alter other aspects of her behavior.

A multiple baseline analysis of the data for Subjects 5, 6, 7, and 8 is provided in Figure 13. Causation is inferred from the noticeable decrease in caloric intake for each subject at the time the intervention package was instituted. Although each subject varied in terms
Figure 12. Daily Caloric Intake of Subject 8.
### TABLE 9

**Weight Measures for Subject 8**

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| Difference | -2 | -2 | -1 | -1 | -2 |
Figure 13. Caloric Intake of Subjects 5, 6, 7, and 8.
of the amount of weight loss, the impact of the intervention techniques on caloric intake is readily observable from trends found in Figure 13.

Subjects 9-15 were all involved with a self-managed study program. For purposes of analysis and comparison, each subject employed the four-technique intervention package with a token economy described in Chapter III. Subjects 12, 10, 15, and 9 were grouped to facilitate the use of a multiple baseline analysis, while Subjects 14, 11, and 13 comprised the second group of self-managed individuals. The subjects were divided into groups on a random basis following the identification of their problem behavior.

Subject 9

Subject 9 began her study by collecting a twelve-day baseline reading in order to determine her average daily rate of studying during that period. An analysis of this data reveals that she studied an average of .85 hours per day during baseline. One of her goals was to organize her time more efficiently so that she could study a specified amount of time each day rather than "cram" one day and not study at all the next day. She determined that two hours per day was a reasonable amount of time in which she could accomplish her daily goals. Like the others in the self-managed study group, she used the four-technique intervention package and established effective long-term and short-term consequences via a token economy system (See Appendix H).

Following the first week of intervention, Subject 9 increased her daily study average to 2.03 hours. During the first week she studied a minimum of two hours per day on four days and accomplished
her daily objectives on only two days of the week. She increased her study average slightly to 2.15 hours and studied a minimum two hours per day on six days of Week Two. During Week Two, she also established and accomplished a list of daily objectives on four days of the week. There was more fluctuation in her study program during Week Three. She averaged 2.4 hours per week but studied the minimum two hours per day on only four days of the week. During this week, she accomplished her daily objectives on five days of the week. The fourth and final week of intervention resulted in a daily average of 2.0 hours. She studied two hours per day on five days and accomplished her daily goals for four days.

By referring to Table 10, you will note that Subject 9 increased her daily amount of studying time by 147 percent. Her goal was to study regularly each day for a minimum period of two hours. She was successful in meeting this criterion on nineteen of twenty-eight days, or 68 percent of the intervention time. On fifteen of twenty-eight days, or 54 percent of the time, Subject 9 was successful in achieving a list of daily objectives.

Although she continued to fluctuate, as did the other subjects in this group, she was able to maintain a fairly high rate of studying throughout the intervention phase. Of the twenty-eight days in this period, she studied at least forty-five minutes every day except one. This is, indeed, remarkable when compared to baseline rates. During the twelve-day baseline period, she studied a minimum of forty-five minutes per day on only six days, or 50 percent of the time.
<table>
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<th>Subjects</th>
<th>Mean Behavior (Hours Studied)</th>
<th>Change</th>
<th>Percentage Of Change</th>
<th>Number Of Days Met Criterion</th>
<th>Percent Of Days Met Criterion</th>
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Subject 9 evaluated her project as successful. She felt that, in addition to increasing her study time each day, she also improved the quality of her work and organized her time more wisely. The most valuable aspect of her study involved writing and achieving a list of daily objectives. She always included "study time" in her list of objectives. Subject 9's data are graphed in Figure 14 and analyzed via a multiple baseline design across subjects in Figure 21.

Subject 10

Subject 10 instituted an eight-day baseline phase during which she recorded the amount of time she studied daily. The average for this period of time was 1.0 hours per day. She established as her daily goal, a two-hour study minimum. During the first week of her intervention phase, she increased her average to 1.8 hours per day and studied her minimum amount of two hours on five of the seven days. In addition, she accomplished her daily objectives on three days during Week One. During Week Two, Subject 10 continued to increase her daily average to 2.8 hours per day and studied two hours per day on six days of the week. She also increased the number of days in which she accomplished her objectives to seven. She maintained a high daily average of 2.9 hours during the third week and met her criterion on seven days. She accomplished all of her objectives on six days of Week Three. Her studying fluctuated somewhat during the fourth week with her average decreasing slightly to 2.6 hours per day. She failed to reach her criterion level of two hours on only one day that week, while she succeeded in accomplishing her objectives on six days. During the final week, she maintained her study average at 2.6 hours per day.
Figure 14. Number of Hours Studied Daily by Subject 9.
and studied a minimum of two hours per day every day of the week. During Week Five, she accomplished a list of daily objectives on six days.

Subject 10 was successful in increasing her study time from a low baseline rate of 1.0 hours per day to an intervention average of 2.55 hours per day. An examination of Table 11 reveals that this change represents a 155 percent increase. Subject 10 was also able to study a minimum of two hours per day on twenty-nine of thirty-five days, or 83 percent of the time. She was able to realize her daily objectives 80 percent of the intervention time. An analysis of Figure 15 reveals that she failed to study a minimum of one hour per day on only one occasion during her entire intervention phase. This is an important gain in light of the subject's baseline levels of study.

Subject 10 felt that she was very successful in increasing her study time to an appropriate daily level. She reported experiencing less anxiety as the end of the quarter approached because she was "caught up" with her work for the first time. In addition to improving her study habits, she indicated that she has more "free" time due to wise planning and implementation of a list of daily goals. She successfully eliminated her "napping" and excessive sleeping as a result of very carefully structuring her daily activities.

Subject 10's data are analyzed via a multiple baseline design across subjects in Figure 21.

**Subject 11**

Subject 11's nine-day baseline data revealed that she studied an average of .7 hours, or forty-two minutes per day. She set her
Figure 15. Number of Hours Studied Daily by Subject 10.
minimum criterion at two hours per day following the baseline phase. During the first week, Subject 11 increased her average, but did not reach the two hour criterion. She studied a minimum of two hours per day on only two days of the week and averaged 1.86 hours per day for the entire seven days. She succeeded in accomplishing her daily objectives, however, on six days of the week. She continued to increase her daily average slightly during Week Two to 1.96 hours. On four days she studied a minimum of two hours per day and on three days, Subject 11 achieved her daily objectives. During Week Three, her daily study average decreased to 1.54 and she studied a minimum of two hours per day on only one day that week. She met her objectives twice during Week Three. During Week Four, she made her most significant gains by increasing her daily average to 2.11 hours and satisfying her criterion on five days of the week. During Week Five, she averaged 2.29 hours per week and achieved her criterion on six days of the week. In addition, she accomplished her daily objectives on five days that week.

Table 10 provides pertinent information regarding the behavior profiles of all of the subjects in the self-managed study group. Subject 11 increased her study time by 179 percent and studied a minimum of two hours per day on eighteen of thirty-five days, or 51 percent of the time. On twenty occasions, or 57 percent of the time, she wrote and accomplished a list of daily objectives. Figure 16 provides graphic data of Subject 11's study time. An analysis of this graph reveals that she failed to study on only two occasions during her entire thirty-five day intervention period.
Figure 16. Number of Hours Studied Daily by Subject 11.
Subject 11 felt that the most successful aspect of her study involved the organization of her daily activities. She was able to increase her study time and still have ample time to do other things. Prior to initiation of the study, she complained of not having enough time during the day to accomplish all of the things that she had to do. By the end of the study, she expressed her satisfaction with studying on a more consistent basis each day and with being more organized with regard to the way in which she used her time.

Subject 12

Subject 12 computed his daily study average to be .66 hours, or forty minutes per day during his six-day baseline period. He established a criterion of one and one-half hours daily, which he instituted as part of his intervention phase. During Week One, he increased his daily average to 1.7 hours and studied his criterion on three days. Five days that first week he achieved his daily objectives. He continued to increase his daily average to 2.0 hours during Week Two and studied his minimum amount on six days. He achieved his daily goals on five days during Week Two. Although Subject 12 continued to be erratic in his study pattern, he maintained his average at 2.0 hours during Week Three. He satisfied his one and one-half hour criterion on five days and met his objectives on six days. During the fourth week, he continued to increase his average of 2.3 hours per day. He also managed to study a minimum of one and one-half hours every day of the week. During Week Four, he set and achieved objectives on seven days. After Week Four, his average dropped slightly to 1.9 hours for Week Five. He failed to satisfy his criterion on only one
day that week and achieved his daily objectives on five days. During the sixth and final week, Subject 12 again increased his average to a high of 2.6 hours per day. He satisfied his criterion level every day of the week and achieved his objectives on six days.

