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Psychology, clinical

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BEHAVIORAL SELF-CONTROL:

TRAINING STUDENTS IN THE SELF-IMPROVEMENT OF STUDYING

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN PSYCHOLOGY

DECEMBER 1975

By

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ACKNOWLEDGMENTS

The present study has been made possible by the contributions of many persons. The Rev. David Coon, Headmaster of Iolani School, recognized the role of research in education in granting me complete access to school facilities and materials. Michael Higashi, Director of Counseling, helped me to overcome day-to-day hindrances in the implementation of the study. Other members of the Iolani Family--Suzanna Rapson, Linda Ching, Mae Kurashige, Millie Taam, and Sharon Takara--devoted substantial time and effort to logistical matters on my behalf.

I owe a debt of gratitude to Marilyn Moto, Pearl Choi and Rosemary Fo for exhibiting dedication beyond the call of duty in meeting the heavy typing requirements of the study; Yvette Au and Sheri Sloggett for persevering at the enormous task of tabulating the data; Jerry Brennan, Karl Minke, and Reginald Wood for helping in the analysis of the data; my colleagues at the Behavior Therapy Clinic--Ed Kubany, Barbara Sloggett, and Peter Guay--for offering much material and moral support; and Bill Higa and Dave Lam for their thoughtful ideas.

I am especially grateful to Sandi Fo for her untiring help in virtually every phase of the investigation; she proved herself indispensable to the present research endeavor and to my life.

Finally, I am most indebted to the 140 students at Iolani School who, as program participants, showed much diligence in carrying out the requirements of the study-improvement program. Their dilapidated study diaries serve as a testament of their intense involvement in the study.
A behavioral intervention model is described for training 140 intermediate and high school students in the self-modification of their study and academic behavior. The relative therapeutic contributions of stimulus control and contingency contracting were compared within the context of either self- or group-administered treatment, using a mixed design with repeated measures.

The results showed an overall dropout rate of 28 percent, with no differential attrition among treatment conditions. Planned orthogonal comparisons indicated significant differences in therapeutic outcome between treatments and controls on the principal criterion measures of study rate and grade point. That is, an active form of intervention—whether specific or nonspecific—was reliably more effective than self-monitoring control in enhancing study output, and significantly more successful than no-treatment control in improving grades. Nonspecific placebo treatment, however, proved reliably more effective than specific treatment in producing increments in study rate, though not in corresponding grades. A comparison of the efficacy of stimulus control and contingency contracting revealed no differential treatment outcome in either studying or grades. No reliable differences were found between the intervention effects of self- and group-administered treatment modalities, although the superiority of group treatment in yielding greater study rates than self-treatment approached statistical significance.

The implications of these findings were discussed in relation to the possible potent role of placebo and social influence in instructing students in behavioral self-control methods of study improvement.
**TABLE OF CONTENTS**

| ACKNOWLEDGMENTS                                      | iii |
| ABSTRACT                                             | iv  |
| LIST OF TABLES                                       | viii|
| LIST OF FIGURES                                      | ix  |
| PREFACE                                              | x   |

<table>
<thead>
<tr>
<th>CHAPTER I</th>
<th>BEHAVIORAL SELF-CONTROL: AN INTRODUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sources of Control in Human Behavior</td>
<td>1</td>
</tr>
<tr>
<td>A Behavioral Approach to Self-Control</td>
<td>3</td>
</tr>
<tr>
<td>Theoretical Bases for a Behavioral Analysis of Self-Control</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER II</th>
<th>STUDY IMPROVEMENT AS A TARGET OF INTERVENTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of Studying in Education</td>
<td>24</td>
</tr>
<tr>
<td>Improvement of Study Habits and Skills</td>
<td>27</td>
</tr>
<tr>
<td>A Behavioral Analysis of Studying</td>
<td>34</td>
</tr>
<tr>
<td>A Behavioral Intervention Model for Study Improvement</td>
<td>39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER III</th>
<th>THE EXPERIMENTAL PROBLEM: SELF-CONTROL OF STUDYING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studying as a Target of Self-Control</td>
<td>46</td>
</tr>
<tr>
<td>Behavioral Self-Control of Studying: A Review</td>
<td>47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER IV</th>
<th>BEHAVIORAL TREATMENT OF ACADEMIC UNDERACHIEVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Underachievement as a Focus of Behavioral Intervention</td>
<td>75</td>
</tr>
<tr>
<td>Behavioral Treatment of Academic Underachievement: A Review</td>
<td>78</td>
</tr>
<tr>
<td>Summary and Conclusions</td>
<td>88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHAPTER V</th>
<th>SELF-ADMINISTERED TREATMENT BY BIBLIOTHERAPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Bibliotherapy as a Treatment Modality</td>
<td>92</td>
</tr>
<tr>
<td>Self-Administered Treatment by Bibliotherapy</td>
<td>94</td>
</tr>
<tr>
<td>Summary and Conclusions</td>
<td>99</td>
</tr>
</tbody>
</table>
# CHAPTER VI
THE EXPERIMENT: AIMS AND HYPOTHESES

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Research Questions</td>
<td>102</td>
</tr>
<tr>
<td>Specific Research Aims</td>
<td>104</td>
</tr>
<tr>
<td>Experimental Hypotheses: An Overview</td>
<td>105</td>
</tr>
</tbody>
</table>

# CHAPTER VII
METHOD

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>109</td>
</tr>
<tr>
<td>Subjects</td>
<td>110</td>
</tr>
<tr>
<td>Procedure</td>
<td>114</td>
</tr>
<tr>
<td>Experimental Design</td>
<td>129</td>
</tr>
</tbody>
</table>

# CHAPTER VIII
RESULTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedures for Analysis of the Data</td>
<td>142</td>
</tr>
<tr>
<td>Measures of Data Bias</td>
<td>148</td>
</tr>
<tr>
<td>Principal Findings</td>
<td>155</td>
</tr>
<tr>
<td>Supplementary Findings</td>
<td>172</td>
</tr>
<tr>
<td>Summary of Results</td>
<td>181</td>
</tr>
</tbody>
</table>

# CHAPTER IX
DISCUSSION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dropouts</td>
<td>184</td>
</tr>
<tr>
<td>Interpretation of Principal Findings</td>
<td>185</td>
</tr>
<tr>
<td>Interpretation of Supplementary Findings</td>
<td>195</td>
</tr>
<tr>
<td>Sources of Experimental Bias</td>
<td>197</td>
</tr>
</tbody>
</table>

# CHAPTER X
IMPLICATIONS AND CONCLUSIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Problems in the Present Approach</td>
<td>207</td>
</tr>
<tr>
<td>Implications of the Results</td>
<td>217</td>
</tr>
<tr>
<td>Practical and Theoretical Considerations</td>
<td>223</td>
</tr>
<tr>
<td>Conclusions of the Study</td>
<td>229</td>
</tr>
</tbody>
</table>

# APPENDIXES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Experimenter's Letter of Invitation</td>
<td>232</td>
</tr>
<tr>
<td>B</td>
<td>Headmaster's Letter of Invitation</td>
<td>233</td>
</tr>
<tr>
<td>C</td>
<td>Program Description</td>
<td>234</td>
</tr>
<tr>
<td>D</td>
<td>Commitment Contract Form</td>
<td>238</td>
</tr>
<tr>
<td>E</td>
<td>Parental Approval Form</td>
<td>239</td>
</tr>
<tr>
<td>F</td>
<td>Sample Page of Study Diary</td>
<td>241</td>
</tr>
<tr>
<td>G</td>
<td>Pretreatment Questionnaire</td>
<td>242</td>
</tr>
<tr>
<td>H</td>
<td>Posttreatment Questionnaire</td>
<td>244</td>
</tr>
<tr>
<td>I</td>
<td>Semantic Differential</td>
<td>246</td>
</tr>
<tr>
<td>J</td>
<td>Self-Instructional Study Manual</td>
<td>248</td>
</tr>
</tbody>
</table>

# REFERENCES

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>310</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classification of Subjects by Grade-Levels</td>
</tr>
<tr>
<td>2</td>
<td>Means and Standard Deviations of Paper-and-Pencil Measures</td>
</tr>
<tr>
<td>3</td>
<td>Coefficients of Planned Orthogonal Comparisons on Study Rate</td>
</tr>
<tr>
<td>4</td>
<td>Coefficients of Planned Orthogonal Comparisons on Grade Point</td>
</tr>
<tr>
<td>5</td>
<td>Dropout Rate by Treatment Conditions</td>
</tr>
<tr>
<td>6</td>
<td>Dropout Rate by Treatment Conditions and Time Periods</td>
</tr>
<tr>
<td>7</td>
<td>Degree of Implementation of Treatment Procedures</td>
</tr>
<tr>
<td>8a</td>
<td>Means and Standard Deviations of Study Rate of Treatment Conditions across Time Periods</td>
</tr>
<tr>
<td>8b</td>
<td>Adjusted Means of Study Rate of Treatment Conditions across Time Periods</td>
</tr>
<tr>
<td>9</td>
<td>Number and Percent of Ss by Treatment Conditions Showing Improvement in Study Rate across Time Periods</td>
</tr>
<tr>
<td>10</td>
<td>T-Tests Between Improved and Unimproved Groups on Subject Variables</td>
</tr>
<tr>
<td>11a</td>
<td>Means and Standard Deviations of G.P.A. of Experimental Conditions across Time Periods</td>
</tr>
<tr>
<td>11b</td>
<td>Adjusted Means of G.P.A. of Experimental Conditions across Time Periods</td>
</tr>
<tr>
<td>12a</td>
<td>Two-Way Analysis of Variance: Effect of Treatment and Trial on SSHA--Study Habits Scale</td>
</tr>
<tr>
<td>12b</td>
<td>Two-Way Analysis of Variance: Effect of Treatment and Trial on SSHA--Study Attitudes Scale</td>
</tr>
<tr>
<td>13</td>
<td>Two-Way Analysis of Variance: Effect of Treatment and Trial on I-E Scale</td>
</tr>
<tr>
<td>Table</td>
<td>Title</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>14</td>
<td>Two-Way Analysis of Variance: Effect of Treatment and Trial on TAS</td>
</tr>
<tr>
<td>15a</td>
<td>Two-Way Analysis of Variance: Effect of Treatment and Trial on SD--Evaluative Scale</td>
</tr>
<tr>
<td>15b</td>
<td>Two-Way Analysis of Variance: Effect of Treatment and Trial on SD--Cognitive Scale</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Adjusted Mean Study Rate of Treatment Conditions across Time Periods</td>
</tr>
<tr>
<td>2</td>
<td>Adjusted Grade-Point Average of Experimental Conditions across Time Periods</td>
</tr>
</tbody>
</table>
The present endeavor focuses on the development and evaluation of a behavioral self-control model for study improvement. Since a number of relevant topics impinge upon the current investigation, separate chapters are devoted to a discussion of each.

The first chapter introduces the topic of self-control from a behavioral frame of reference and presents the theoretical bases for a behavioral analysis of self-control. The second chapter offers an introduction and rationale for the focus on study behavior as a target of intervention within the framework of behavioral self-control. The third chapter reviews the literature in the behavioral self-control of studying.

Chapters IV and V survey two relevant supporting lines of research, behavioral treatment of academic underachievement and self-administered treatment by bibliotherapy, respectively.

Chapter VI provides an overview of the aims and hypotheses of the present experiment, followed by method in Chapter VII, results in Chapter VIII, discussion in Chapter IX, and implications and conclusions in Chapter X.
CHAPTER I

BEHAVIORAL SELF-CONTROL: AN INTRODUCTION

This chapter introduces the topic of self-control from a behavioral frame of reference and presents the theoretical bases for a behavioral analysis of self-control.

Sources of Control in Human Behavior

Historically, theological and philosophical arguments have ensued over whether it is the self or the environment that controls human behavior. On the one hand, psychodynamically-oriented theorists such as Freud (1924) have advocated an intrapsychic view of human behavior based upon conceptions of internal causation. According to this viewpoint, the underlying determinants of an individual's actions may be found largely within himself, arising from the inferred actions of such intrapsychic-personality entities as willpower, self-determination, and free will. On the other hand, behaviorally-oriented theorists from Watson (1919) to Skinner (1953, 1971) have proposed an environmentalist view of human behavior centered on considerations of external causation. According to this point of view, the individual's moment-to-moment behavior is a function of the continuously acting influence of setting characteristics, learning history, and transient organismic states rather than the inferred actions of agents of internal causation.

Recently, experimental research on the origins and mechanisms of human behavior has provided strong empirical support for the
theoretical position that the determinants of self-control lie in the biological and social environment of the organism (Bandura & Walters, 1963; Gewirtz, 1971, Kanfer & Phillips, 1970; Skinner, 1953). However, there is one important qualification: the individual is not just determined and shaped by the environment, but also simultaneously becomes an active determiner and shaper of the environment. In this sense the relationship between the individual and the environment may be described as a continuous reciprocal influence process (Bandura, 1969; Skinner, 1971). This viewpoint has been articulated succinctly by Jeffrey (1974) as follows:

A human being is controlled by the environment, and he also controls part of the environment that affects him and others. Thus, the old polemics of whether "willpower" or the environment totally controls a person's behavior are antiquated. Traditional conceptions of "willpower" are inadequate, since they do not take into account the continuous influence of the environment on the individual. On the other hand, "traditional" behavior modification notions about the totally controlling environment are inadequate, since they do not take into account the continuous influence of the individual on the environment. In essence, there is an inseparable interdependence between the environment and the self--between being controlled and controlling--and this interdependence should be taken into account in our research and clinical applications. (p. 174)

What is called for, then, is a conceptual model of self-control that (a) clearly extricates the concept of self-control from the realm of philosophical debate on the image of man, (b) viably accounts for the interdependence of internal and external controlling variables, and (c) most importantly, leads directly to the development of empirically-testable process models. The more traditional conceptions of self-control fail to meet each of these important requirements.
A Behavioral Approach to Self-Control

A conceptual model of self-control which does meet all of the critical requirements enumerated above is one derived from a behavioral analysis of self-control phenomena. Recently, substantial attention has been focused on a behavioral perspective of self-control. Theoretical and research interest in behavioral self-control appears to have developed in part out of a growing despair (Mischel, 1968, 1971) with the utility of internal (i.e., state and trait) conceptualizations of willpower, which view self-control as a constant personality entity. The usefulness of a behavioral model of self-control has been demonstrated by a burgeoning number of investigations (e.g., Goldfried & Merbaum, 1973; Kanfer & Phillips, 1970; Mahoney & Thoresen, 1974; Thoresen & Mahoney, 1974). The utility of a behavioral analysis of self-control processes stands in striking contrast to the notorious inadequacy of previous formulations of self-control as voluntary, characterologically fixed behavior. In short, the present perspective suggests that the term self-control, as conventionally used in the popular literature to connote a dualistic image of man, does not offer a useful conceptualization of the phenomena it purports to describe.

A more fruitful approach to the conceptual analysis of self-control phenomena is one in which human behavior is viewed as controlled by a combination of current external influences and self-generated internal stimuli, either of which may be dominant at any given point in time and both of which may affect one another in a continuous reciprocal manner. Such an analysis calls into question an internal conceptualization of self-control and in its place suggests an alternative approach.
involving the assessment of controlling variables of what is presumed to be a multiply-determined phenomenon. According to this latter view, self-control phenomena may be analyzed as a function of the integrated influences of current environmental variables and self-generated variables extant in the individual's repertoire through previous learning. In other words, some of the acting influences on a person's behavior may be sorted out into (a) those that originate in current events of the immediate environment and (b) those that stem from previously learned means of behavior control. Such a perspective constitutes a behavioral approach to the study of self-control.

In contrast to popular notions of self-control which tend to view self-control as a general human trait, a behavioral approach assumes that self-control, like any other human behavior, is governed by the principles of learning. The following major assumptions, as delineated by Goldfried and Merbaum (1973), underlie a behavioral approach to self-control:

(a) The individual himself determines the goals of his attempts at self-control, though he may be influenced by external sources of control in choosing a particular goal.

(b) In applying strategies of self-control for regulating his problematic behaviors, the individual is able to verbalize his goal, and specify the sequence of steps to be undertaken in modifying his behavior.

(c) Strategies for attaining self-control include those for personal self-regulation of behavior as well as those for enlisting environmental support to enhance self-control efforts.
(d) As a functionally defined concept, self-control is demonstrated to have been attained not so much by the procedures employed as by the consequences of the actions taken.

(e) Rather than being regarded as a global personality trait, self-control is viewed as a specific response, or a class of responses, leading to the modification of maladaptive behaviors.

(f) Self-control is acquired through personal experience in the form of systematic or trial-and-error learning, rather than emerging from any innate potential within the individual.

Both conceptual and methodological issues in a behavioral approach to self-control remain to be resolved. A major theoretical problem is that the study of the self-control process involves the conceptualization of a phenomenon in which the individual is cast in the simultaneous role of both subject and object of his own behavior. That is, at the same time that the person is purveyor of the independent variables which affect his behavior, he also responds to these variables as he carries out the behavior under their control (Kanfer, 1970a). Thus a formidable, conceptual dilemma is encountered in explaining a phenomenon in which the individual is simultaneously both subject and object, both the actor and the target of the action. A behavioral conception of self-control has sought to circumvent this dilemma by handling it as a special case of the situation in which one individual acts upon another. Skinner (1953) articulated this approach in the following way:
When a man controls himself, chooses a course of action, thinks out the 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. (p. 228)

A fundamental methodological difficulty with a behavioristic formulation of self-control is that the critical antecedent events and even the behavioral components in a self-controlling response sequence frequently lie entirely within the domain of private experience. Notwithstanding the obvious problems in dealing with such private behaviors, a primary assumption of a behavioral approach to self-control is that self-regulatory phenomena are amenable to investigation by the same methods used to study other classes of behavior.

These conceptual and methodological difficulties have represented major hurdles to behavioral research in self-control. Nevertheless, the available evidence supports the amenability of self-control processes to a behavioral analysis. The inclusion of self-control within an empirically based behavioral theory serves to integrate experimental and clinical findings in self-regulation into a theoretically sound framework, and yields empirically testable process models of self-regulation. In particular, such a framework offers fertile ground for the development of theoretical formulations and experimental hypotheses. In short, a behavioral model of self-regulatory processes provides the kind of interplay between theory, research, and clinical practice in self-control that is an essential requirement if continued advancement of the field is to be facilitated and if clinical practice is to be based on a science of psychology.
Theoretical Bases for a Behavioral Analysis of Self-Control

If research in self-control is to progress as a scientific endeavor, it is imperative that its operational definitions and theoretical foundations are clarified. Agreement in the usage of clear operational definitions in self-control investigations greatly facilitates the advancement of research. Sound theory construction also plays an integral role in basic and applied research in self-control, since theory serves to abstract and integrate the commonalities underlying the facts.

Myriad attempts have been made to explicate the process by which the individual comes to control his own behavior. Within a behavioral framework, in particular, there have been a number of attempts at initial theory construction aimed at accounting for self-control phenomena. Some of these theoretical foundations for behavioral self-control are presented in the pages to follow. While these models of self-regulation are tentative, they have immense heuristic value in that they summarize empirical findings in self-control and generate theoretical and clinical generalizations that can be investigated. It is interesting to note that the practical management of self-control has been far easier in fact to achieve than its conceptual formulation.

Self-Control: Definitions and Perspectives

The Self Construct

The self is viewed by many psychological schools of thought as a unitary personality entity, consisting of an internalized directing
system responsible for integrating psychological functioning. Accordingly, the goal of numerous psychotherapeutic approaches is to produce some reorganization or revision in the client's self-structure. Behavioral approaches to therapy, on the other hand, do not regard the self as a unitary personality construct. A number of learning theorists have emphatically rejected the traditional, cultural assumption that there is a single, united self at the core of each individual's being. For example, Cameron (1947) took the view that self-reactions—whether verbal or nonverbal, overt or covert—are simply acquired patterns of behavior. Rotter (1954) held a similar point of view in emphasizing the dependence of the self-construct on behaviors in particular situations. Skinner (1953) likewise rejected the concept of self as a mental structure or process entity, preferring instead to regard the self as simply a device for representing a functionally unified system of responses.

The Self-Control Construct

The concept of self-control may be viewed as a contemporary issue in human learning, insofar as self-control phenomena have been regarded for a long time as simply an extension of issues of learning theory. Thus learning theorists over the years have had much to say that was pertinent to the study of self-control. The following is a brief review of some of the major theoretical positions on self-control found in the learning/behavioral literature.
Dollard and Miller. One of the earliest, serious attempts to define theoretically the operation of the processes involved in self-control is the work of Miller and Dollard (1941) and Dollard and Miller (1950). A central concept in their theory of personality and behavior change is the complex problem-solving role played by "cue-producing responses" made by the individual. These cue-producing responses are defined as mental operations such as language, thinking, images, and the like, which mediate complex human behavior. The temporal and spacial patterning of these mediating responses facilitates the use of mental faculties in problem-solving. Mental attributes such as reason, logic, foresight, and insight are characteristically associated with the effective utilization of cue-producing responses. In many ways, the classic work of Dollard and Miller provided the foundation for subsequent investigation in the area of self-control.

Skinner. In Skinner's (1953) analysis of human behavior, self-control is regarded as behavior like any other behavior governed by the general principles of operant conditioning. That is, self-control is a function of personal history variables interacting with current environmental influences to create conditions for individual action. The individual exercises self-control when he deliberately influences the variables of which his behavior is a function. Whether this process involves arranging environmental conditions to increase the probability of the occurrence of positive reinforcement or punishment, or manipulating inner emotional and cognitive states to affect the emergence
of desired behaviors, the principles involved are considered generally the same. According to Skinner, the process of self-control involves the individual changing the probability of performing a behavior which has both reinforcing and aversive consequences, and selectively initiating a controlling response though the response to be controlled is more immediately rewarding. In Skinnerian terms, self-control is described as a process in which "an organism may make the punished response less probable by altering the variables of which it is a function. Any behavior which succeeds in doing this will automatically be reinforced. We call such behaviors self-control" (p. 230).

Bandura. Bandura (1969) conceptualized self-control phenomena within the framework of a reciprocal-interaction theory combining both mediational (i.e., cognitive) and nonmediational (i.e., behavioral) processes. For example, in accounting for the acquisition and maintenance of behavior change, Bandura asserted that reinforcement contingencies can significantly influence behavior without the individual having to be aware of the contingencies. However, individuals who have identified the contingencies governing their behavior are able to control their behavior to a greater extent than if such awareness were lacking. In short, Bandura favored a point of view that emphasized the role played by symbolic activity in human learning; he regarded the concept of self-reinforcement as central to the self-control process. Patterns of self-reinforcement are acquired and transmitted through social learning, and eventually become internalized as one's own standards of conduct.
In Bandura's view, self-control represented the interaction of these internalized standards of conduct with current environmental contingencies to produce complex social behavior.

**Cautela.** Cautela (1969) defined self-control as "a response repertoire in which an individual can make responses to increase or decrease a response probability that is perceived as injurious to the individual himself or to others" (p. 324). That is, self-control is conceptualized as the response of an individual that is emitted to control the probability of other responses. Cautela maintained that concepts typically associated with self-control such as willpower, volition, and self-discipline are not scientifically useful because they are not as experimentally verifiable as hypotheses couched in terms of controlling response probability.

**Kanfer and Phillips.** Kanfer and Phillips' (1970) approach to self-control relied heavily on Skinner's definition of the process. They considered the term self-control most appropriate for defining situations in which the behavior is initially under the control of two sets of conflicting reinforcing consequences. In their view, the process of self-control is one in which a person alters the probability of occurrence of a behavior by changing the variables that have controlled its occurrence in the past. In all cases, the definition of self-control requires that the individual himself be the one who initiates his own behavior change.

While Skinner's discussion of self-control focused mainly on the
case in which a controlled response is decreased or eliminated, Kanfer and Phillips' broader definition of self-control included the process by which a response is executed despite its aversive consequences. Accordingly, two major classes of self-control behaviors are distinguished. The first response class may be described as resistance to temptation, while the second response class may be illustrated by tolerance of noxious stimulation when an escape response is available. That is, self-control may be exercised in two types of situations: (a) a person fails to execute behaviors that gain him access to reinforcing events or stimuli; and (b) a person continues to tolerate aversive stimulation and fails to perform available avoidance or escape responses.

According to Kanfer and Phillips, in human situations involving self-control the response to be controlled has conflicting (i.e., positive and negative) consequences. It is only when the controlled behavior has immediate positive reinforcing value and long-range aversive consequences (e.g., drinking, overeating, smoking), or when it has immediate aversive consequences but long-range positive effects (e.g., heroic acts, physical exercises, tolerance of pain), that there is any question as to whether the person is exhibiting self-control. Both kinds of self-control—strengthening the resistance to temptation and increasing the tolerance to aversive stimulation—typically involve providing the individual with supplemental controlling variables to counteract the effect of the precurrent reinforcers. In short, Kanfer and Phillips defined self-control as either (a) the omission of behavior that leads to attainment of reinforcement or avoidance of punishment, or (b) the commission of acts that have known aversive consequences.
Goldfried and Merbaum. Goldfried and Merbaum (1973) viewed self-control as a process through which an individual becomes the principal agent in guiding, directing, and regulating those aspects of his own behavior that might eventually lead to desired positive consequences. These investigators assumed that environmental influences play a crucial role in determining the particular properties of the self-control sequence. Thus they viewed self-control as a skill learned through various social contacts, or more precisely, as a repertoire of effective self-control responses built up through continuous interaction with the environment. In addition, Goldfried and Merbaum emphasized that discrimination and problem-solving constitute an integral part of self-control, in that the individual must formulate a plan of action, apply basic self-control information and techniques to the situation, test the efficacy of the self-control operations employed, and evaluate the performance against personal standards of competence. Goldfried and Merbaum summarized their viewpoint by postulating the following working definition of self-control: "Self-control represents a personal decision arrived at through conscious deliberation for the purpose of integrating action which is designed to achieve certain desired outcomes or goals as determined by the individual himself" (p. 12).