Table 10 provides information relative to the behavior profiles of the subjects in the study program. Upon observation, it becomes apparent that Subject 12 made the most significant gains from his baseline level of studying to his intervention level. He increased his average rate of studying per day from .66 to 2.15 hours, a 226 percent increase. His attempts to maintain a criterion of one and one-half hours per day resulted in his doing so on thirty-three of forty-two days, a success rate of 79 percent. He was also able to achieve his daily objectives 81 percent of the time. Figure 17 shows graphically the pattern of studying which emerged with Subject 12's attempts to increase the amount of studying in which he engaged daily. During his six-day baseline, he studied zero hours on four days. During his forty-two day intervention phase, he failed to study on only three occasions.

Subject 12 reported a high degree of satisfaction with the results of his initial self-management efforts. Not only did he increase his overall study time, he was also successful in studying a minimum of one hour on thirty-eight of the forty-two days of his intervention phase. Before beginning his study, Subject 12 said that he only studied or did school-related work on two or three days per week, except just prior to an exam or a big assignment. He was very pleased that his program resulted in his studying on a more consistent basis. Although his pattern of study still shows some extreme fluctuations on
Figure 17. Number of Hours Studied Daily by Subject 12.
occasions, he improved very significantly from his baseline pattern. As a result of a more efficient use of his time and an increase in the time he devoted to school work, this subject found himself more confident when approaching an exam or when completing an assignment. He reported less anxiety as the quarter reached an end than he had felt during previous quarters. Although this subject does not characterize himself as a "scholar" or a potential one, he now feels that he can achieve a 3.0 average next quarter if he establishes effective contingencies at the beginning of the quarter. Prior to initiating his study, Subject 12 was merely satisfied with achieving the minimum GPA.

Subject 13

During the baseline phase of her study, Subject 13 studied an average of .9 hours per day, or fifty-four minutes. Following the collection of baseline data, she set a two hour daily minimum and began the intervention phase of her study. During the first week, she increased her rate of studying to 1.7 hours, which is equivalent to one hour and forty-two minutes. Although her weekly average did not reach two hours, she did satisfy her criterion on four days of the week and met her daily objectives on four days also. During Week Two, her studying behaviors were maintained at the same rates as they were in Week One, while she increased to six the number of days in which she met her objectives. There was a dramatic increase in her studying during the third week. She satisfied her daily study criterion every day and increased her average to 2.8 hours per day. In addition, she achieved her daily objectives on every day of the third week. There
was a slight decrease in study time to an average of 2.6 hours per day during Week Four; however, she still managed to study a minimum of two hours per day every day of that week. She also established and met a list of objectives on each day of Week Four. During the final week of her study, she continued to show an increase in average study time per day. The data collected and graphed during Week Five reveals an average of three hours per day. She maintained a two hour minimum each day and achieved her objectives on each of the eight days of this last period of time.

An analysis of Figure 18 reveals that Subject 13 did no studying on four of her eleven baseline days. During her thirty-six day intervention phase, she failed to study a minimum of one hour on only one occasion. An examination of this subject's study behaviors shows a steady increase in study time from baseline to Week Five. Table 10 provides additional information relative to the changes and accomplishments of this subject. Subject 13 increased her study time by 156 percent and satisfied her criterion level of two hour per day on thirty of thirty-six days, or 83 percent of the time. In addition, she accomplished her daily objectives 89 percent of the time, the highest reported success rate of any of the subjects in this category.

Subject 13 evaluated her program as very successful in terms of both the quantity of her studying and the quality of it. She reported doing better on exams and accomplishing her daily tasks on time, a feat she accomplished rarely before she began her study. Subject 13 was involved with a number of extra-curricular activities and felt that her study resulted in a more efficient use of her time.
Figure 18. Number of Hours Studied Daily by Subject 13.
She was particularly impressed with the effects of writing down and accomplishing a list of objectives every day. This proved to be a valuable aspect of her study.

**Subject 14**

Subject 14's average study time per day during the baseline phase of her study was 1.2 hours. For the first two weeks of the intervention phase of her study, she established a three hour minimum per day. She achieved her criterion on two days during Week One and averaged 1.82 hours per day. During Week One, she achieved her daily objectives on three days. Following the first week, she decided that she should decrease her criterion to two hours per day. During the second week, she increased her average to 2.4 hours per day and met her criterion performance on five days. Her list of daily objectives was met on five days also. During Week Three, she was less erratic in her study pattern, even though her average decreased slightly to 2.14 hours per day. She failed to satisfy her criterion only once and achieved her objectives on six days. There was a marked increase in her average to 3.1 hours during the fourth week of intervention; however, this average does not reflect an extreme fluctuation between one day in which she studied zero hours and one day she studied seven hours. Despite the high average, she did not study two hours per day on two days of Week Four. She was successful in achieving her objectives on six days of that week. She continued to show some extreme variation between days during the fifth week, but maintained her average at 2.8 hours. Except for one day when she studied zero hours, she satisfied her criterion each day. She achieved her daily objectives
Figure 19. Number of Hours Studied Daily by Subject 14.
five days during Week Five.

Upon observation of Table 10, one can see that Subject 14 increased her amount of studying from a baseline level of 1.3 hours per day to an average of 2.45 hours during intervention. This represents an increase of 88 percent, the lowest gain of any of the subjects in the self-managed study group. She succeeded in meeting her two hour criterion on twenty-four of the thirty-five intervention days, or 69 percent of the time. She also established and achieved daily objectives on 71 percent of the days.

Subject 14 complained of not having enough time each day to accomplish all of her necessary tasks prior to initiating her study. In addition to attending school full-time, she worked part-time and administered the intramural program for her dorm. Because of her commitments, she had things to do every day of the week, but often failed to get them accomplished due to an inefficient use of her time. She also complained that her school work was suffering as a result of not establishing any kind of study schedule. At the conclusion of her study, Subject 14 reported feeling good at the end of the day when she had accomplished all of her daily goals, including studying, and still had time left to enjoy being with her friends. Like several of the other subjects in this group, she felt that the key to her success was the reinforcement she received when she was able to realize all of her daily objectives. She found that by writing down everything she had to do or wanted to do each day, she was much better able to achieve her goals.
Subject 15

During the baseline phase of her study, Subject 15 averaged .65 hours of study per day. As a result, she set her daily minimum at two hours per day. During the first week of her planned intervention, Subject 15 increased her average markedly to 2.2 hours per day. She met her criterion level on five days and achieved a list of daily objectives on three days. By the end of Week Two, her average had decreased to baseline rates of .65 hours per day, while she maintained the number of days in which she achieved her daily objectives at three. During Week Three, she increased her average to 1.4 hours per day and satisfied her two hour minimum on three days. She achieved her daily objectives on six days during Week Three. There was a slight increase in her daily average during the fourth week to 1.5 hours per day; however, she met her criterion level on only two days that week. She achieved her daily goals every day of that week. During the fifth week of her study, she increased her average dramatically to three hours per day and satisfied her two hour criterion six out of seven days. In addition, she maintained the number of days in which she realized her objectives at seven.

An examination of Table 10 reveals that Subject 15 increased her daily study time from .65 to 1.75, a gain of 169 percent. She was, however, only 54 percent successful in studying her criterion of two hours per day. She was more successful with regard to achieving her list of daily objectives. Table 10 shows that on 74 percent of the days, she realized her daily goals.
Figure 20 illustrates the pattern of study which characterizes Subject 15's project. Following her baseline period, she began to make significant gains and increased her average from .65 to 2.2 hours during the first week of intervention. She became ill, however, and was hospitalized on Days 20, 22, 23, 24, and 25. On these four days, she was unable to study or realize any objectives. Therefore, as her graph indicates, she had to play "catch-up" once she was released from the hospital. During the fifth and final week of her study, she had to complete all of her school work that she had missed when she was ill. Except for the four days that she was hospitalized, Subject 15 studied a minimum of one hour per day. She reported feeling satisfied that she was able to accomplish this since her baseline data reveals that she studied one hour per day on only four of the ten days during this period.

Subject 15 was pleased with the results of her attempt to organize her time more efficiently. She felt that budgeting her time allowed her to accomplish those tasks which she needed to accomplish. In addition, she realized the importance of scheduling regular times and periods of the day for studying as opposed to making it peripheral to her other daily tasks.

Prior to the beginning of their studies, the subjects who chose to modify their study behaviors were divided randomly into two groups for purposes of analysis. Figure 21 provides a multiple baseline analysis of Group 1 consisting of Subjects 12, 10, 15, and 9. A staggered baseline allowed the investigator to show the time-sequence of behavior changes in study time (dependent variable) relative to the
Figure 20. Number of Hours Studied Daily by Subject 15.
Figure 21. Hours Studied Daily by Subjects 12, 10, 14, and 9.
manipulated order of the intervention package (independent variable). An analysis of this graph reveals the changes which occurred when the intervention phase was instituted for each subject every two days. Table 11 provides the mean changes and percentage of change which occurred with each subject from the baseline phase to the end of the first week of intervention. This data illustrates the immediate changes made upon implementation of the intervention package.

Except for Subject 10, all of the subjects in this group more than doubled their study time during the first week of the intervention phase. The data strongly suggest that the contingency (intervention) was responsible for the behavioral changes noted with the subjects in this group.

Figure 22 allows a multiple baseline analysis across Subjects 14, 11, and 13. Changes are readily observable for each subject upon institution of the intervention phase of their studies. These changes are reported in Table 12, which also indicates the percentage of change realized by each subject from baseline to the end of the first week of intervention.

And analysis of Table 12 reveals somewhat lower increases for the subjects in this group, compared to those in Group 1. Only one subject doubled his study time from baseline to the first week of intervention. Because of the variability in the data for these subjects, causation inferences based on time-sequenced application of intervention procedures across these subjects are not clearly evident. Significant changes were made, however, by all subjects in this group when they are compared to the criterion goals established by the subjects
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<th>Percentage Of Change</th>
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Figure 22. Hours Studied Daily by Subjects 14, 11, and 13.
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themselves. Each subject set a two hour daily minimum following baseline. The data in Table 12 indicate that all subjects were close to their desired levels of performance by the end of the first week of intervention.

**Summary and Discussion of Personal Self-Management Projects**

When examined as a total group, the majority of the self-management projects were successful in terms of the goals established by the subjects themselves. Some subjects realized more success than others, but every subject made some observable changes in his/her behavior. Because the fifteen subjects did not modify the same behaviors or use the same self-management techniques, causation inferences cannot be made via a multiple baseline analysis across all subjects. Instead, various designs were employed, depending upon the behaviors involved and the number of subjects. Even though Subject 1 was successful in reducing her nail biting by 93 percent, a significant change under most circumstances, causation cannot be demonstrated with the design used with this subject. An ABA (reversal) was used to analyze Subject 1's data. During the maintenance phase of her study, Subject 1 continued to reduce her nail biting to an average of below baseline rates. Because her behaviors did not revert back to baseline levels when the intervention was removed, causation inferences are impossible to make.

A changing criterion design was used to analyze the data on Subject 2. Because his behavior changed as the criterion was lowered,
it appears that the contingencies, rather than extraneous variables, were responsible for the behavior changes. Subject 2 successfully eliminated his smoking behavior, a 100 percent improvement from baseline.

With Subjects 3 and 4, who modified their self-critical and positive thoughts and behaviors, a multiple baseline analysis was made. Because of the variability of their data, causation inferences based on time-sequenced application of intervention procedures across both subjects are not clearly shown. Thought-stopping had little effect on the negative behaviors of Subject 3, but those of Subject 4 decreased dramatically during this intervention period. During the positive intervention phase, the positive behaviors of Subject 3 increased significantly and were maintained during the follow-up period when the contingencies were removed. Subject 4's positive behaviors remained stable during the positive intervention phase, but increased slightly during the follow-up. In order to make clear-cut inferences from the data in these studies, both subjects should have reduced their negative behaviors and maintained their positive ones during the thought-stopping phase. Likewise, both subjects should have increased their positive behaviors and maintained their negative rate during the positive intervention phase.

Subject 3 decreased her negative behaviors by 35 percent and increased her positive behaviors by 36 percent during her study. Subject 4 was successful in increasing her positive behaviors by 27 percent and in decreasing her negative behaviors by 53 percent. Although these percentages do not represent substantial improvements, they are
significant when the difficulties associated with covert behavior changes are taken into consideration. They are also significant gains when evaluated in terms of the goals of these two subjects relative to the behaviors in question.

Subjects 5-8 lost weight by reducing their daily caloric intakes. An examination of Figure 13, a multiple baseline analysis of the data for these four subjects, reveals substantial decreases in caloric intake at the time of intervention. The successful reduction in caloric intake by the subjects in this group can be attributed to the intervention package employed. Table 13 summarizes the behavior profiles of the four subjects in the weight control program.

Except for Subject 5, who had a medical problem, the subjects in this program were relatively successful in achieving their weight loss goal. Each subject successfully reduced her caloric intake substantially.

Subjects 9-15 were involved in a self-managed study program designed to increase the amount of time they devoted to school-related work each day. This was the most successful group in terms of the percentage of gains realized by each subject. The behavior they chose to modify was easily defined and measured. In addition, it involved a very important aspect of the student's university life.

Because the self-managed study programs extended through the last week of classes and into exam week in some cases, the average increase of each subject during intervention would be expected to be greatest toward the end of the quarter. In order to reduce what may be "inflated" increases due to the onset of end-of-the-quarter deadlines,
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the investigator compared the baseline rates of each subject with his rates for Days 20-30, which fell in the middle of the intervention period. Table 14 provides the mean study behaviors, mean changes, and percentage of change for each subject during these periods of the study.

Except for Subject 15 who was ill during the period from Days 20-30, all of the subjects in this group increased their study time during this period of time to levels equal to or greater than the levels for the entire intervention period. This suggests to the investigator that the intervention procedures were responsible for the increases and maintenance of study behaviors rather than extraneous factors, such as final exams and/or final assignments.

**Analysis of Evaluative Questionnaire**

Each of the fifteen subjects completed an evaluative questionnaire at the end of his project (See Appendix C). The questionnaire was open-ended and designed to elicit responses to questions pertaining to the subjects' self-management projects, as well as to the course in general. Their responses are discussed in the following section.

When asked if they regarded their self-management projects as "successful," "moderately successful," or "unsuccessful," thirteen, or 87 percent, of the subjects rated their projects "successful." Two subjects felt that their attempts were moderately successful. No subjects indicated that their projects were unsuccessful. As a result of having taken the self-management course and carried out a personal research study, 87 percent now see themselves as being more in control
TABLE 14

MEAN STUDY BEHAVIORS, MEAN CHANGES, AND MEAN PERCENTAGE OF CHANGE FOR STUDY GROUP

<table>
<thead>
<tr>
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<th>Mean Changes</th>
<th>Percentage Of Change</th>
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<td></td>
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of their own behavior than they did prior to the course. One subject felt somewhat more in control and one indicated that she felt no more in control of her behavior than she did before she took the course. Eight subjects, or 53 percent, felt that they can now control aspects of their behavior they previously felt were beyond their immediate control.

Fourteen, or 93 percent, of the subjects felt that systematic self-observation made them more aware of their own behaviors. They said that they discovered new things about their behaviors and were "cued" to aspects of their behavior they did not know existed. Several felt that self-observation caused them to begin to alter their problem behaviors immediately. Closely related to self-observation was self-recording via graphs. Thirteen, or 87 percent, of the subjects agreed that graphing helped them change their behaviors. When asked to tell "why" or "how" it helped, the following responses were given most frequently:

1. It helped me to isolate "bad" days and determine the reasons for them.
2. It helped me to see my progress and improvement--it encouraged me to see positive changes.
3. It provided me with accurate daily records.
4. I "thought twice" before engaging in the undesirable behavior because I had to record it.
5. I could see where improvements were most needed.

When asked what the most reinforcing aspects of their self-management projects were, most subjects responded with answers such as the following:
1. Seeing positive changes.
2. Keeping points for reinforcement.
3. Social reinforcement for noticeable improvement.
4. Improved "moods."
5. The instructor's interest.
7. A general feeling of being in control of myself.

Sixty-seven percent of the subjects felt that self-reinforcement was very important to the success of their projects. Thirteen percent said it was moderately important, and 20 percent indicated that it was not necessary to the success of their projects.

Studies in the "locus of control" suggest that people who feel that they are their own change agents are more likely to take charge of their own behavior and attribute changes in their behavior to themselves rather than to others. Only 40 percent of the fifteen subjects felt that their success was facilitated by the instructor. Sixty percent felt that they themselves were primarily responsible for the changes they made.