Summary. Many of these diverse conceptualizations of self-control share in common the view that the act of self-control is mediated by cognitive processes. While some behavioral theorists have ignored the
individual's cognitive processes, the judicious reference to the role of mediational processes in human functioning may be regarded as perfectly consistent with a behavioral viewpoint (cf. Davison, Goldfried, & Krasner, 1970). Miller and Dollard (1941) and Dollard and Miller (1950) have labeled these intermediary internal behaviors as "cue-producing responses." The importance of mediating variables in explaining the process of self-control also has been stressed by Bandura (1969), Kanfer and Phillips (1970), and Goldfried and Merbaum (1973). All of these conceptions emphasized the central role of thought and language in delaying impulsive action, and in introducing a competing alternative into the self-regulatory sequence. In short, it is clear that these different approaches to behavioral self-control encompass both mediational and nonmediational components.

Clarification of Terms

For purposes of clarification, definition of the terms used with reference to the topic under discussion is in order. Individual variation in the use of such terms as "self-control," "self-regulation," "self-management," and self-modification" in the clinical and experimental literature has resulted in some confusion. For example, "self-control" has sometimes been used with reference to all attempts at self-induced behavior change (e.g., Cautela, 1969; Goldfried & Merbaum, 1973). At other times, "self-control" has been defined to apply only to instances of self-imposed response suppression (e.g., Skinner, 1953), while the label "self-regulation" has been used to denote all cases of self-
mediated behavior modification (e.g., Kanfer, 1970a). A number of investigators have presented discussions aimed at clarifying the definitions of these various terms (e.g., Goldfried & Merbaum, 1973; Marston & Feldman, 1972; Thoresen & Mahoney, 1974).

In the present endeavor, all of these labels are employed interchangeably to refer to any and all attempts at self-directed behavior change. That is, for present purposes each of these labels is used as a generic term to refer to any response made by an organism to change or maintain its own behavior. Thus these labels all refer to any response made by the individual to alter the probability of other responses. According to this conceptualization, the desired behavior change may be in the direction of either increasing or decreasing the occurrence of the target behavior. The essential requirement is that the individual himself is the agent of change. While the initiation and maintenance of self-change efforts may be influenced by external factors, the controlling variables of the target behavior must rest in the hands of the individual (Mahoney, 1972a).

In the absence of information regarding the variables controlling behavior, the term "self-control" is frequently applied indiscriminately in the labeling of insufficiently analyzed events. Indeed, many faulty attributions of self-control are made when external observers attach labels such as heroism, stoicism, or self-denial to certain behaviors. According to the present definition, the critical element in self-control is the individual's actions toward altering a strong externally-determined pattern of current behavior to meet a criterion which he has previously set and which is frequently hidden from the observer.
In the forefront of the present discussion is the quest for a clearer definition of self-control, one which is more consistent with experimental findings. At the same time it is imperative to work toward a definition of self-control that yields more useful experimental paradigms than is possible with less scientific definitions.

The self-control construct may be viewed perhaps most usefully as a generic term encompassing a range of procedures for modifying an array of problematic responses. Similarly, the term behavior modification --when viewed as the therapeutic application of general psychological principles for altering maladaptive behavior--encompasses a range of therapeutic procedures for altering a variety of problem behaviors. The same principles of behavior change underlie the use of self-control procedures. Another point of similarity is that the application of both behavior modification and self-control procedures is dictated by a careful assessment of the variables maintaining the maladaptive behavior in question. The central point of departure is that within the self-control framework the individual is explicitly trained to function as his own change agent.

Internal Versus External Control of Behavior: Theoretical Considerations

Due to the impracticality of continuous surveillance by external agents, the individual in society is expected to assume some internal control over his behavior by learning self-control. Indeed, generalized reinforcement is provided to children for the development of self-controlling responses throughout the process of socialization. The
child-rearing practices of numerous cultures reflect the assumption that a person can be taught to regulate the variables that influence his own behavior.

It is noteworthy that some extreme environmentalists have maintained that self-control essentially consists of certain forms of environmental control of behavior (e.g., Rachlin, 1970; Stuart, 1971). For example, in a theoretical discussion of situational control versus self-control, Stuart (1971) contended that self-control of behavior is somewhat of a myth in that all instances of so-called self-control are actually cases of situational, or environmental, control. He emphasized the role of environmental stimuli as an exclusive source of control in human behavior, pointing out that "the behaviors commonly ascribed to self-control can be functionally analyzed as a special subset of operant responses which are, in fact, under situational control" (p. 130).

In making the transition from environmental control to self-control, it is necessary to explain the process by which the individual disrupts a chain of behaviors at a particular point, initiates controlling responses that were learned previously in similar situations, and maintains the new behavior chain, although the controlled behavior has a high probability of occurrence and immediately reinforcing consequences (Kanfer & Karoly, 1972). The ubiquity and "portability" of self-generated controlling behavior indicate the utility of distinguishing it from cases in which behavior is a direct function of external controlling variables.

In discussing internal and external determinants of behavior, it is important to distinguish between the discriminative and reinforcing
functions of stimuli. Behavior is controlled not only by its reinforcing consequences, but also by environmental stimuli which signify the kinds of outcomes that are likely to follow certain courses of action. Thus much human behavior that seems to be internally directed may be in fact under the control of such discriminative cues. In some cases, the controlling external stimulus events are easily identifiable due to their distinctive properties, as for example in the case of a motorist waiting at a traffic light on a completely deserted street. While he appears to be displaying considerable self-control, his behavior is nonetheless clearly externally regulated by the behavior-directing function of the red signal light. In other cases, the external controlling events are not as readily apparent, with the result that internal controlling agents are invoked as an explanation (Bandura, 1969).

The issue of the internal versus external control of behavior is rendered more complicated by the fact that cues regularly associated with reinforcement eventually come to control the reinforced behavior. It is even more difficult to rule out external determinants for behavior which is under the discriminative control of such subtle stimuli as temporal cues. Clearly, there are serious problems in definitions of self-regulation which ignore the discriminative function of cues, and which use as a primary criterion the occurrence of the behavior in the absence of social surveillance. The question inevitably arises, if behavior is frequently externally regulated by stimuli not always apparent to the observer, why is it necessary at all to invoke an internal agency that presumably regulates the observed behavior?
A number of similar arguments have been advanced to account for instances of "self-control" without reference to the self-regulatory concept. However, none of these explanations seem to be able to account for how the individual can actively alter his behavior, and how such self-initiated behavior relates to other variables. The phenomena of self-control are defined by the absence of any current external reinforcement contingencies, and by the individual's selective manipulation of his environment in counteracting the natural effects of external control (Kanfer & Phillips, 1970).

Furthermore, while behavior may be multiply determined by a complex of external controlling stimuli, it is still necessary to explain individual differences in response to what appear to be essentially the same cues. Individuals are frequently observed to persist in behavior that receives little or no social support, and forego reinforcing activities that are readily available and socially sanctioned. Self-regulatory processes may account for these behaviors that appear to be partially independent of specific situational contingencies and outcomes.

The application of self-control procedures has been most widespread in the management of behaviors such as smoking, overeating, and drinking in which inherent gratification and environmental support create conflicting consequences, and external controls are not practical. Moreover, because society appears somewhat reluctant to infringe upon the individual's right to exercise his personal decisions in these areas, methods of environmental control have been applied sparingly to these behaviors. Indeed, the individual who attempts to stop smoking, overeating, or drinking frequently encounters a social community which
simultaneously offers both temptation and reinforcement for engaging in these behaviors.

Accordingly, as Bandura (1969) has emphasized, the establishment of self-control operations to supplement or replace external control systems is essential if desired behavior changes are to generalize and endure. This is particularly true in cases in which the physical and social environment provides inadequate support or conflicting patterns of reinforcement for the newly learned behavior. Certainly, behavior change is more likely to stabilize and endure when the individual engages in selective association with people who hold similar behavioral norms, thereby providing social (i.e., external) support for his behavior.

It is important to note that the individual may initiate behavior change by requesting others to manipulate either stimulus control or response consequences in such a way as to alter the probability of the target behavior. In this instance of self-control, the person in effect increases his self-control by turning over control to others in his immediate environment (Kanfer, 1971). A variety of such arrangements for facilitating self-control are encountered in everyday life. An example of the use of such controlling devices is the obese person turning over his money to a companion before entering the grocery store, or the alcoholic asking his friend to remove him physically from the cocktail party after his third drink.

In addition, while self-control behavior may originate ultimately in the physical and social environment of the individual, the sum of the individual's experiences may equip him with the skills for controlling his own behavior by arranging the influences to which he exposes himself.
The individual's past experience in controlling his external environment and in securing reinforcement for such control plays a large role in determining his success with methods of self-direction.

Specific self-control responses may be treated as any other operant behavior, since they are influenced by the same principles of learning. Accordingly, self-control behavior may be systematically shaped. Indeed, if reinforcement is not properly provided, self-control may be rapidly extinguished particularly during the early stages of learning. For this reason, in teaching self-control it is important that the individual start with some self-regulatory behavior, however small, in his response repertoire and gradually learn through successive approximations more complex sequences of self-controlling responses.

An underlying aspect of all self-controlling responses is their utility for providing the individual with an improved adjustment to the physical and cultural demands of his external environment. That is, self-controlling behaviors are aimed at optimizing the opportunities for the person to obtain those reinforcements available in his physical and cultural setting that are most appropriate for his personal welfare and continuing development. In short, self-controlling behaviors function to alter the consequences of the individual's own behavior as a means of maximizing the reinforcement potential of the environment (Kanfer & Phillips, 1970).

Accordingly, as suggested by Kanfer and Karoly (1972), the scope of self-control appropriately includes increasing the probability of approach to or tolerance of an immediately aversive situation in order to achieve long-range positive outcomes (e.g., encouraging an
overweight person to exercise strenuously, presenting a phobic client with feared objects, or keeping an uninterested student in school); or decreasing the probability of approaching an immediately rewarding situation in order to avoid long-term negative outcomes (e.g., inhibiting the alcoholic's drinking, the smoker's smoking, the obese person's overeating).

Kanfer (1971) laid the theoretical foundation for understanding self-control by presenting a conceptual analysis of self-regulatory processes which delineated three major components: first, the means by which the individual influences his own behavior by self-produced consequences (i.e., self-reinforcement); second, the means by which the individual responds to feedback effects of his own actions through self-observation (i.e., self-monitoring); and third, the means by which the individual initiates behavior change by arranging conditions producing optimal reinforcement of a new behavior (i.e., self-control).

Kanfer and Karoly (1972) further advanced the theoretical understanding of self-control by outlining a detailed componential analysis of the process by which the person alters or maintains his own behavior in the absence of immediate external supports. Of course the individual never ceases to be affected by external controlling events; the analysis of self-control variables takes on particular importance due to their potential for supplementing these external influences. In Kanfer and Karoly's conceptual analysis, self-regulation is viewed as a process involving the introduction by the individual of supplementary contingencies designed to enable him to alter an ongoing behavioral
chain. In addition to incorporating significant individual factors (e.g., personal learning history, motivation for success), their working model divides self-regulation into three basic processes: self-monitoring, self-evaluation, and self-reinforcement. According to this operational model, which is derived extensively from systems theory, the process of self-regulation begins with the self-monitoring of input from both the external environment and internal response-produced cues (i.e., proprioceptive, autonomic, and verbal-symbolic stimuli). The individual then engages in self-evaluation consisting of a discrimination or judgment regarding the adequacy of his performance relative to a subjectively-held standard or comparison standard. Within the limits of the person's social learning history and current situational factors, the judgment serves as a discriminative stimulus either for positive self-reinforcement if the outcome of the comparison is favorable, or for aversive self-stimulation if the comparison is unfavorable. In short, according to this closed-looped learning paradigm of self-regulation, behavior may be altered and maintained by self-reinforcements, relatively independent of external controlling variables.
CHAPTER II

STUDY IMPROVEMENT AS A TARGET OF INTERVENTION:
A RATIONALE

This chapter offers an introduction and rationale for the focus on study behavior as a target of intervention within the framework of behavioral self-control.

Role of Studying in Education

The act of studying on the part of the student constitutes an integral part of the process of learning, at least in the pursuit of formal education. There is little question that studying represents one of the most critical behaviors of the student involved in the learning process. Indeed, the term "student" taken in its literal meaning translates "one who studies." Accordingly, the role of the student in the educational process is defined in terms of such study behaviors as attending to learning materials, reading textbooks, taking notes, writing papers, and completing classroom and homework assignments.

In many educational settings, academic instruction which takes place primarily within the context of the classroom constitutes the major vehicle for learning. Students in these settings are required to perform such in-class study behaviors as attending to classroom work, listening to presentations, and engaging in "on-task" behavior; generally they are not required to engage in independent studying outside the classroom, as in the completion of homework assignments.
These learning conditions are likely to prevail in the education of younger student in elementary and intermediate school.

In educational settings for the older student, however, studying independently outside of the classroom is likely to constitute an important academic requirement. In high school and college, for example, one of the most crucial role behaviors of the student is studying on his own. Although classroom learning in the form of lectures and discussion still represents an integral part of the student's education in these settings, substantial learning also occurs through independent study (i.e., reading textbooks, reviewing lecture notes, writing papers, completing homework assignments, etc.). Since the study behavior of concern is frequently that which takes place outside the confines of the classroom, it is critically important for the student to acquire effective study skills and methods. It is also essential for the student to learn to manage his study behavior so that he can develop good study habits and, most important, make himself study when he needs to do so. Indeed, one of the fundamental requisites of successful academic performance is the student's ability to get himself to engage in effective studying behavior.