Elementary principles of behavior modification were part of the content of the modularized self-management course. Before they began their projects, the subjects were required to apply these principles to their own behavior in particular situations to see if they could handle the concepts adequately. When asked if they felt that an understanding of these basic principles helped them in their projects, nine, or 60 percent, said that they were very valuable. Twenty-seven percent agreed that these principles were somewhat helpful, and thirteen percent
felt that they could have carried out their projects without any background in behavior modification. Some of the favorable comments by those subjects who felt behavior modification was important to their success are provided below.

1. Without an understanding of these principles, I do not think that I could have completed my project as successfully.

2. Now I can use these principles to help me understand and explain other aspects of my behavior.

3. I found that an understanding of behavior-modification principles helped me to predict my behavior in certain situations more accurately.

4. I think it will be easier to carry out another self-management project now that I can analyze my own behavior better.

Eighty-seven percent of the subjects said that they intend to apply the self-management skills that they acquired in this course to future problems. One student indicated that she had already applied the skills by helping a friend establish a self-managed weight control program. Another said that she is going to help one of her friends quit smoking by teaching her the skills and by helping her set up a self-management program.

When asked for suggestions on how to improve the course, the following kinds of recommendations were given most often.

1. You should begin the self-management course on the first day of the quarter. Collection of personal data should begin earlier in the course.

2. There should be more instructor supervision.

3. Students should be encouraged to select an "easy" problem for their first attempt--should avoid internal problems on the first project.

4. Students should meet together once per week to share data and to discuss their progress with the
instructor and with the others in the course. This would encourage more camaraderie and more social reinforcement. It would also let us see how the skills of self-management are being applied in other projects.

5. The students should meet together to discuss behavior modification rather than try to read and understand it by themselves. It helps to get different interpretations from others relative to what you read.

In summary, the subjects in this study evaluated the course, as well as their personal self-management projects, favorably. Most were very aware of the problems they encountered and indicated that they would be able to solve them better in the future. Their comments indicate that they intend to apply these skills to future problem behaviors because they now see themselves as their own change-agents.
CHAPTER V

DISCUSSION

Summary

During a time in which man is feeling pressure from environmental controls, self-management offers him an escape route. There is little doubt that self-management has survival value, not only for the individual, but for society in general. The ability to control the important events occurring in one's life is probably one of the most important skills an individual could possess in our rapidly changing technological society. It is also true that self-management is desirable if we expect to continue to operate in a society free from constant surveillance by external agents. Man is constantly confronted with critical problematic situations, and he must learn to live effectively in a society in which conflicting environmental contingencies vie for his control.

There is some research [Rotter, 1954] which suggests that individuals who see no contingency between any effort on their part and the end results in particular situations are likely to be passive, apathetic, "you-help-me" individuals. Many social problems facing our society today stem from this experience of a lack of power among many persons. School children evidence faulty emotional and/or behavioral control, and teachers are frustrated daily by their inequalities.
to deal effectively with disruptive children.

Although most of the empirical research in this area has been conducted in therapeutic environments, the current thrust is directed at teaching self-management or a systematic problem-solving approach to normal populations. The current study was an attempt to integrate the self-management skills which have been shown to be effective in laboratory studies with those skills which have been used in studies in natural environments. It was designed to teach undergraduate physical education majors how to apply self-management skills to the modification of aspects of their own behavior which they felt might eventually affect their teaching behaviors. In addition, the investigator wanted to determine the usefulness of a course in self-management for prospective teachers.

The subjects in this study were fifteen undergraduate physical education majors from The Ohio State University who volunteered to participate. The subjects were trained in elementary principles of behavior analysis and taught to apply these principles to their own behavior via a modularized and self-instructional self-management course. Each subject delineated a personal self-management project which required him to specify the problem in behavioral language, identify target behaviors to monitor, collect and graph instances of the target behaviors, implement an intervention package, and evaluate the success of his study. The dependent variables varied considerably from subject-to-subject, dependent upon the target behaviors chosen by each subject.
The independent variable package incorporated specific self-management procedures. Although the package varied slightly for each subject, it generally consisted of the following procedures: (1) altering controlling setting events; (2) establishing effective consequences; (3) focusing on contingencies; and (4) applying covert self-control. Following the completion of their projects, the subjects completed an evaluative questionnaire designed and administered by the investigator.

**Conclusions**

The results of this study suggest that the self-management course was successful in terms of teaching undergraduate physical education majors how to modify their own behavior. In the opinion of the investigator, two-thirds of the subjects conducted successful self-modification projects. These ten subjects achieved rather dramatic changes. The data from Subjects 1, 2, 6, 8, 9, 10, 11, 12, 13, and 14 indicate that they were at least 80 percent successful in achieving their terminal behavioral goals. In addition to analyzing the data for these subjects relative to their goals, the investigator sought personal evaluations from each of them. An analysis of their personal comments and responses on the evaluation questionnaire reveals that they all evaluated their projects favorably.

Subjects 3, 4, 7, and 15 achieved less dramatic behavior changes. Although they expressed some dissatisfaction with the results of their studies, they did realize some behavior changes which they felt were important to them. In some instances, the behavior changes
were less clear and required more subjective evaluation. The important criterion, however, in self-management research is whether the differences in behavior are practical differences which have personal significance. In the case of a personal behavior modification program, this significance is usually determined by the individual himself. These four subjects, while not satisfied with all aspects of their programs, evaluated their projects moderately successful. Two of the subjects (Subject 3 and 4) chose difficult private behaviors to modify. Although they made progress toward their goals, they both felt that additional time was necessary to change this aspect of their behavior. Subject 15 was hospitalized for one week of her study, which explains, to some extent, the difficulties she experienced with her study program.

The data for Subject 5 indicate that she was the least successful in terms of achieving her terminal goal. She established a ten pound weight loss goal, but, unfortunately, due to an undiagnosed medical problem, lost only one pound. Although she reduced her caloric intake substantially, this did not result in the weight loss it should have under normal circumstances. She was successful, however, in improving the quality of her diet. Apparently, there are always some "unsuccessful" aspects of any "successful" treatment program.

In addition to determining the significance of the behavior changes realized by the subjects in this study, the investigator wanted to demonstrate the effects of the experimental contingencies on these behavior changes. With the use of three experimental designs, cause-effect inferences were made possible. The designs employed in
the analysis of the data for Subjects 1 and 2 were not as strong as the multiple baseline designs used to analyze the data for the other subjects. With Subject 1, an ABA reversal design did not demonstrate a cause-effect relationship between behavior and the experimental contingency. It can be assumed that this subject's behavior did not revert back to baseline rates because "naturally occurring" reinforcers apparently maintained her behavior at the intervention level. This is not uncommon in self-management research where the behavior is maintained by naturally occurring events in the environment which are not directly manipulated by the investigator. Such is the case when noticeable behavior change becomes reinforcing to the subject.

A changing criterion design was used to analyze the data for Subject 2. Although his behavior appeared to match a changing criterion for reinforcement, the changes occurred in a predictable direction, making causality inferences somewhat tentative. In order to clearly demonstrate a cause-effect relationship with this type of design, the criterion for reinforcement should change in an unpredictable, unpatterned fashion. When the criterion is changed in this manner, extraneous events are less likely to be responsible for behavior change. Even though Subject 2 quit smoking during the experimental phase of his study, it is not certain that the experimental contingencies were responsible for this behavior change.

Multiple baseline designs were employed in the data analysis of the remaining thirteen subjects because several individuals chose to modify the same behavior. Cause-effect inferences are less
dramatic with Subjects 3 and 4 than with those of the other subjects employing this kind of design. Although behavior changed with both subjects as the intervention contingencies were applied, the changes noted were not clear-cut changes. Causality was demonstrated, however, with both the weight-control subjects and the study-control subjects.

Although the self-management mini-course was designed as a self-instructional package, the investigator concluded that the course contingencies were not of sufficient strength to maintain each subject's progression through the five individualized modules. In addition, the course manual, while providing explicit objectives and evaluative criteria, did not contain material which was easily comprehended by undergraduates in a self-instructional setting. The investigator found it necessary to meet with the subjects regularly in small groups to explain and discuss the material and to reinforce their self-management efforts. Although 87 percent of the subjects reported that the successful completion of their self-management projects was facilitated by material on elementary behavior analysis, it is doubtful this information would have been helpful with a completely self-instructional format.

As the major intervention of this study, the self-instructional package was not as effective in guiding the self-management efforts of the subjects as it was expected to be. In the opinion of the investigator, the course manual should be revised to accommodate a lower level of comprehension by undergraduates. This might be accomplished by reducing the number of technical terms
used in the course material. It is also unwise, in the opinion of
the investigator, to expect undergraduates to employ a totally self-
instructional system of behavior change until they have had some
successful independent study experiences. Many initial attempts at
personal behavior change fail because of a lack of social reinforce-
ment. A beginning course in self-management should provide for
periodic peer and supervisor feedback. The usefulness of such a
course in an undergraduate teacher education program, however, is
questionable in terms of the amount of time required of the supervisor
or teacher. If it were possible to replace the supervisory model
with a peer-feedback model, the cost-effectiveness of such a course
would be greatly enhanced. Weekly meetings of all subjects together,
rather than small groups meetings, would facilitate the use of peer
feedback and reduce the number of hours required of the supervisor.
At these meetings, each student would have to discuss the course
material, relate it to his own behavior, and display to the others
graphs of his personal data.

In addition to the preceding recommended changes in the mini-
course, the investigator feels that more time and emphasis should be
devoted to Module V. In order to determine the degree to which self-
management training is generalized to other environments, students
should be expected to design for themselves, or for a friend, another
self-management project involving a different kind of problem. For
the most part, the subjects in this study merely designed projects
similar to the ones completed by their peers. Thus, it was difficult
to ascertain their facility in handling the self-management terms and
in designing a program to modify a new problem.

Recommendations for Further Study

Based upon the results of this study and the problems encountered during the study, the investigator proposes the following major recommendations for directions of future self-management research:

1. Extension to other settings and problems and replication with other populations.

2. Use of controlled group studies to determine the effectiveness of the various components of the intervention package.

3. Improvement in the self-management course.

4. Better control of extraneous variables and more concern for methodological problems.

5. Programmed generalization and follow-up.

6. Integration of the research on the internal-external control-of-reinforcement construct (IE) with self-management research.

In order to make definitive statements regarding the parameters of self-management, empirical evidence should be replicable by independent researchers. Thus, before any elaborate theories are advanced, sound empirical evidence must be available. Studies such as this one should be replicated with subjects from different populations. That is, it would behoove us to examine the ability of prospective teachers in other subject matter fields to engage in self-management research. A random sample from the university population at large would provide another source of replicability. If independent researchers obtain similar results with a similar self-management
study, the credibility of the findings of the original study is enhanced.

It would also be of value to replicate the findings of each subject in this study. This is especially true in cases where only one subject comprised the sample. If nail biting, for example, can be modified with the use of specific self-management procedures, it should follow that other subjects should be able to employ these techniques with similar success.

The problems modified in this study were personal and only indirectly related to the role(s) of the teacher. Future research should investigate the abilities of pre-service teachers to modify specific aspects of their own teaching behaviors. If, for example, a student had a fear of public speaking, this would definitely have an impact on his ability to successfully enact the various and complicated roles required of a teacher today. There is research evidence to support the success of self-management efforts in this area. An examination of the problems encountered by teachers in the field suggests that we could avoid some of these by teaching students general problem solving strategies which they could implement themselves.

Controlled group studies are needed in order to test the effectiveness of specific components of the treatment package. Although single-subject designs could be utilized for this purpose, it would require numerous systematic replications in order to make empirical comparisons of any of the techniques. And, when the same individual experiences a series of treatments implemented at different times (repeated measures), you run the risk of contaminating the
results. That is, one treatment may be affected by the order in which it is received. Therefore, if one wished to make generalizations about a particular component of the intervention package used in this investigation, a group study would be more applicable.

If the present investigator were conducting a similar study, she would make some definite changes in the format of the self-management course taken by the subjects in this study. First, more time would be devoted to an understanding of behavior principles. Research suggests that treatment of a specific problem may not be the best way to teach self-management of multiple, complex problems. Rather, it is more feasible to teach general strategies for understanding and controlling behaviors which can be applied to various kinds of problems. In addition, the investigator would provide opportunities for group meetings once a week for students to discuss and share their data with one another. Each subject would transfer his weekly graph of data to an overhead transparency which he would show to the other members of the self-management group. This would give them an opportunity to compare results and to discuss behavior trends illustrated by the graphs.

There are several extraneous variables which usually fall outside the immediate purview of self-management researchers, but which deserve some considerations. One example of the kind of "noise" found in self-management research is the reactivity of self-observation. If self-observation is used as a measurement device, the internal validity of the study is threatened. That is, it is often difficult to determine the effects of a treatment variable when self-observation is utilized. If the primary purpose of the study is
to obtain change, this is less of a problem. If, however, causation inferences are desirable, studies which parcel out the effects of self-observation are needed.

Another source of variability is observer bias. If the subject has any knowledge of the researcher's hypotheses, he may distort his data to conform to these hypotheses. Although the present investigator did not reveal her research hypotheses, she did inform the subjects of the purpose of the experiment. This brings up another important issue in self-management research. When subjects are told what they might expect from participating in a study, a "response set" is likely to be established,

...just about any technique can be partially and/or temporarily effective if it is presented with generous professional assurance and the expectancy of improvement [Thoresen and Mahoney, 1974, p. 28].

Reliability is a variable which poses severe problems for self-management research. It is often difficult or impossible to obtain independent observations of self-monitored data. Because of this, the consistency of the measurement procedures can be questioned. The present investigator recognized the problem of obtaining independent observations of each of her fifteen subjects. Therefore, she set the occasion for reliable data collection by encouraging them to be honest and by giving them no reasons to "fudge" their data. Although systematic recording devices do not guarantee subject reliability, they do provide convenient and precise ways to record behavior. If subjects are taught how to use these devices to monitor their own behavior, the chances for reliable measurement are increased. The investigator provided minimal training in self-observation with her subjects.
Future studies of this nature should involve a period of systematic training in self-observation. To encourage the subjects in this study to keep accurate and current records of their behaviors, data checks were made by the investigator twice per week.

The internal validity of a self-management study must be considered if causation inferences are desirable. The best way to establish cause-effect relationships with single subjects is with the use of an experimental design. Three types of experimental designs have been used successfully in self-management research: (1) multiple baselines; (2) reversals, and (3) changing criterions. Since the primary purpose of the investigator was to obtain change, the use of experimental designs to establish causality was a secondary concern. Future research should include examples of tightly controlled experimentation if we are to advance scientifically in the area of self-management.

Although there is little research to support this claim, it is thought by many that self-management enhances response maintenance and transfer of training. However, behavior modifiers have recently concurred that generalization should be programmed. Kazdin [1975] feels that if individuals are trained to control their own behavior, it is unlikely that behavior gains will be lost once the program is withdrawn. Most self-management research which reports desirable behavior change at the end of a treatment fails to substantiate behavior maintenance with follow-up investigations. Therefore, future self-management studies should plan carefully for the maintenance and transfer of training. One way this could be accomplished is by having subjects who are initiating their self-management efforts select a
target behavior that is likely to be maintained by natural consequences in the environment. Another way to program generalizations is to gradually fade or remove the contingencies [Kazdin, 1975]. A third and final way of insuring response maintenance and transfer of training is to teach individuals general self-management skills which can be applied to a variety of problems in different settings.

The last recommendation of the present investigator involves that of research in the area of Locus of Control (IE). The very essence of self-management training is the shift in the control of behavior from an external agent to the individual himself. The IE research [Rotter, 1966] suggests that the individual who is internally controlled in comparison to the individual who is externally controlled is likely to:

1. be alert to those aspects of his environment that provide useful information for his future behavior;

2. take steps to improve his environmental condition;

3. place greater value on skill or achievement reinforcement and to be generally more concerned with his ability; and

4. be resistive to subtle attempts to influence him [Mahoney and Thoresen, 1974, p. 195].