Certainly, training students in the efficient management of study behavior as well as in the use of effective study habits represents a critically important area of research in education. Effective study behavior has long been acknowledged as one of the prime determinants of successful academic performance. For example, Fox (1962) underscored the significance of the role of studying in education thusly:
It attests to the importance of the problem that poor study habits are a recurrent concern of educators despite the fact that the problem has been around for a long time. .... it is the student, in the final analysis, who sets the standard of education. He sets this standard by his study behavior. Students are the most important instructors in the college. No matter how brilliant the lectures or how good the facilities, most students would fail if they did not teach themselves by study outside the classroom, and it should be conceded that most of them would pass if they studied arduously and received only assignments from their professors. It would seem that a concern for the improvement of college instruction would lead us first to examine the methods of studying. That the student is seldom thought of as an instructor, in the truest sense of the word, is really the most startling indictment of our prevalent educational philosophy. When we see the student as what he is--the primary tool of educational methodology--the problem of establishing effective study habits takes priority over all others faced by a college. The issue of efficient education pivots on the study behavior of the student. (p. 76)

Fox also recognized the relationship of effective study habits to personal adjustment:

The importance of study habits extends beyond the formalities of subject-matter education. The products of poor study habits are both cause and consequence of much of what is called "personal maladjustment." The problem is a frequent occasion for visits of students to college clinic and counseling centers. That the consequences of poor study habits are fundamental expressions of repeated failure should give pause to those who would discount the problem as simply a manifestation of some more basic disorder. Four years of nagging anxiety combined with either failure or compensating behaviors of cheating, meaningless memorizing (cramming), and disguising ignorance, must have their effect. The problem may have far more relevance to what is called mental hygiene than is commonly believed. (p. 76)

Although Fox's comments on studying were made in the context of the college environment, his points are pertinent, nevertheless, to
virtually all educational settings. Clearly, the focus on study behavior by a burgeoning amount of research in educational settings is both appropriate and relevant.

### Improvement of Study Habits and Skills

What follows is a portrait of the typical student in quest of that elusive goal, effective study methods. Typically, the student develops study methods largely on his own, picking up and trying out various study hints and tips commonly available in the student marketplace. He learns to study as best as he can, using and dropping study techniques through a process of trial and error. Over the years, he acquires as part of his own personal study arsenal a hodgepodge of inefficient, if not ineffective, methods of study. At some point he takes the effort to read a how-to-study manual, attempts to try out a few of its suggestions but does not bother to use them with any consistency. If he takes the time to find out what other how-to-study materials say, he encounters a multitude of study suggestions contained in a myriad of how-to-study manuals, many of which provide conflicting advice. As a result, he ends up where he started, left up to his own (study) devices.

Since their appearance in the 1920's, a proliferation of how-to-study books has exploded on the educational scene. These myriad study manuals have been designed expressly to help the student to study more effectively and efficiently (e.g., Brown & Holtzman, 1972; Pauk, 1962; Robinson, 1941, 1946, 1961). They generally have shared many features
in common, including suggestions on such topics as study skills, preparing reports, examination skills, taking notes, classroom skills, increasing concentration, reading and writing skills, etc. The primary thrust of these approaches to effective study has been on providing the student with a set of guidelines, rules, and methods for improving his study skills. The major emphasis in these attempts at study improvement has been upon encouraging the student to follow a step-by-step outline of instructions aimed at increasing his study effectiveness and enhancing his academic performance.

As a whole, the work to date on the instruction of students in effective study habits represents a considerable array of reasonably sound advice to students. Empirical evidence for the actual efficacy of putting these tips and hints into practice, however is singularly lacking. The basis for the large majority of study-improvement suggestions found in these works appears to rest on intuition and common sense, rather than on experimental findings. Clearly, there is a compelling need for much of the content of these how-to-study manuals to be empirically tested and experimentally validated. Until such controlled research is conducted, the utility of these study-aid materials should be viewed with caution.

Aside from the general lack of empirical data on their effectiveness, how-to-study approaches to study improvement have been plagued with another serious deficiency. As sound and useful as how-to-study instructions may be, it is entirely another question whether students actually take the effort to follow them. This problem of implementation of suggested study procedures has represented a major
limitation in the usefulness of these study-improvement approaches.

Indeed, each new generation of how-to-study books in the intervening years since their inception has attempted to incorporate procedures expressly devised to remedy this very problem. The majority of approaches to study improvement, especially the earlier ones, consisted entirely of advice on how to study, with the rationale and relevance of any particular point left completely up to the student-reader. It soon became apparent, however, that mere reading of how-to-study instructions did little good. Some how-to-study books have attempted to provide more explicit justification for the use of suggested study methods, with the aim of encouraging the student to actually make use of them. Other study manuals have prepared practice exercises to be undertaken throughout the reading of the text, as a prod for the student to implement the suggested study techniques as soon as possible after reading about them. It became evident, however, that while such practice exercises got the student to try out the study methods suggested, they failed by and large to influence him to continue to implement the techniques, or to apply them to studying in his day-to-day coursework. Still other, more recent study-improvement books have included built-in procedures for the student to obtain ongoing feedback on his progress as a result of using the suggested methods of study.

Training in effective methods of study can be of little value unless the student realizes its importance and relevance, and considers it worthwhile to expend the effort required for improvement. That is, he must sincerely desire to improve his study skills before any study-
improvement endeavor can be of any assistance. Simply stated, the student must get himself to do the work required by the program. Mere exposure to a how-to-study program is not enough in helping him, for more than knowledge is required to improve study skills and study habits. It is necessary for the student not only to know what effective study skills are, but also to practice them until they are acquired and firmly established in his repertoire. Accordingly, an effective how-to-study approach is not a program of reading, but of practice. If the student is to learn better study skills and habits, it is essential that, as soon as possible after reading the suggestions for study improvement, he actively tries out the suggested study methods and continuously applies them until they are fully mastered.

There is one study-improvement approach reported in the how-to-study literature that stands out as singularly impressive, with respect to both its empirical support and its calculated attempt to elicit the active, complete involvement of the student-reader. Robinson's (1946, 1961) S-Q-R-R-R method of study has gained widespread acceptance and usage over the years. The SQ3R method of study consists of higher-level skills training designed to improve the student's quality and efficiency in studying. This study method requires the student to progress through five critical stages in mastering the material to be learned: survey, question, read, recite, and review. The student is instructed to apply each of these five activities to successive segments of the learning material. Robinson's analysis of the critical ingredients of effective study has resulted in a system of studying that is superior to other methods commonly used by students. Indeed, the SQ3R study
method is widely recognized as one of the most effective means of study presently available. In contrast to other study methods, the SQ3R method of study has received some experimental support attesting to its effectiveness in improving study and academic performance (Robinson, 1961). In addition, Robinson's study method has combined four features designed to increase the likelihood of the student-reader's active and continuous implementation of the steps outlined in the book: (a) individualization involving ongoing feedback of progress in learning and using the new study skills; (b) practice exercises requiring actual practicing and implementing of suggested study methods; (c) transfer of study skills to studying in coursework; and (d) presentation of the rationale underlying usage of suggested study methods, coupled with exhortation to exercise self-direction and self-motivation in putting them into practice. As a result of its empirical support and its innovative features, Robinson's SQ3R study method, or some variation of it, has been included in most how-to-study books since.

Even Robinson's relatively sophisticated approach to effective study, however, has run squarely into the problem of the student who reads the manual but fails to apply the methods contained in it. In fact, this failure of follow-through is an especially salient problem for students using Robinson's method of study, since the SQ3R study method is relatively complicated, varies substantially from students' customary study habits, and requires considerable effort to learn to use it. As Robinson (1961) himself has emphasized, it is the student who must provide the self-motivation and self-direction to do the work of the program and carry out the suggested study methods. Research in the
application of Robinson's study-improvement program has shown that those students with higher grades to begin with have been the ones who have gained the most from it (Robinson, 1961). Thus those students whom the how-to-study program most needs to reach and help are frequently the ones who get the least out of it, or who fail to follow-through and eventually drop out. The implication of these findings is that students with above-average grade-point averages appear to be able to bring the self-motivation necessary to enter and carry out the study-improvement program, whereas students with below-average grades seem to lack the self-motivation both to want to improve their study methods and to actually implement them even if they wish to improve. But then it is this same lack of self-motivation that apparently contributes to their poor academic performance in scholastic endeavors to begin with.

Certainly, there must be a better way for students to learn effective study skills. Although virtually all academic institutions offer a how-to-study course as part of the curriculum, a relatively small percentage of students enroll in such courses. What is needed is a study-improvement program which is partly self-instructional, yet at the same time, is equipped with both internal and external motivational features for keeping the student interested in actively applying and continuously carrying out suggested study methods. In this connection, the question arises as to whether or not greater academic improvement results from courses employing Robinson's method of studying versus independent attempts at following Robinson's how-to-study book on one's own. It would be expected, of course, that the inclusion of study-
improvement efforts within the structure of a course would provide the external motivational support for increased involvement on the part of participants. Unfortunately, experimental research on this important issue is sorely lacking.

In summary, the how-to-study literature has had limited success in the improvement of the study skills and habits of students. In addition to a general absence of experimental validation for many of the specific study methods contained in how-to-study manuals, these approaches to study improvement have encountered a major difficulty in motivating students to actually implement the suggested procedures. Even Robinson's widely used SQ3R study method suffers from such failure in follow-through. Moreover, the finding that it is the better students, as opposed to the poorer students, who benefit from such programs indicates that those students who most need study improvement are the ones least likely to seek it, or follow-through in effecting it. These results reflect a major limitation of these approaches to the improvement of studying.

It is clear that study-improvement efforts must go beyond merely telling the student what he is doing wrong, or just giving him information on how to study effectively. For, as is true for most skills, the mere desire to improve, coupled with instruction on how to do it, cannot in themselves guarantee that effective study methods are used. It is necessary that how-to-study approaches include explicit procedures for persuading the student to engage in actual practice of suggested study methods until mastery is achieved. In short, it appears that the major problem in improving the study habits of students is not developing a
set of well-defined principles and methods for effective study, but rather transmitting this information to students and persuading them to use it.

A Behavioral Analysis of Studying

A behavioral analysis of studying is offered in an attempt to provide some concrete solutions to the problems faced by study-improvement programs in eliciting and maintaining the participation of students. The present endeavor explores a number of ways, based upon behavioral principles, of enhancing students' motivation and involvement in programs for study improvement. Specifically, an analysis of study behavior within a behavioral framework is presented with the aim of developing (a) improved study methods and (b) effective motivational procedures. Specification of the variables which affect study behavior in terms of learning principles may lead to improved study methods. Additionally, specification of the determinants of studying within the context of behavioral self-control may yield effective motivational procedures.

The improvement of study and academic performance may be achieved through the application of any of three general strategies: (a) through external control involving the manipulation of the student's environment, including the behavior of significant others, in such a manner as to elicit and maintain study behavior, (b) through self-control involving the training of the student to manipulate his own behavior and environment
in such a way that study behavior is changed from a low-probability to a high-probability response, and (c) through a combination of external control and self-control.

External Control of Studying

A central tenet underlying a behavioral approach to therapeutic intervention is the assumed functional relationship between the individual's behavior and the environment in which it occurs. In this view, behavior is governed by certain principles of learning, which attempt to specify the relationship between behaviors and controlling events in the environment. By carefully examining the situations in which the individual's behaviors occur, it is possible to specify the particular environmental conditions which are maintaining the particular behaviors. It follows, then, that the appropriate locus for intervention aimed at effective behavior change is the environment of the individual. Such an intervention strategy relies heavily on the direct manipulation of the individual's physical and social environment as a means of exerting external control of behavior.

Accordingly, studying as operant behavior is greatly affected by the environmental context in which it occurs. Study behavior may be conceptualized as embedded within an environmental configuration consisting of antecedent and consequent events. The events which immediately precede and follow studying exert a powerful influence on its occurrence. The environmental stimuli antecedent to studying set the occasion for the occurrence of study behavior, whereas the events
subsequent to studying act as powerful consequences in affecting the frequency of study behavior. If external control of studying is to be obtained, it is necessary to manipulate the environment in which study behavior occurs such that studying is facilitated. Specifically, by arranging the antecedent-and-consequent-events configuration in which study behavior occurs, infrequent or ineffective studying can be extinguished and regular or efficient studying can be supported. It follows that study-improvement methods should focus on altering the relevant antecedents and consequents of studying as a strategy for decreasing the probability of undesirable study behavior and increasing the likelihood of desirable study behavior.

In this connection, an important vehicle for the external control of study behavior is behavioral group treatment. The application of behavioral treatment in groups gives rise to an external environment in which effective study behavior can be taught and fostered. The use of regular small-group meetings affords the environmental structure and support for the acquisition and maintenance of effective study behaviors on the part of group members. The group serves as a medium for discussion of study problems, instruction in effective study skills, prompts to implement suggested study methods, and reinforcement for attempts to develop effective study habits. Such a group environment provides powerful discriminative stimuli and reinforcement contingencies for the learning of desirable study behaviors. In effect, the group acts as an external, albeit artificial, environment for prompting and rewarding desired study behaviors in participants. As such, it serves both an educational and a motivational function.
Self-Control of Studying

Another source of control in human behavior viewed within the framework of behavioral theory is the self-control of behavior. Self-control in behavioral terms refers to the individual’s learned repertoire of responses for controlling the variables which affect his behavior. More specifically, behavioral self-control is conceptualized as a repertoire of skills for controlling one's own behavior through judicious self-management of the environment of which behavior is a function. While remaining within a behavioral frame of reference wherein the environment is viewed as a major determinant of behavior, the focus merely is shifted to encompass the training of the individual to assume greater control of his everyday environment as a means of gaining more control over his behavior. In effect, the individual is taught to control the controlling variables of which his behavior is a function. Accordingly, the primary strategy in this approach consists of instructing the individual in self-regulatory procedures with which to manipulate his environment such that desired behaviors are fostered and undesired behaviors are eliminated. This behavioral model for the learning of self-control is based on the application of empirically-derived principles of behavior change.