Future research in behavioral self-management should integrate the "trait" research on IE with the results of controlled self-management studies. The IE work may well provide us with important information regarding the variables which maintain and sustain self-management efforts. We may find that self-management techniques are limited to those who have enough "control" to initiate the procedure. Whether
self-management techniques are unsuited for certain treatment populations remains to be determined [Kazdin, 1975].
APPENDIX A

EXAMPLES OF THE GRAPHS USED BY THE SUBJECTS IN THE STUDY
STUDY TIME - 1 WEEK

RECORD STUDY TIME (RED)
RECORD TIME WASTED (BLUE)

AMOUNT OF TIME

6:00-
5:45-
5:30-
5:15-
5:00-
4:45-
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2:15-
2:00-
1:45-
1:30-
1:15-
1:00-
45 min-
30 min-
15 min-

DAYS

WEEK NUMBER___ TOTAL TIME STUDIED___ TOTAL TIME WASTED___

1  2  3  4  5  6  7
EVENT RECORDING

EVENTS

1. NAIL BITING
2. HANDS IN MOUTH
3. PICKING AT NAILS

DAYS

EVENTS
CALORIC INPUT AND OUTPUT

DAYS

CALORIES

INPUT (RED)
OUTPUT (BLUE)
APPROPRIATE EATING BEHAVIORS

JUNK FOOD (RED)
GOOD FOOD (BLUE)
APPENDIX B

SELF-MANAGEMENT COURSE MANUAL
SELF-MODIFICATION MINI-COURSE
Spring, 1976

NAME:
AGE:
SEX:
## SELF-MODIFICATION MINI-COURSE

### Block I

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<thead>
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<td>2</td>
<td>Behavioral Self-Management</td>
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<td>3</td>
<td>Elementary Principles of Behavior Analysis</td>
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<tr>
<td>4</td>
<td>A Personal Research Project in Self-Management</td>
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<tr>
<td>5</td>
<td>Applying Principles of Self-Management to Other Problem Behaviors</td>
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### Evaluation

If you undertake this mini-course as your elective requirement, you will be expected to complete all of the assignments in each module by a designated time. In order to assist you in proceeding through this course efficiently, a time schedule will be given to you. Basically, the assignments are personal in nature and will differ somewhat for each student, depending upon the personal research project chosen. You will be given a "pass" for this segment of your Block I experiences if your work meets the criterion levels established by the instructor. Because you will be working closely with the instructor, it is expected that your work will be closely monitored, and as a result, will be satisfactory to the instructor.

### MODULE I

**Title:** Introduction to the Course

**Goal:** To explain to you the purpose of the course, the general format of the course, and the goals of the course

**Enabling Activities:** 1) Read "Introduction to the Course"

**Assessment:** Complete the enabling activity
Purpose

Because of the complex and ever-changing nature of our society, modern man finds himself confronted continuously by situational problems with which he must cope. Apart from the level of complexity or the degree of seriousness of such problems, the effectiveness with which one is capable of handling them clearly varies from person to person. Many of us go through our daily routines given the same exposure to ideas, experiences, and people as others, but remain unable to change our view of ourselves or others, and unable to give up self-defeating patterns of behavior, even though solutions and opportunities for growth are at an arm's length. Others meet their world in rigid, fearful, or aggressive ways, finding little happiness or satisfaction, yet unable to break the vicious circles they seem to engender. Each of us experiences situations in which we are stymied in resolving our own personal and interpersonal problems. We go through each day with a list of goals we would like to accomplish. If we succeed in accomplishing them or at least move toward them, we are likely to consider ourselves well-adjusted to daily situations and demands. Of course, rarely do we accomplish every goal we set. We all have limitations, and our environment imposes other limitations upon us. Problems arise when we recognize that we are not achieving our goals because we do not know how to achieve them. When we believe that there is no behavior in our repertoire that will allow us to be effective in securing our goals, we are likely to see no contingency between any effort on our part and the end results in a particular situation. When this occurs, we are not at harmony with our environment or with ourselves.

The objective of this course is to help you achieve personal goals which are important to you. These goals may involve changing particular problem behaviors, including emotional responses, self-perceptions, self-confidence, etc., or they may involve increasing the level of behaviors which are currently in your behavioral repertoire. The ultimate aim is not a sweeping change in your personal life style or way of living, but it does involve altering key aspects of your behavior or your environment which will enable you to be more self-directed. The self-management approach to life assumes that you will become responsible for your own behavior and will be able to produce desirable behavioral changes in yourself when the need arises. Hopefully, this course will prepare you to be your own personal scientist, skilled in calculating and understanding your own behavior and its consequences. Your ability to reason and plan, particularly when faced with problematic behaviors and situations requiring some decision on your part, will play a significant role in the likelihood that you will affect your own fate.

The self-management approach taken in this course is based on a behavioral perspective. Rather than being viewed as a general trait,
the behavioral approach to the study of self-management focuses on the
different procedures that you can employ in gaining greater control
over your behaviors. Behavioral self-management procedures will enable
you to enhance your own sense of personal freedom by increasing your
awareness of deterministic influences and by giving you the tools and
strategies to change your life. Your ability to exercise self-
management will depend upon your ability to recognize the factors which
impinge upon your behavior as well as your ability to exert some influ-
ence over these forces in a desired manner. This course will not focus
on such mystical concepts as "willpower" and "conscience" in estab-
lishing self-management skills. Instead, the focus will be on a set of
procedures that you can use to direct and manage your own internal and
external behaviors. In order to facilitate the learning of self-
management skills, you will need a basic understanding of functional
behavior analysis as it relates to self-management. Thus, a portion of
the course will be devoted to exercises in which behavior-environment
relationships are explored.

Format

Because this course is designed to affect you personally, an
individualized format will be followed with a few exceptions. There
will be times when group meetings will facilitate the goals of the
course, but the majority of the course experiences will involve you and
the instructor. You will be responsible for carrying out a number of
small personal projects related to self-management and for keeping
accurate personal records of these experiences. Hopefully, the data you
collect on yourself will be meaningful in terms of your becoming more
self-directed in dealing with the problems that confront you in your
day-to-day encounters with yourself and with others.

There are five modules which you will complete during the
course. They have been sequenced in the order in which they should be
completed. A time-schedule will be given to you designating meeting
times and dates for completion of the various modules. All of the
course materials which you will need are contained within the manual.

Goals

The following goals have been established to guide the exper-
ences found within each of the modules:

1. To provide you with experiences which will enable
   you to understand and utilize elementary principles
   of behavior analysis.

2. To provide you with the skills needed to solve your
   own personal problems and to direct your life in an
   effective manner.

3. To provide you with opportunities to examine parti-
   cular personal behaviors and to engage in systematic
   personal research within a behavioral self-management
   framework.
MODULE II

Title: Behavioral Self-Management

Goal: To introduce you to the basic ideas and concepts in the behavioral approach to self-management

Enabling Activities: 1) Read the following articles:
   c) Individual Freedom as Personal Power, by M. Mahoney and C. Thoresen.

2) Answer self-assessment questions after each article.

3) Compile a list of five dissatisfactions or problem behaviors you are interested in modifying.

4) Select one of the problematic behaviors from your list and state the problem in terms of "behavior-in-particular-situations."

Assessment: Complete the enabling activities

Self-Assessment Questions: Adjustment: Behavior and the Environment

1. What is the author's concept of "adjustment?"

2. What does it mean to describe adjustment in terms of "behavior-in-specific-situations?"
3. Explain the functional relationship between behavior and the environment.

Self-Assessment Questions: Foundations of Self-Management

1. Where does the impetus to change a behavior usually originate?

2. In general, what kinds of behaviors can you lean to alter with a behavioral self-management approach?

3. Why do many self-management projects fail?
4. How can self-management efforts be maintained and sustained?

5. What do the authors say about "personality" and behavior change?

Self-Assessment Questions: Individual Freedom on Personal Power

1. Describe the authors' notion of the "free individual."

2. Why are the authors excited by the behavioral approach to self-management (self-control)?
The purpose of this course is to provide you with skills in identifying problem behaviors and in modifying them in an effective manner. Using the chart below, list five personal behaviors or dissatisfactions you would like to modify. Thoughts and attitudes may be regarded as behaviors. Think carefully about this task and try to delineate five problems which are affecting the important aspects of your life. One of these problems will become the focus for your personal self-management project.

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<th>Problem Behaviors or Dissatisfactions</th>
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<td>5.</td>
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</tr>
</tbody>
</table>

Generally, behavioral problems and dissatisfactions involve one of two situations:

a) you are currently engaging in behaviors you wish you were not engaging in, or

b) you are not engaging in behaviors you wish you were engaging in.
One of the best ways to alter behavior is to strengthen or weaken behaviors incompatible with the problem behavior. That is, behaviors can be stated both in terms of:

a) behaviors you wish to increase or decrease, and

b) incompatible behaviors you wish to increase or decrease

Let's take a specific instance. For example, you might wish to eliminate or decrease your self-critical behaviors, but it is unlikely that this effort will result in a more "positive" attitude toward yourself unless behaviors incompatible with self-critical behaviors are simultaneously increased. Thus, while your self-modification might involve decreasing self-critical behaviors, you might wish to also try to strengthen positive behaviors. Another example involves increasing the amount of physical activity in which you engage. Besides increasing the amount of activity, you might also wish to decrease the behavior incompatible with activity, such as sitting around wasting time or watching T.V. For each behavior you cited earlier, state the problem in terms of behavior you wish to increase or decrease. In addition, state incompatible behaviors which you might increase or decrease at the same time. (See following page)

From your readings, it should be apparent to you that problem behaviors are generally specific to a particular situation. That is, your behavior is tied to the environment in such a way that you behave differently in different situations. Can you state your problems in terms of your behavior in particular situations? From the list of personal problems or dissatisfactions, choose one of the problems and write a one-paragraph analysis in which your problem behavior is linked to the situation(s) in which it occurs (or does not occur). Be as specific as you can. You might wish to cite examples of the problem from your real life and then try to discover what they have in common. Giving yourself examples will also serve to specify the circumstances under which the problem behavior occurs. It may be that it occurs in several situations. The point of giving yourself examples is not necessarily to specify only one situation; the point is to describe fully those situations in which it does occur. If the behavior occurs in several situations, it may be that these situations have some element in common. When such a generalization can be made accurately, you have one "behavior-in-a-situation" unit. If no such general class can be identified, you merely have several "behavior-in-a-situation" units constituting separate problems. In such cases, you would want to treat each of these several units separately, perhaps one at a time. Sometimes it may be helpful to phrase the problem in hyphenated units. For example, a problem might be stated as "aggressiveness-when-people-ask-me-for-a-favor." This description helps to label the behavior-in-a-situation as a single unit. (Space for writing available on page 213)
<table>
<thead>
<tr>
<th></th>
<th>Behaviors</th>
<th>Increase</th>
<th>Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Behavior:</td>
<td></td>
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<tr>
<td></td>
<td>Incompatible Behavior:</td>
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<tr>
<td>2.</td>
<td>Behavior:</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Incompatible Behavior:</td>
<td></td>
<td></td>
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<tr>
<td>3.</td>
<td>Behavior:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incompatible Behavior:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Behavior:</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Incompatible Behavior:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Behavior:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incompatible Behavior:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
One-Paragraph Analysis of Problem
Title: Elementary Principles of Behavior Analysis

Goal: To acquaint you with the basic principles of behavior analysis and terminology which will facilitate your self-management efforts

Enabling Activities: 1) Read Behavior-Environment Relationships, BY D. Watson and R. Tharp

2) Answer the self-assessment questions on the reading

3) Write an analysis of your problem using as many principles of behavior as you can

4) Observe your problem behavior for a period of one week and note antecedents and consequences surrounding your behavior

5) Analyze available reinforcers and make a list of possible reinforcers you can use

Assessment: Complete the enabling activities

Self-Assessment Questions: Behavior-Environment Relationships

1. What is a positive reinforcer?

2. What is a negative reinforcer?
3. What is extinction?

4. What effect does punishment have on the frequency of behavior?

5. What is avoidance behavior?

6. How does avoidance behavior come under antecedent stimulus control?

7. Why is avoidance behavior so resistant to extinction?
8. How does most operant behavior eventually come under antecedent stimulus control?

9. What is the role played by the "cue?"

If you were able to answer all of the questions pertaining to the reading, you probably have a good grasp of the principles that explain your behavior. The following task will help you develop some skill in applying these principles to your own situation.

Take the problem which you delineated and described in terms of a "problem-in-a-particular-situation" and write an analysis of the problem using as many principles of behavior as you can. The purpose of this assignment is to develop your facility in handling the concepts.

Behavioral Analysis
If you want to influence a change in your behavior, you may first have to observe what is sustaining that behavior at its present rate. One clue may be what happens immediately before the problem behavior occurs. If you can observe and then say, "When X happens, I do Y," then you are well on your way to understanding what stimulates that particular behavior. These stimuli are referred to as antecedents because they precede other behaviors.

However, it is quite likely that what influences your behavior most is what happens immediately after it occurs. Most behavior is learned through interaction with the social environment. If an action (whether "good" or "bad") brings a response which the behaver interprets as pleasant, it is likely the action will be repeated. Since that phenomenon strengthens the behavior, it is called a reinforcer. Reinforcers are consequences of other behaviors.

Behaviors generally occur in chains--that is, they are embedded in a sequence:

antecedents—behaviors—consequences
(target)

Observe carefully your target behavior for a period of one week. Note in the chart provided specific antecedents (cues) which seem to precede your target behavior and note those consequences which seem to follow it. This will give you a more comprehensive picture of the situational variables which are affecting your behavior.

<table>
<thead>
<tr>
<th>Target Behavior:</th>
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</thead>
<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Antecedents</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
</tr>
</tbody>
</table>
When a behavior is initially attempted, it will likely be repeated only if it is reinforced consistently. Once a behavior is established, however, it takes only intermittent reinforcement to maintain it. We all know from personal experiences that our social environments do not always reinforce us in a desired manner. We are not praised every time we do something. Initial attempts at changing a personal behavior will require that your target behaviors or goals be reinforced when they occur. Reinforcement is largely personal in nature, although there are some rather "universal" reinforcers such as love, praise, smiles, etc. Before you undertake your personal self-management project, you should identify a pool of available reinforcers from which you can select particular ones to use in your project. Your list should include things you can do for yourself, as well as things others might do for you. Some examples of possible reinforcers are suggested below. Following this list, construct your own list of things, events, objects, experiences, etc., which are important and accessible to you.

**Examples**

| Going to a movie                        | Having a sundae   |
| Visiting a friend                      | Watching T.V.    |
| Eating                                 | Dating           |
| Buying yourself a personal gift        | Going to a sporting event |
| Participating in a sport or leisure activity | Telling yourself "good job" |
|                                        | Taking a study break |

**Your List**
MODULE IV

Title: A Personal Research Project in Self-Management

Goal: To provide you with additional self-management skills in modifying a problem behavior; to provide you with guidance in applying the skills to a personal self-management project

Enabling Activities: 1) State your behavioral goal in precise language (new target behavior)

2) Define carefully the behavior(s) you will be observing and recording

3) Collect, record, and analyze baseline data for a period of two weeks

4) With the instructor, determine an effective intervention strategy

5) Implement the intervention while still collecting data on your behavior

6) Analyze your data

7) Determine the success of your self-management program

Assessment: Complete the enabling activities

The purpose of specifying the problem carefully in terms of behaviors-in-particular-situations is to know exactly what behaviors to change in which situations. Once the problem has been clearly specified, it is necessary to select a behavioral goal. Some examples of behavioral goals are provided below:

1. I want to eliminate smoking from my behavioral repertoire.

2. I want to lose 30 pounds in three months.

3. I want to eliminate swearing from my vocabulary.

4. I want to increase the amount of positive things that I say to others.

5. I want to participate in an exercise program four time per week.
In order to facilitate your self-management project, state your behavior goal in precise language:

**Behavioral Goal:**

Once the behavioral goal has been specified, it is possible to determine what behaviors should be increased and/or decreased. After delineating your goal, list behaviors which should be increased and those which should be decreased. If, for example, your goal is to lose 30 pounds, you may wish to reduce your caloric intake (eating) and increase your caloric output (exercise). However, before you actually plan and implement an intervention programs to accomplish these goals, you should know your average daily caloric intake and output. A rule of thumb: always keep a record of the behavior that you will have to produce in order to attain some goal. The data gathered before intervention begins are called baseline data. The baseline becomes the standard of comparison for later effects. You have already observed your problem behavior in particular situations. In fact, you observed long enough to determine the salient antecedents and consequences of your problem behavior. How are baseline data different? Basically, these data are quantitative: they result from "counting" something. As you move into your baseline phase, then, you begin to count things and your records are carefully kept in numbers. List below the behavior(s) which are to be monitored and recorded during your baseline period.

**Behaviors to be observed:**

1.

2.
At this stage, it is necessary to invent the best record-keeping system possible. How you record your behaviors will depend, in part, upon the kind of behaviors you are recording. Sometimes you will make a frequency count of discrete behaviors or events (number of self-critical thoughts per day, number of cigarettes smoked per day) and sometimes you will record the amount of time spent in a particular behavior (amount of study time, amount of jogging time). The kind of behavior records that you should use in self-management will be determined by the nature of your problem and your goal.