Thus a viable, alternative strategy in behavioral intervention for study improvement is training students in the self-control of studying behavior. The emphasis in this approach is upon instructing the student himself in the means with which to gain personal control over his own study behavior. Since studying is influenced strongly by the environment in which it occurs, it follows that the study behavior
of the individual may be controlled through his manipulation of his own study environment. Accordingly, the student is taught explicit methods of behavioral self-control for managing his study environment and ultimately his study behavior more effectively.

The use of a self-instructional manual affords an appropriate vehicle for training students in behavioral self-control methods for study improvement. The written presentation of instructional materials is designed as a completely do-it-yourself enterprise. By reading and following the instructions contained in the study manual, the student learns a series of strategies for enabling him to acquire greater self-control over his study behavior. The study manual guides him through a specific sequence of steps in the self-application of behavior change procedures for study improvement. In particular, the manual instructs the student in how to arrange his study environment such that effective study behaviors are initiated and maintained. The major emphasis is on teaching the student to manage his environment so that it works for and not against his efforts at attaining greater control of his study behavior.

Combination of External and Self-Control of Studying

A third behavioral intervention model for the treatment of problematic human behavior is the use of external and self-control of behavior, combined. This treatment approach employs simultaneously strategies of behavior change which encompass both external manipulation of the individual's environment and self-manipulation of his own
environment. While external contingencies are placed on the behavior of the individual through the intervention of external agents, the individual supplements these environmental contingencies with some of his own self-imposed ones. As a consequence, his behavior comes under the control of both externally-determined and self-determined contingencies. Thus the concurrent applications of both external and self-control of behavior are not incompatible operations, but complementary ones.

Thus another behavioral treatment approach for the improvement of study and academic performance consists of the combined application of external control and self-control of studying. Such an intervention approach may be employed through the combined use of (a) group treatment and (b) self-instructional manual. In this treatment format, the student reads and follows the self-instructional study manual in conjunction with regular group meetings. This intervention format serves as a vehicle for the provision of both external and self-motivation in attempts at study improvement by the student.

A Behavioral Intervention Model for Study Improvement

The present endeavor represents an effort to develop a behavioral intervention model focusing on self-control for the improvement of study and academic performance. The theoretical framework for this treatment approach is derived from learning theory and is aimed at providing a conceptual framework for the self-modification of ineffective study behavior. This self-treatment model represents a systematic attempt to
apply the principles and techniques of behavior modification to facilitate study self-improvement.

The development of self-management skills for studying represents a central intervention strategy in the present behavioral treatment model for study improvement. This approach to the self-improvement of studying consists of three parts, corresponding to each of the major classes of self-control methods. First, self-monitoring is introduced as an integral part of any attempt at study self-improvement, and the student is instructed to keep an accurate and ongoing record of all study times throughout the day. Second, stimulus control is described as a method for facilitating the occurrence of studying through prior arrangement of the environmental stimuli which set the occasion for the act of studying. Thus the student is encouraged to arrange regular times and places to study in accordance with a study schedule, so that these stimuli come to serve as eliciting cues for the occurrence of studying behavior. Third, contingency management is taught as a strategy for strengthening study behavior through manipulation of the environmental events that follow studying. Accordingly, the student is guided step-by-step in the use of such behavior modification procedures as shaping, self-reinforcement, and self-contracting.

The student is instructed in these self-directed behavior change strategies and procedures as the central basis for his attempts at study improvement. He is taught how to go about changing his study (and social) environment in ways that reward and support the kinds of study behaviors he wants, and extinguish the kinds of study behaviors he does not want. It is emphasized to the student that he is learning
not only effective ways of studying, but also self-change strategies that allow him to continue to self-improve his study behavior over time. In short, these behavioral self-control procedures enable the student to assume increased responsibility for his study life and to generate self-maintenance of changes in his study behavior. The major procedures comprising a behavioral self-control approach to the improvement of study and academic performance are outlined below.

**Behavioral Self-Assessment**

A basic prerequisite in setting up an intervention program for study self-improvement is the systematic self-exploration of the environmental conditions maintaining maladaptive study behaviors. The student is taught to observe the environmental circumstances immediately preceding and following the occurrence of study behavior. By taking note of the antecedent-and-consequent-events configuration in which his problem behaviors occur, the student may obtain a useful understanding of the relationship between certain of his troublesome study behaviors and the environmental events surrounding them. In this way, he may arrive at viable hypotheses as to the environmental stimuli which are precipitating and maintaining his problematic study responses. Armed with this knowledge, he then may devise self-treatment strategies aimed at altering his immediate environment in ways which support desirable study habits and extinguish undesirable study habits.
Self-Monitoring

Central to a behavioral approach to the self-improvement of study and academic performance is the prominent role of continuous data collection by the student. An abiding characteristic of a behavioral model of intervention is a methodology placing heavy reliance on empirical data as the basis for evaluating progress and making treatment decisions. Accordingly, the student is trained to self-monitor and self-record his study behavior throughout his attempts at study improvement. In doing so, the course of his self-improvement program at each step of the way is guided carefully by the self-recorded data. In addition to its value as a method of data collection, self-monitoring of studying is useful as a means of providing the individual with valuable information regarding his own study behavior. By keeping accurate and continuous records of his study behavior, the student may obtain a better understanding of the factors which control his studying. Self-monitoring also provides a system of ongoing feedback to the student as to the current level of his studying performance in relation to his study goals. As a result, under certain conditions self-monitoring of studying may have an intervention effect in altering the observed behavior; that is, the student's frequency of studying may increase as a result of the self-monitoring of his study behavior.

Self-Directed Stimulus Control

The self-application of stimulus control is based on the premise that the environmental events which occur immediately before studying
exert a powerful influence on study behavior. Accordingly, the antecedent events that set the occasion for the act of studying can be arranged so as to facilitate study behavior. Conversely, the environmental stimuli which are not conducive to the occurrence of studying can be removed so as to eliminate behavior that is incompatible with studying. The student is instructed in the self-implementation of stimulus-control procedures as a means of bringing his study behavior under the control of certain environmental stimuli, thereby facilitating studying.

**Contingency Self-Management**

A fundamental premise underlying a behavioral approach to study intervention is that the individual's behavior is influenced to a large extent by its consequences. Positive consequences strengthen behaviors they follow, while negative consequences weaken behaviors. It follows that desirable study behaviors may be fostered by arranging the environment in such a manner that their occurrence meets with favorable consequences. Conversely, undesirable study behaviors may be extinguished by managing the environment in such a way that their occurrence meets with no consequences or unfavourable consequences. The student is instructed in the self-application of reinforcement and punishment contingencies to his studying behavior as a form of contingency self-management.
Self-Shaping

One of the most important behavioral self-control techniques for facilitating the learning of study behavior is self-shaping, which is a method of self-requiring and self-rewarding successive approximations to the achievement of behavioral goals. Reinforcement in the form of material and activity rewards is self-determined and self-administered by the student, contingent upon his making gradual progress toward his study goals. The desired terminal behavior is broken down into small manageable steps, and the student rewards himself continuously as he accomplishes each step in turn. It is essential that the student does not expect too much at once from himself, and that he self-reinforces initial attempts at engaging in studying behavior, however little or ineffective. The criterion for dispensing self-reinforcement is raised progressively as the student masters the more difficult steps in the learning process.

Contingency Self-Contracting

The use of contingency self-contracting is another behavioral self-control method for modifying study behavior. The student is taught to draw up and put into effect study self-contracts which set explicit rules regarding what amount of studying earns what amount of reinforcement. These rules may be extended to specify the particular circumstances and conditions under which study behavior is to take place. Such rule-setting can exert a powerful effect on the occurrence of study behavior. The study self-contract also specifies the criterion self-shaping steps
and the contingent self-reinforcements available to the student for fulfillment of the terms of the contract.
CHAPTER III
THE EXPERIMENTAL PROBLEM: SELF-CONTROL OF STUDYING

One particularly challenging area in which behavioral self-control procedures have been applied is the educational setting. There has been a growing interest in recent years in developing a behavioral approach to the self-control of pertinent academic behaviors. In particular, studying behavior has served as the focus of an increasing number of investigations in behavioral self-control. This chapter reviews past and current research in which studying has constituted the target behavior of self-control efforts.

**Studying as a Target of Self-Control**

It is not surprising that research attention in behavioral self-control has begun to center on study behavior as there are a host of advantages in focusing on studying as a target of attempts at self-control. First, the behavior of studying may be included readily and meaningfully within a self-control paradigm. Second, the availability of large populations of students interested in improving their study and academic performance facilitates obtaining Ss for research. Third, high frequencies of studying qualify as socially desirable behavior, the promotion of which is regarded as worthwhile by social agents; conversely, low frequencies of studying constitute a socially significant problem, worthy of behavior change efforts. Fourth, studying as behavior is discrete and may be objectively defined; accordingly, the act of studying
may be reliably observed, counted, and recorded. Fifth, changes in the frequency of studying may translate into improvements in academic performance, which may be independently, nonreactively, and reliably measured by grades in coursework. Sixth, as a dependent variable studying may be linked with and corroborated by a number of related concomitant measures--such as test performance, homework completion, and course grades. These important characteristics of study behavior render studying a highly suitable object of scientific scrutiny in educational settings in general, and an appropriate target of experimental research in self-control in particular.

Behavioral Self-Control of Studying: A Review

The present section provides a review of the literature to date on the behavioral self-control of studying. Since research in this domain is still at a formative stage of development, there have been relatively few investigations which have attempted explicitly to improve study and academic performance within the framework of behavioral self-control. Each of the studies in this area is presented in approximate chronological order of its appearance in the literature, and is reviewed critically with respect to both its methodology and its results.

Research has focused upon the application of self-control methods to two separate classes of responses--in-class study behavior and outside-class study behavior. This review gives cursory coverage of the within-classroom studies and extensive coverage of the outside-classroom studies, since the latter has more direct relevance to the
present endeavor.

Self-Control of Studying Inside the Classroom

There have been a series of recent studies which have employed behavioral self-control procedures in the development and maintenance of study behavior within the classroom. The following investigations are representative of the various attempts to alter in-class academic behavior through self-control methods.

Lovitt and Curtiss (1969) investigated the self-control of academic responses by a twelve-year-old child in a token economy class as a function of teacher- and self-imposed contingencies. The findings of the study indicated that self-imposed contingencies produced a greater increment in academic response rate than teacher-imposed contingencies, even when the external contingencies were identical to the self-imposed ones. The classroom's token economy, however, renders the experiment less representative of conditions in the natural environment, as reinforcement remained in actuality in the hands of the teacher and the experimenter.

In a similar study, Johnson (1970) compared the effects of self-reinforcement and external reinforcement on the academic behavior of inattentive first- and second-grade boys. The results indicated no significant differences between self-controlled and externally-controlled reinforcement in the maintenance of target response rate. These findings were mitigated, however, by the fact that self-administered reinforcers were obtained from the experimenter.
Glynn (1970) examined the classroom applications of self-determined reinforcement. He found that self-determined and experimenter-determined, self-administered reinforcements were equally effective with respect to each other, but superior to no reinforcement and chance-determined, self-administered reinforcement in the modification of academic behavior in the intermediate school classroom. The study was marred by the limited range of academic performance standards available for self-selection and the apparent modest value of the back-up reinforcement.

In an important investigation of behavioral self-control of on-task behavior in an elementary school classroom, Glynn, Thomas, and Shee (1973) trained second-grade children to engage in self-assessment, self-recording, self-determination of reinforcement, and self-administration of reinforcement. The results showed that these behavioral self-control procedures maintained on-task academic behavior at the same high level as externally-administered reinforcement procedures. In reality, however, self-control operations were only partial in that external agents continued to exercise subtle external control.

Felixbrod and O'Leary (1973) employed a sound experimental design in comparing the effects of self-determined and externally-imposed reinforcement contingencies on children's academic behavior. The data indicated that the self-determined reinforcement condition resulted in academic performance that was equal to the yoked externally-controlled reinforcement condition and superior to the non-reinforcement control
condition. The experimental procedure minimized the extraneous influence of external contingencies by requiring the experimenter to be absent when Ss self-determined their academic performance standards in the self-determined reinforcement condition.

Summary and Conclusions. Viewed collectively, the above investigations (Felixbrod & O'Leary, 1973; Glynn, 1970; Glynn et. al., 1973; Johnson, 1970; Lovitt & Curtiss, 1969) provide some experimental support for the effectiveness of behavioral self-control procedures with academic behavior in the classroom. The experimental shortcomings of these studies relate to the methodological difficulty of completely removing the effects of external contingencies from the self-control operations. The presence of such contingencies is virtually inescapable in naturalistic settings such as the classroom. Even carefully executed laboratory experimentation in self-reinforcement such as that of Bandura and Perloff (1967) and Speidel (1972) cannot eliminate completely the subtle influences of external contingencies. Furthermore, studies in which Ss are provided with opportunities (a) to self-determine reinforcement from an array of reinforcers predetermined by the experimenter, and (b) to self-administer reinforcement contingent upon performance of behaviors predetermined by the experimenter, do not approximate sufficiently the conditions of self-control extant in the natural environment. It is important that further investigations resemble more closely naturalistic conditions of self-control by allowing Ss freer opportunities for self-determining and self-administering reinforcement.
Self-Control of Studying Outside the Classroom

There have been a number of research investigations which have explored the application of self-control techniques in the development and maintenance of effective study behavior outside the confines of the classroom. The following studies trace chronologically the evolution of research in the behavioral self-control of outside-class studying over the past decade.

One of the earliest attempts at instructing students in the use of self-control procedures was reported by Fox (1962), who demonstrated the successful application of environmental planning strategies for developing appropriate study skills. His study presented an excellent outline for the use of stimulus-control methods in promoting efficient study behavior in college undergraduates. Students were instructed to design an environment conducive to studying through the establishment of strong and direct associations between specific environmental stimuli and study behavior. Thus studying behavior—and only studying—was to occur in one place; all other behaviors incompatible with studying were to take place elsewhere. For example, if daydreaming occurred during studying, the student was to leave his study place immediately in order to prevent an inadvertent association of such inappropriate activity with his study place. Other treatment procedures included the use of reinforcement, shaping of gradually lengthier study assignments, and a structured format for studying in the form of the SQ3R study method (Robinson, 1961). Self-monitoring also was employed to determine when to continue or terminate studying.

In short, three fundamental strategies were employed in Fox's
approach to the acquisition of effective study skills: (a) placing the initiation of study under stimulus control, (b) making the study occasion an effective stimulus for good study habits, and (c) ensuring the continuation of the study program by the student with minimal professional help. The self-application of these various intervention strategies was taught to five student-volunteers. Each of these students met individually with a counselor for five to ten minutes every day throughout the quarter. During the subsequent quarter, all students reported the continued use of the study procedures, and all showed a significant improvement in grades in coursework. Improvement ranged from a minimum increase of one letter grade to a maximum of four (i.e., one student progressed from an F average to a B average). Fox termed the results of the study "promising," and attributed the success of the program primarily to the use of stimulus control.

Although data records on study behavior were kept by Ss, these apparently were not turned in to E. As a result, the meager presentation of data coupled with the complete absence of controls severely limits the strength of Fox's conclusions. Nevertheless, this pilot attempt to develop a behavioral approach to effective study stands as a pioneering investigation with important implications for self-control.

Fox's approach to academic improvement is noteworthy due to its emphasis on getting the student to actually use the study methods which he is taught. A major assumption underlying Fox's program in teaching the student sound study habits is that effective study skills are useful only to the extent that they can be transmitted successfully to the student: "It is one thing for the student to listen and follow the
the exposition of effective study habits; it is another thing for him to put these habits to use outside the classroom" (p. 75).

A major thrust of Fox's approach to effecting the use of efficient study habits is the attempt to get the student to carry out the program with minimal professional input. In fact, Fox conceptualized his approach as an attempt at the "semi-automation of counseling," in which many students could be reached at reasonable cost using few professional counselors, thereby freeing the professional to devote his time to special cases. Accordingly, Fox suggested that his study-improvement program be implemented through a written, self-instructional book, using other students as much as possible as counselors. In spite of these emphases, however, at no point throughout his work does Fox go beyond merely implicitly recognizing his study-improvement methods as self-control procedures.

One of the first investigators to explicitly acknowledge and conceptualize his behavior change procedures within the framework of behavioral self-control was Goldiamond (1965), who presented a series of case reports in which self-control procedures were applied to an array of personal behavior problems. Two of these cases involved college students in academic difficulty. Goldiamond's treatment regimen primarily called for the self-implementation of stimulus-control procedures designed to bring studying under self-control. First, the students were trained in the functional analysis of behavior. They were instructed to keep a daily record of the total amount of time spent in study for each course. Then the students were trained in the human engineering of their study environment. For example, they arranged for
studying and only studying to take place at their study desk; any other activity was to occur elsewhere. Such an arrangement permitted study behavior to come under the stimulus control of the study desk. The students met weekly with E in individual tutorial sessions of one-hour duration, at which time data records were analyzed and procedural changes were discussed. Whereas E was initially the consultant, over time S eventually became his own consultant.

The case studies reported by Goldiamond illustrate some of the operations involved in instructing students in the application of self-control procedures to their studying behavior. Due to the absence of data with which to judge the efficacy of this approach, however, these case reports are suggestive at best.

Since Fox's and Goldiamond's pioneering studies, a number of other attempts have been made to teach students to manage their studying behavior through the self-application of behavior modification procedures. In a particularly promising line of investigation, several studies have found that the act itself of self-observing and self-recording study behavior may function as an independent variable in affecting the very behavior that it is attempting to measure. Thus self-monitoring of study behavior may produce an increase in the amount of time spent studying. For instance, Johnson, Martin, and White (1970) found such reactive effects of self-monitoring on study behavior.

In another investigation of self-monitoring as an agent of behavioral change, Johnson and White (1971) examined the effects of self-observation by college students in a self-paced, mastery-graded introductory psychology course. A comparative group design was employed
in which the effects of self-recording on weekly course grades were assessed under three conditions: (a) self-observation of study behavior, (b) self-observation of dating behavior, as a control for the nonspecific effects of self-observation, and (c) no-contact control. Demand characteristics for behavior change were controlled for somewhat by informing Ss that the purpose of the investigation was to examine "student life." Students in the self-monitoring groups were trained to record and graph the frequencies of their respective target behaviors. As a means of facilitating the observation of study behavior, a point system for study output was implemented in which various study activities earned certain numbers of points. Experimental Ss summed and graphed both daily and weekly study time and point totals, and submitted these data each week on preaddressed postcards. Those Ss monitoring dating received similar instructions with respect to recording time spent in dating activities.

The data revealed that the study group received significantly higher course grades over a period of ten weeks than the no-contact control group. The differences between study and dating conditions, however, were not statistically significant. The investigators attributed this finding to the possibility that students self-recording their dating behavior may have become more aware of the time spent dating in relation to the time they should be spending in studying, and increased their study time accordingly. No data were reported in support of this speculation. In addition, study time showed moderate to high correlations with weekly course grades; dating time showed low and nonsignificant correlations with grades. Although the effects of
self-monitoring of study behavior on academic performance was demonstrated, no direct data were presented to indicate that self-monitoring either target behavior (i.e., studying or dating) actually increased performance of that behavior. Furthermore, the finding that self-monitoring of study behavior resulted in improved academic performance (as measured indirectly by grades in the course) was mitigated by the fact that the period (i.e., the sixth week) for comparing the experimental and control groups was selected arbitrarily. Moreover, direct group comparisons of the overall grades for the course were never entertained since fully 80 percent of the entire sample of students received A's. Thus the generality of these results was not established, inasmuch as a preponderance of students earned an A in the course and since the grades in other courses were not examined. Another methodological shortcoming of the study was that because grades were employed as a dependent measure, the reliability of Ss' self-monitoring of their studying behavior was not assessed at all.

Broden, Hall, and Mitts (1971), employing a single-subject reversal design, investigated the effects of self-monitoring on the in-class studying behavior of an eighth-grade girl who was failing in history. The student was instructed to self-record her study behavior in the classroom, defined as attending to teacher-assigned tasks, as well as her non-study behavior. Reliability checks between self-recordings of S and independent observations of an external observer yielded low levels of agreement between S's and observer's records of study behavior. In spite of the low correlation between S's self-recording of studying and
her actual studying, high study rates were achieved and maintained. This finding suggests that highly accurate and reliable self-recording may not be essential in effecting behavior change. The data also showed that studying behavior stabilized at 30% during baseline, rose to 78% during the self-recording period, declined to 27% during a return to baseline, increased to 80% during self-recording period, increased further to 88% during self-recording plus teacher praise, averaged 77% during praise only, and dropped slightly during another return to baseline conditions. Thus the application of self-recording procedures initiated and increased study behavior to a level at which the teacher was able to maintain it with attention, praise, grades, and other reinforcers naturally available in the classroom. In addition, there was some evidence that S's increased study time in class resulted in improved academic performance inasmuch as her report card grade in history rose from D- to C. In short, self-recording study behavior resulted in an improvement of academic performance in the absence of any scheduled consequences.

The value of this study arises from its single-subject methodology permitting experimental demonstration of the functional relationship between the systematic institution of planned interventions and S's studying behavior. The reversal design allowed experimental conclusions to be drawn regarding the specific effects of the treatment variables in controlling the target behavior. While the use of such methodology has its limitations, further research of this nature is called for if the operations of such variables as self-monitoring are to be elucidated. The study by Broden et al. is also significant as it
is one of the few reporting the implementation of behavioral self-control procedures with a junior-high school student.

In one of the first experimental investigations of the explicit use of self-control procedures for studying reported in the literature, Beneke and Harris (1972) instructed 38 college student-volunteers in self-control procedures for managing their study behavior. Training in effective study methods was carried out in two modes, with 30 students receiving instruction via twice-weekly group presentations and 8 students via written lessons. In both instances, Ss were exposed to the same content and material of the study program, which consisted of the following major components: First, students were instructed to monitor and record their study time, as a means of developing a greater awareness of their current study habits. Second, Ss were asked to draw up a list of personal reasons for studying and improving their study behavior, in an attempt to strengthen their commitment to change their study habits. Third, students were taught to bring their study behavior under stimulus control; they were encouraged to establish one place, or at most two places, at which to do all of their studying. Fourth, Ss were instructed to use powerful, immediate, and contingent reinforcers in order to strengthen study behavior. Fifth, Ss were introduced to punishment procedures for dealing with behavior incompatible with studying. In addition, Beneke and Harris' comprehensive treatment program included such study units as SQ3R, taking effective lecture notes, examination skills, and maintaining good study habits.

The results of this investigation showed that the program suffered a heavy mortality rate, with 15 (24%) of the original 53
volunteers attending only one meeting, and only nine Ss (17%) completing all 11 lessons. Excluding the 15 Ss who dropped out immediately, there were no differences in the mean number of lessons completed between those students attending group sessions and those working individually. In addition, neither treatment resulted in an increased amount of study time per day; the correlation between hours studied and lessons completed was not significant. On the most important measure of the effects of the program—changes in grades—Ss who completed 7-11 lessons exhibited significant gains in G.P.A. for the three semesters following the program over the two preceding semesters, as compared with Ss completing 1-6 lessons and dropout Ss. The correlation between G.P.A. gains and lessons completed was highly significant. Hence, those Ss who participated fully in the program showed more reliable G.P.A. gains than Ss who did not, and these gains lasted for at least two semesters.

It is noteworthy that the effect of the program on G.P.A. was not primarily due to its increasing study time. The authors pointed out that although some minimal study time appears necessary for making improvements in G.P.A., such gains seem to be due to increases in the quality rather than the quantity of study. In addition, since those Ss who simply received written lessons and implemented them on their own did as well as those who discussed the lessons in group meetings, the program appears especially promising for self-instructional use with large groups of students. However, as indicated by Beneke and Harris, the major problem with implementation of such program is that of inducing Ss to participate and keeping them motivated to do so. Apparently, the dissemination of knowledge regarding the self-application
of behavior modification procedures for improving studying did not provide sufficient incentive for most Ss to continue to participate.

Unfortunately, Beneke and Harris' study qualifies as a pseudo-experiment, inasmuch as Ss were not randomly assigned to experimental conditions. Early dropouts from the program were used as a control for any systematic changes in grading, as were University-wide G.P.A.s. Experimental Ss apparently were free to choose to attend either group meetings or to work on written lessons entirely on their own, and were assigned to treatment conditions accordingly. Notwithstanding this serious experimental shortcoming, the study represents a substantial methodological improvement over the usual anecdotal demonstrations in terms of (a) its relatively large S sample, (b) its assessment of long-term effectiveness, and (c) its detailed description of operational procedures for teaching self-control of study behavior. In addition, since all Ss recorded their study time on data sheets supplied by E, important data on study time were reported on the correlation between hours studied and lessons completed, and between study time and G.P.A. However, neither the reactivity nor the reliability of such self-recording of study time was assessed.

Jackson and Van Zoost (1972) attempted to change the study behaviors of college students through the application of reinforcement contingencies. The results demonstrated clearly that the use of self-reinforcement procedures can be equally as effective as external rewards in the improvement of study habits. These findings were strengthened further by the presentation of follow-up data which revealed a long-term superiority in the study behavior of self-reward
Ss, thereby suggesting the durability of the effectiveness of self-reinforcement. This study merits attention in that it was one of the few to conduct a long-term follow-up.

In a well-designed and well-controlled experiment by Allen (1973), the comparative effectiveness of group-administered and self-administered relaxation and study counseling on reducing test anxiety and increasing academic performance was evaluated. Eighty-four test-anxious undergraduates received treatment either in small groups or via self-instructional manuals. Treatment consisted of one of the following conditions: (a) group-administered study counseling and relaxation, (b) group-administered study counseling, (c) self-administered study counseling and relaxation, (d) self-administered study counseling, (e) group-administered "attention-focusing" placebo treatment, (f) testing control, and (g) minimal-contact control. Group treatment was conducted in small weekly groups of six Ss over a period of seven weeks, with a complete crossing of therapist and treatment factors.