Once you have decided what should be observed and recorded, the next task is to determine the mechanism for making accurate observations of your behavior. In general, when behaviors are recorded as they occur, behavior records tend to be more accurate than when they are reconstructed at a later time. Thus, your self-recording device should be portable and with you constantly. Some examples of recording devices which are used for recording behaviors are:

1. Paper and pencil
2. Wrist counters
3. Bead counters
4. Stop watches
5. Behavioral diaries

With the instructor, determine the most feasible mechanism for observing and recording your personal data. Describe below how you will carry out this portion of the project.

Recording Device(s):

During the period of time when you are collecting baseline data, it is best to transfer the daily data to a more permanent chart or graph. Not only do charting and graphing provide you with an accurate assessment of the rate of your behavior, they also serve as reinforcing events because you are able to see improvement when it occurs. Sometimes you will find that the mere acts of observing, recording and
graphing your behavior will result in a change because these events serve a cueing function by "reminding" you of the behavior or by "calling your attention" to the behavior. There are various kinds of permanent recording charts and graphs which are available to you. The instructor will provide you with this material once you have determined the kind of behavior(s) you will be recording.

After collecting baseline data for a period of two weeks, you should have a fairly accurate assessment of the normal rate of your target behavior. The next step is to determine how you will intervene in order to increase or decrease that rate. This part of the self-management project is highly specific to the problem you have isolated. There are various strategies and procedures which can be used to affect your behavior. In general, the two major classes of self-control strategies are:

1. changing setting events for your behavior, and
2. establishing effective consequences

As you have already discovered from previous readings, most of your behavior is triggered by antecedent stimuli within particular situations. These stimuli are generally referred to as setting events. Setting events are all those antecedents which precede your behavior or set the occasion for the performance of the behavior. Various stimuli are included as setting events and must be brought under control if you expect to modify your behavior. This procedure is referred to as stimulus control because you are controlling antecedent stimuli. It may involve controlling the time, place, and conditions under which your behavior occurs. In general, this procedure involves re-arranging the situation in specific ways. In some cases, you will eliminate particular stimuli which are contributing to your problem; in other cases, you will add stimuli that will increase the probability that the desired behaviors or responses will occur.

Because most of your behaviors are controlled also by their consequences, many self-management programs will fail if little or no attention is given to what happens after the problem behavior occurs. You will have to arrange effective reinforcers for desirable behaviors and perhaps even use punishment when undesirable behaviors occur. It is important that you set behavioral goals for the awarding of reinforcers and that the administration of reinforcers is always contingent (dependent) upon your execution of the desirable behaviors. You must also arrange to have the reinforcers administered as soon after the desirable behavior occurs as possible.

In order to help you determine what kind of self-control procedures you should employ, the instructor will assist you in this task. Each of you will have problems which may require slightly different approaches. Once this strategy has been determined, describe precisely what you will do on the following page.
You are now ready to implement your intervention to see if it is effective in changing your behavior in a desired manner. You will continue to observe, collect, and record daily data in order to compare this data with your baseline data. This comparison will provide you with evidence of the success or failure of your intervention program. The intervention period will vary for each student because it is dependent upon the research design used. The instructor will explain this to you more fully when she meets with you to plan your intervention.

After your intervention period, you will analyze your data with the instructor and draw some conclusions relative to the effectiveness of your self-management program. This analysis will allow you to specify the successful aspects of your program as well as isolate possible weaknesses in your overall design. This will help you avoid similar mistakes in the future. In the space provided below, you should briefly list the successful components of your strategy and the weaknesses of it.

Successful Aspects:

Weaknesses:
Title: Applying Principles of Self-Management to Other Problem Behaviors

Goal: To determine the effectiveness of the preceding modules in providing you with the skills necessary to plan additional self-management programs

Enabling Activities: 1) Select one of the other problems you cited earlier and design a self-management program to include the following:

a) a statement of the problem behavior in terms of specific situations in which it occurs

b) an analysis of the problem in terms of principles of behavior

c) a statement of behavioral goal; new target behavior

d) delineation of behavior(s) to be observed during baseline

e) type of recording device you would use in self-observation

f) procedure for displaying self-observation data

g) kind of intervention you would employ

h) reinforcers you would administer and the conditions under which you would administer them

Assessment: Complete the enabling activities

Hopefully, you have found the experiences of this course valuable in providing you with some self-management skills. In order to determine the extent to which you can generalize your new skills to other problems, you are being asked to design a self-management program for another problem behavior. You will not have time to implement the program during this course, but those exercises should give you a head-start in carrying out your next personal self-management project. If this course has been successful, you will utilize the skills you have developed in modifying additional problem behaviors.
1. State the problem in terms of specific situations in which it occurs.

2. Analyze the problem in terms of the principles of behavior with which you are familiar.

3. State your behavioral goal. What is your new target behavior?

4. Delineate the behavior(s) you will observe during your baseline phase.

5. Describe the way in which you will record your self-observations.
6. Describe how you will display your self-observation data.

7. Describe the kind of intervention strategy you would use.

8. List the reinforcers you would use and the conditions under which you would administer them.

If you were able to complete the above tasks successfully, you are ready to embark on a new self-management project. Remember, above all else,

KNOW THE CONTROLLING VARIABLES AND EXERT INFLUENCE OVER THEM

or

POWER TO THE PERSON
Evaluative Questionnaire

Name_____________________________________________

Problem Behavior________________________________________

Please answer the following questions as accurately as possible. Be specific in your response because this will facilitate a thorough evaluation of this study.

1. Do you feel that your self-management project was successful, moderately successful, or unsuccessful in terms of the terminal goals you set for yourself? Why?

2. If you were beginning again with this same project, what things would you do differently?

3. Was graphing your behaviors helpful to you in any way(s)? Why or how?

4. Do you think systematic self-observation had any effect on the results you obtained? How?

5. How important was self-reinforcement to the success of your project?

6. What was the most reinforcing aspect of your study?
7. Was the success of your project dependent upon the instructor? Why or how?

8. Did you find that an understanding of basic principles of behavior modification helped you in your project? How?

9. Do you think of yourself now more as your own change-agent than you did prior to the course?

10. Will you apply the self-management skills you learned in this course to modify other personal problems that you encounter in the future?

11. Do you think this self-management course is valuable enough to continue to provide it to other prospective teachers? Why?

12. What improvements would you recommend for any aspect of this course?
APPENDIX D

RECORD OF POINTS EARNED IN TOKEN ECONOMY FOR WEIGHT CONTROL
Record of Points Earned in Token Economy for Weight Control

Week of: ____________________________________________

Subject: ____________________________________________

<table>
<thead>
<tr>
<th>Date</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
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<td>3.</td>
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<td>4.</td>
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<td>6.</td>
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<td>7.</td>
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</tbody>
</table>

TOTAL POINTS EARNED ________

Reinforcement contingent upon earning ________ points.

Reinforcement: ________
APPENDIX E

DAILY FOOD CHART
## DAILY FOOD CHART

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Food Eaten</th>
<th>Time</th>
<th>Place</th>
<th>Calories</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
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<tr>
<td>Lunch</td>
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<tr>
<td>Dinner</td>
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<tr>
<td>Snacks</td>
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</tbody>
</table>

**TOTAL DAILY CALORIES**
APPENDIX F

TIME SCHEDULE
<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
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<tbody>
<tr>
<td>7:00 A</td>
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<td>3:00 P</td>
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<td>10:00 P</td>
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<td>12:00 midnight</td>
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</tr>
</tbody>
</table>
List of Daily Objectives

Date:__________________________________________

Subject:_________________________________________

____ 1.

____ 2.

____ 3.

____ 4.

____ 5.

____ 6.

Check off the goals you accomplished. If you did not accomplish all of them, why not???
APPENDIX H

DAILY RECORD OF TASKS COMPLETED
FOR STUDY GROUP
Daily Record of Tasks Completed
For Study Group

Date:

Subject:

<table>
<thead>
<tr>
<th>Task</th>
<th>Point Value</th>
<th>Points Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wrote a list of objectives for today.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2. Accomplished all of my objectives.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3. Studied my designated amount of time.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. Completed an assignment early.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5. Recorded my study time on the graph.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6. Attended all of my classes today.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7. Worked in the library at least 30 minutes.</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL POINTS EARNED

Reinforcement contingent upon earning ________ points.

Reinforcement:________
LIST OF REFERENCES


Fuller, F. A conceptual framework for a personalized teacher education program. Theory Into Practice, 1974, 13(2), 112-122.


Homme, L. E. Perspectives in psychology: XXIV. Control of overants, the operants of the mind. *Psychological Record, 1965, 15, 501-511.*


________. Enhancing creativity by modifying what Ss say to themselves. Unpublished manuscript, University of Waterloo, 1972.