Allen's study skills counseling package consisted of the following components presented within the context of group treatment. The rationale for teaching helpful study skills was explained in terms of equipping the student to deal more effectively with realistic academic problems and to study more efficiently in less time. In addition, test anxiety was viewed as a normal situational reaction which occurs when students perceive themselves as lacking the skills necessary for successful performance on exams. It was emphasized that personality and historical variables are not as important as the development of effective study skills and habits in determining academic
success in college. During the first session, discussion was devoted to methods for delineating the vague concept of "study" into objective, measurable terms. Participants were instructed to monitor their study behavior in order to determine the operant consequences of what they did, and were taught to perform functional analyses of their study behavior. The second session focused on a presentation of stimulus-control procedures based on the work of Fox (1962) and Goldiamond (1965). In the third session, the SQ3R method of study (Robinson, 1961) was taught, followed by a specification of helpful techniques for "playing the college game" and for studying for exams. Session six centered on the use of "response management techniques" (Premack, 1959) and in particular the application of short- and long-term reinforcement to shape study efficiency. The seventh session reviewed the specific study procedures covered in previous sessions. Participants were encouraged to verbalize principles which they used, and to apply the procedures in the alleviation of future problems in studying. Furthermore, all participants were given weekly homework assignments to perform.

Allen's self-administered treatment package contained programmed instruction comprised of essentially the same content as that offered as part of study counseling in groups. In addition, the self-instructional study manual included a check-list of procedures for participants to use during the week, along with forms for implementing these procedures on a daily basis. Participants were instructed to adapt the major principles detailed in the weekly lessons into a workable technique and to try out the technique during the week.
Data on self-reported anxiety and academic performance, collected before and after therapy, showed that both study counseling alone and study counseling plus relaxation were (a) equally effective in reducing anxiety and improving grades and (b) significantly better than no treatment. In addition, the method of administration of treatment—whether group-administered or self-administered—made no difference; thus all four study-related treatments yielded reductions in test anxiety and increases in examination performance that were equally reliable with respect to one another, but significantly greater than no treatment. The treatment groups evidenced significant G.P.A. gains in coursework over both placebo and no-treatment conditions, though no differences were found between treatment and placebo on test-anxiety reduction and exam-score improvement.

Additional findings were that a greater proportion of those Ss receiving self-instructional manuals (41%) versus those Ss meeting in small groups (29%) failed to complete treatment. The authors suggested that given the higher attrition rates associated with the self-administered conditions, interspersing study material presented via manuals with weekly group sessions may afford the most effective treatment for test anxiety. Another interesting result was that virtually all Ss who received both relaxation and study counseling credited the latter as being more helpful in enhancing academic performance. The apparently greater potency of study counseling is further supported by the finding that the addition of relaxation to study counseling did not significantly increase academic performance.

Allen's study is an exemplary piece of research in terms of
(a) his inclusion of appropriate control and placebo groups, (b) his use of multiple therapists along with a complete factorial crossing of therapists and treatments, and (c) his detailed description of treatment procedures and operations. His investigation is weakened by the absence of any data on reported study time, an especially appropriate dependent measure for the study counseling treatments which included self-monitoring, stimulus control, and reinforcement procedures for improving study behavior. Allen's findings and conclusions also might have been strengthened through the inclusion of follow-up data on the long-range effectiveness of intervention.

Recently, a method of self-control that has received considerable research attention is contingency contracting. As first described by Homme, Csanyi, Gonzales, and Recks (1969), contingency contracting is a self-reinforcement procedure involving the individual's specification of a behavioral task for himself and arrangement of self-reinforcement contingent upon completion of the task. Together, the specified behavioral task and the predetermined contingent reward define the content of the self-contract.

Numerous case examples of the application of contingency contracting along with other self-control procedures have been provided by Watson and Tharp (1972), who instructed college students how to design and implement self-modification programs for a variety of problem behaviors, including studying. Students were taught as part of a course in adjustment to engage in the following steps leading to the development of self-control: (a) specifying in objective terms the behavior to be changed; (b) recording the frequency of occurrence of
the behavior to be controlled; (c) conducting a behavioral analysis of
the antecedent and consequent events influencing the target behavior;
and (d) drawing up a contingency self-contract, consisting of a written
statement of behavioral goals, shaping steps, and self-rewards.

Since Watson and Tharp's (1972) work is mainly an instructional,
do-it-yourself book on how to engage in self-directed behavior change,
it offers an exceptionally clear specification of a variety of self­
control procedures. It does not provide, however, systematic data on
the effectiveness of its self-control methods. What data are included
are presented in the form of single case reports to illustrate the
application of various self-modification techniques. These self-reported
case studies showed that as a result of following the guidelines for
the establishment of self-modification programs--the majority of which
focused on study and academic performance as the target of intervention--
desired behavior changes occurred. Unfortunately, as informative as these
single case studies were, they provided no evidence as to whether or
not the self-control procedures employed were in fact responsible for
the observed behavior changes. In addition, since the self-modification
program was comprised of a combination of self-control techniques, it
was not possible to assess the relative contribution of each of these
procedures in producing change. Furthermore, since all of the data
presented were based on self-reports submitted to a professor in
fulfillment of a course requirement, the reliability of the data is
open to question.

Although contingency self-contracting holds promise as one of
the most well-defined and specifiable of self-control operations, there
have been few controlled investigations of its effects. Consistent with
the need for experimental investigation of self-control procedures in
general and self-contracting in particular, a number of empirical studies
have been conducted comparing self-contracting for study behavior with
other methods of study improvement.

Several studies have been reported in which contingency
contracting has been effectively self-implemented by college undergraduates
as a means of improving their study output and academic performance.
For example, S. Moffat (1972) and J. Moffat (1972), within similar lines
of investigation, demonstrated the successful application of activity
and money reinforcers in increasing both study time and test scores of
college underachievers within a contingency contracting framework.

In one of the few controlled investigations of the explicit
application of self-control techniques to studying, McReynolds and Church
(1973) compared contingency self-contracting, study skills development,
study counseling, and no treatment in the improvement of the study
behavior of 39 college underachievers. The self-contracting treatment
involved three main operations, including (a) detailed explanation of
the logical and empirical foundations of self-contracting, (b) evaluation
of study time usage during the week and work efficiency during study
periods, and (c) instruction and supervision in drawing up and implementing
self-contracts. All self-contracts consisted of the specification of
required study behaviors, the determination of preferred goods, services,
and activities serving as reinforcers, and the implementation of self-
reinforcement contingent on performance of study behavior. Three
classes of reinforcement were included in the contracts: mini-reinforcers (i.e., brief rest breaks or small luxuries), midi-reinforcers (i.e., end of the day rewards of moderate desirability), and maxi-reinforcers (i.e., weekend reinforcers of sizeable magnitude). Seven study contracts were made by each S over a treatment period of ten weeks. Contracts encompassed 2-4 days at a time, and called for the systematic shaping of daily study time--from initial contracts of 10 minutes of study per day to subsequent contracts of 2-6 hours of daily study. Ss in the self-contracting regimen met with a study counselor (i.e., a graduate student in clinical psychology) twice weekly for five individual and five group sessions. In addition to self-contracting operations, Ss in this treatment program received general study suggestions taken from Robinson's (1961) effective study training methods.

The results of the study indicated no differences at pre- and post-treatment among groups in G.P.A. in coursework. However, a comparison of the number of Ss in each condition completing less than ten course credits following treatment showed that significantly more Ss in the no-treatment group fell below ten credits than in the contingency self-contracting and study skills development groups. Similarly, these two treatment conditions displayed significant pre-post changes in grade points earned in relation to no treatment. These results were interpreted as providing some support for the effectiveness of self-contracting. In their discussion, Reynolds and Church suggested that stronger experimental support for self-contracting might result with academic underachievers whose main problem relates to an inadequate study effort. As it was, Ss in the current study evidenced not so much a deficit in study time as a deficit in study skills; hence the focus
on increasing study time instead of study skills appeared inappropriate for these Ss. Another important finding was that approximately 40 percent of all self-contracts were broken in that reinforcement was not delivered or withheld, as contractually stipulated. The investigators suggested the desirability of incorporating external contingencies within self-control manipulations as an alternative to complete reliance on Ss' cooperation in maintaining self-control operations.

Although treatment focused generally on effective study time usage and specifically on increasing study time, no data were included on the studying behavior of Ss. Also, the specific self-control operations implemented by the self-contracting group were only minimally spelled out and described. It is noteworthy that some important data were presented documenting the extent to which Ss honored or reneged on their contingency self-contracts.

Bristol and Sloane (1974) also instructed college students in the use of contingency contracting on study behavior, although none of their procedures were conceptualized and implemented explicitly within the framework of behavioral self-control. The effects of contingency contracting, as well as the effects of self-monitoring alone, on study rate and test performance were systematically assessed. The relationship between study time and subsequent test performance was also assessed, along with the effect that contracting for increased study in one course had on study rate in another course. Thirty-six undergraduate students enrolled in an introductory psychology course were randomly assigned to three conditions—(a) no-treatment control, (b) self-monitoring control, and (c) contingency contracting. This group design permitted an
evaluation of the overall impact of the contingency contracting program, by comparing course grades earned by the experimental group with those earned by the two matched control groups. The effects of contracting in producing increased study rate were assessed by the use of a single-subject reversal design for each S in the experimental group. Students in this condition implemented a series of weekly contracts, as part of a program which called for (a) studying introductory psychology for a gradually increasing amount of time as specified by "task cards" issued to them periodically, (b) recording and graphing their daily study time, (c) recording daily the amount of time spent studying in a second course, selected as most equivalent in difficulty to introductory psychology, (d) meeting weekly with E, and (e) receiving a monetary reward from E for studying introductory psychology in the amounts specified. In addition to the use of money as a reinforcer, the social reinforcement of E was scheduled for meeting the weekly response criterion and for turning in study time data.

The results of the study indicated no significant differences between treatment conditions in test performance in the course. However, separate analyses of the better and poorer students in each group showed that the contracting procedure was selectively effective with below-average students, who improved significantly with each successive test, while the other groups evidenced no change. Self-monitoring of studying in the absence of any contingencies gave rise to no improvement in course grades. In terms of study rate, the contracting group increased its study time markedly more than the control group, which merely
recorded and graphed study time throughout the program. Moreover, the reversal procedure established that contingency contracting resulted in significant increases in the study rate of almost every student in the experimental condition. The reliability and representativeness of study time data were established in two study settings via external observers. Study rate gains in the contracted course did not generalize to noncontracted courses. Finally, irrespective of the presence or absence of scheduled differential consequences, the correlation between study time and course grades was only moderate.

Bristol and Sloane's study is noteworthy for its experimental design which combined both single-subject (i.e., reversal) and group methodologies in assessing the effects of contingency contracting. Moreover, this investigation was one of the few that separated and evaluated the effects of self-monitoring of study behavior. It was also one of the first to report extensive data on study time throughout the program, employing minutes per day as well as percentage of no-study days as outcome measures. Furthermore, the relationship between study rate and subsequent test performance was carefully assessed. These data were marred, however, by the use of inadequate procedures for obtaining reliability checks of self-reported study data.

More recently, in a test of the application of self-control in the natural environment, Green (1974) trained students in the self-modification of appropriate academic behavior. While contingency contracting again constituted one of the central features of the treatment program, in this study it was conceptualized and implemented explicitly as a self-control technique. This investigation was designed
specifically to assess the differential effectiveness of self-monitoring and self-reinforcement when used in naturalistic settings, as well as the reliability of self-monitoring. The study employed a single-subject, multiple baseline design with a no-treatment control group, using as Ss eight experimental and eight matched control undergraduates in two separate classes for students with reading deficiencies. The academic behaviors of class attendance, punctuality, completion of assignments, and studying in the study center were monitored and recorded throughout the study for both groups. In accordance with a multiple baseline design, each experimental S self-monitored all four academic behaviors, and sequentially included each academic behavior in turn within contingency self-contracts, which employed high-frequency behaviors as reinforcers. These self-control procedures required experimental Ss to engage in complete self-assessment of performance as well as self-determination and self-administration of reinforcement; all of these self-control operations were embedded explicitly within each experimental S's behavioral self-contract.

The findings of the study indicated that though self-monitoring was effective in producing a higher rate of academic behavior, the combined procedure of self-monitoring and self-reinforcement was more effective than self-monitoring alone in improving academic performance. The effects of self-monitoring on academic behavior showed marked variability both across and within Ss. In addition, the results showed that experimental Ss were able to self-monitor their academic behaviors reliably, and to maintain self-control strategies simultaneously in the natural environment.
Although Green conceptualized his study as a test of self-control in the natural environment, the effects of contingency contracting were assessed only in the context of studying in a study center. Students' studying on their own outside of the study center was neither targeted nor measured; furthermore, no attempt was made to assess the generalization of self-modification methods to courses and settings outside of the target classroom and study center. Accordingly, the generality of Green's findings regarding the effects of self-contracting on study behavior appears to be restricted to settings utilizing such study centers.

**Summary and Conclusions.** In summary, the research of the use of behavioral self-control in the improvement of studying and academic performance has been marred by a number of experimental shortcomings. Specifically, the investigations reviewed herein have been characterized by many of the following features: (a) use of college students as Ss (e.g., all previously cited studies with the exception of Broden et al., 1971); (b) emphasis on single-subject case reports and involvement of relatively small numbers of Ss (e.g., Broden et al., 1971; Fox, 1962; Goldiamond, 1965; Watson & Tharp, 1972); (c) lack of appropriate placebo and control groups for demonstrating that treatment effects are attributable to specific planned interventions (e.g., Beneke & Harris, 1972); (d) presentation of inadequate outcome data, particularly in regard to the failure to use reported study time as a performance measure (e.g., Allen, 1973; Fox, 1962; Goldiamond, 1965; McReynolds & Church, 1973); (e) failure to partial out and control for the effects
of self-monitoring of behavior (i.e., studying) when included as a part of treatment (e.g., Beneke & Harris, 1972); (f) inadequate assessment of the reliability of self-reported data (e.g., Beneke & Harris, 1972; Johnson & White, 1971; Watson & Tharp, 1972); (g) imprecise specification of self-control operations (e.g., McReynolds & Church, 1973); (h) insufficient documentation of the reliability of treatment operations (e.g., all previously cited studies with the exception of Green, 1974; McReynolds & Church, 1973); (i) failure to identify and separate the effects of the individual self-control procedures comprising treatment (e.g., all previously cited studies with the exception of Broden et al., 1971); and (j) lack of follow-up regarding the long-term effectiveness of intervention in general and the generalization of self-control behaviors in particular (e.g., all previously cited studies with the exception of Beneke & Harris, 1972; Bristol & Sloane, 1974; Jackson & Van Zoost, 1972).

As a result, the findings and conclusions of most of the reviewed studies appear to be attenuated by methodological confounding. Clearly, research in behavioral self-control of studying needs to pay closer attention to basic considerations of sound experimental design and methodology. In particular, further research in study improvement needs to include experimental procedures for reducing and eliminating the major threats to the reliability or internal validity of experimentation in this domain.

A well-controlled, experimental investigation in this area should meet, as a minimum requirement, the following criteria: (a) inclusion of appropriate control groups, including placebo and self-monitoring controls; (b) use of multiple dependent measures drawn from both self-report
(i.e., study time) and performance (i.e., course grades) domains; (c) systematic assessment of the reliability of self-reported data; (d) precise specification of the content and procedures involved in each form of treatment; and (e) careful documentation of the reliability of self-control operations.

In conclusion, although many of the reviewed studies are lacking in these basic experimental requirements, the literature to date in the behavioral self-control of studying stands on its own. Based on the results of some of the more methodologically sophisticated studies in this area (e.g., Allen, 1973; Bristol & Sloane, 1974; Green, 1974), the utility of the application of self-modification procedures to study behavior appears sufficiently promising to warrant continued investigation. Taken as a whole, the research in this domain has demonstrated clearly that the extension of self-control methods to the improvement of study and academic performance has considerable promise.
CHAPTER IV
BEHAVIORAL TREATMENT OF ACADEMIC UNDERACHIEVEMENT

This chapter reviews and integrates a supporting line of research which has particular relevance to the development of a behavioral intervention model for the self-control of studying: the application of behavioral treatment to study and academic performance. The literature in this research area is surveyed with the purpose of extracting the pertinent experimental findings relating to the present endeavor.

Academic Underachievement as a Focus of Behavioral Intervention

The educational and counseling literature is replete with investigations of counseling and therapy approaches to the prevention and treatment of academic underachievement. In general, these studies have employed one of two contrasting intervention strategies for helping the underachieving student: (a) those which have focused on the underlying personality dynamics of underachievement such as self-concept, achievement motivation, and social adjustment; and (b) those which have dealt with the concomitant behavioral factors related to academic underachievement such as study habits, reading skills, curriculum choice, and work scheduling.

Investigations taking the first approach have attacked the underlying personality dynamics of academic underachievement, neglecting what are presumed to be the symptomatic problem behaviors related to underachievement. These traditional approaches--involving either group
or individual counseling--to the treatment of academic problems, however, have not met with notable success.

In an important review of traditional group counseling approaches to the treatment of academic difficulties in college, Chestnut (1965) reported that only two (Hart, 1963; Spielberger & Weitz, 1964) of 15 studies demonstrated a relationship between counseling and improvement in academic performance. Hart (1963) examined the effects of two types of group experiences on the academic achievement of college underachievers. The results of his study clearly indicated that group counseling can facilitate academic achievement. Spielberger and Weitz (1964) employed a group study counseling approach to the prevention of academic underachievement. As a result of group treatment consisting of re-educative counseling alone, test-anxious college freshmen showed a significant improvement in academic performance in terms of G.P.A. in coursework.

In contrast, investigations taking the second approach have emphasized the appropriateness of intervention with those problematic study behaviors presumed to be directly related to academic underachievement. In fact, studies employing a behavioral view of academic underachievement have regarded poor study behavior not as a symptom of underachievement but as a problem in its own right deserving of direct treatment. Recently, there have been a growing number of research studies which have employed a behavioral intervention approach to the modification of ineffective study habits and poor academic performance.

Unfortunately, there have been few experimental studies
comparing the relative effectiveness of behavioral counseling and traditional counseling approaches in the improvement of academic performance. In one of the few investigations of its kind, Doctor, Aponte, Burry, and Welch (1970) compared the efficacy of behavior therapy versus group counseling in the treatment of college underachievement. The major features of the behavioral approach included (a) the analysis of the role of maladaptive study and test anxiety, (b) relaxation training, (c) hierarchy construction, (d) systematic desensitization, and (e) suggestions for improving study methods. The emphasis in the group counseling approach was on discussion of the student's attitudes and feelings about his studying and academic performance, coupled with advice for improvement of study and test-taking habits. Both forms of treatment resulted in significant gains in grades as compared with control groups of no-treatment volunteers and no-treatment non-volunteers, who exhibited grade decrements. Moreover, the data indicated that both treatment approaches were beneficial to virtually all participants; thus the results were not due to dramatic improvement in grades by only a few Ss. There were no significant differences in G.P.A. changes between behavior therapy and traditional counseling groups. However, qualitative differences between the two groups in paper-and-pencil measures suggested that each form of treatment produced specific and unique changes in behavior, which in turn resulted in grade improvements. One of the study's major findings was that academic underachievement is amenable to treatment by behavioral and group methods. This represented a striking finding in light of Chestnut's (1965) previously cited review reporting only two of
15 investigations of group counseling with underachievers evidencing demonstrable improvements in academic performance.

Behavioral Treatment of Academic Underachievement: A Review

Within the last decade, there has been a deluge of investigations attempting to extend the use of a behavioral model of intervention to an increasingly wide range of human problems. One of the major thrusts of this research has been the application of behavioral procedures to the amelioration of problematic student behaviors in educational settings. Among the variety of academic-related behaviors which have served as the focus of experimental investigations, studying stands out as an especially important target of behavioral intervention efforts.

There is currently a burgeoning literature in the application of behavioral intervention to study behavior. The research investigations in this domain may be categorized into those focusing on (a) studying inside the classroom and (b) studying outside the classroom.

The large majority of investigations of behavioral intervention with studying have been conducted within the immediate confines of the classroom. As a whole, these studies have demonstrated the effectiveness of a variety of behavioral techniques in increasing study behavior and academic performance in the classroom (e.g., Bushell, Wrobel, & Michaelis, 1968; Hall, Lund, & Jackson, 1968; Lovitt & Curtiss, 1969). In a review of the literature on the application of behavioral principles in the classroom, Sloggett (1972) listed approximately three dozen investigations in which in-class studying behavior constituted the target behavior of
intervention efforts. Certainly, as attested by these studies, there has been no shortage of research effort devoted to the improvement of study behavior within the classroom setting.

In addition, there have been a number of exploratory attempts to employ behavioral procedures outside the classroom in the development and maintenance of effective study skills and methods. Generally, these investigations have sought to instruct students studying on their own in the application of sound study methods, the acquisition of effective study skills, and the maintenance of efficient study habits. Additionally, in most of the studies in this area, intervention typically has taken place in the context of counseling and therapy groups.

The present section offers a general survey of the targeting of outside-class study behavior for behavioral intervention. Research in the behavioral treatment of study and academic problems has included three forms of intervention: (a) study-improvement counseling, (b) systematic desensitization, and (c) study-improvement counseling and systematic desensitization, combined.

Study-Improvement Counseling

In an early illustration of a behavioral approach to the treatment of academic underachievement, Miller (1964) presented a case study of the simple application of reinforcement in controlling the study behavior of a high school student. Systematic rewards in the form of food were made contingent upon studying flash cards in three
courses. The contingent use of such extrinsic reinforcement resulted in a dramatic improvement in grades during the intervention semester (B-), as compared with semester grades immediately before (D) and after (D) intervention. While the experimental procedure resulted in substantial improvement in S's studying and subsequent grades, there is some question as to which aspects of the total treatment produced the observed effects.

In addition, a series of investigations have reported the modification of poor study habits through the application of a variety of behaviorally-oriented procedures, such as structuring of goals, commitment to goal attainment, programming of reinforcement from others, and self-reinforcement (Fuhriman, 1969; Hoopes, 1969; Hoopes & Scoresby, 1969; Scoresby, 1969). As a group, these studies presented a behavioral counseling approach geared to the low-achieving high school or college student. Intervention was offered in the context of a one-to-one relationship between client and counselor, and was structured to help students implement more successful academic behavior, overcome the habit of procrastination, and learn the study habits necessary for successful academic achievement. The specific elements in this approach included (a) helping the student to structure behavioral subgoals leading to the accomplishment of a major goal, (b) obtaining from the student a personal commitment to goal attainment, (c) implementing specific action steps designed to accomplish his goals, and (d) arranging for reinforcement to follow progress toward his goals. It is noteworthy that a major emphasis in this approach included instructing the student to reward himself, as well as solicit the reinforcement of
others, for each successful step in fulfillment of his goals. Unfortunately, only anecdotal data were presented by these studies in support of the behavioral methods described.

Jones (1969) developed some behavioral group procedures for helping college students who wanted to improve their study behaviors and academic performance. Besides receiving training in basic study skills, 64 Ss were exposed to one of three treatment conditions: (a) model reinforcement group counseling, (b) desensitization group counseling, and (c) unstructured group centered counseling. Group counselors were crossed completely with group approaches, with treatment occurring in weekly small-group sessions over a period of seven weeks.

No conclusions, however, could be drawn regarding the relative effectiveness of these experimental group procedures for improving students' performance of study behaviors, as inadequate data were collected. The two criterion measures employed as indices of behavior change--surveys of study habits and self-reports of daily frequency of various study behaviors--yielded insufficient data to be analyzed. Anecdotal information was presented in showing the promise of these group-treatment approaches, especially the social modeling and desensitization procedures. The author concluded that this pilot study was successful in providing important information on the development and feasibility of these behavioral group treatments.

**Systematic Desensitization**

The bulk of research using behavioral procedures in the improvement of academic performance has consisted of applications of
systematic desensitization to the treatment of test anxiety. Since 1966, there have been more than two dozen investigations appearing in the literature of the use of various forms (e.g., individual, group, self-administered, automated, massed, marathon) of desensitization in the treatment of test-anxious students. With the exception of two studies which used high school students as Ss (Kondas, 1967; Mann & Rosenthal, 1969), all of the research investigations in this genre have drawn its Ss from the college population (Allen, 1971; Cohen, 1969; Crighton & Jehu, 1969; Doctor, Aponte, Burry, & Welch, 1970; Donner & Guerney, 1969; Emery & Krumboltz, 1967; Freeling & Shemberg, 1970; Garlington & Cotler, 1968; Ihli & Garlington, 1969; Johnson, 1966; Katahn, Stronger, & Cherry, 1966; McManus, 1971; Mitchell & Ingham, 1970; Paul & Shannon, 1966; Prochaska, 1971; Suinn, 1968).

A majority of these studies, however, suffered from serious methodological confoundings which attenuated the strength of the conclusions drawn. Some of the major limitations of these studies include (a) the use of only one therapist (e.g., Donner & Guerney, 1969; Ihli & Garlington, 1969; Katahn et al., 1966; Paul, 1964), (b) failure to cross completely treatments and therapists (e.g., Doctor et al., 1970), and (c) lack of appropriate control groups (e.g., Crighton & Jehu, 1969; Garlington & Cotler, 1968; Ihli & Garlington, 1969; Suinn, 1969). As a result of these methodological shortcomings, the studies cited above provide tenuous support for the effectiveness of systematic desensitization in the alleviation of test anxiety (Allen, 1971). Critical reviews of the literature in this area may be found in Paul (1969) and Allen (1972).
Study-Improvement Counseling and Systematic Desensitization

Some of the studies previously cited employed behavioral treatment consisting of a combination of systematic desensitization and study-improvement counseling. Due to their inclusion of instruction in effective study methods and their focus on improvement in academic achievement, these investigations warrant further discussion under the present rubric.

A couple of early studies have reported that the therapeutic application of a combination of group re-educative counseling in conjunction with systematic desensitization resulted in significant improvement in G.P.A. of test-anxious college students, as compared with controls (Katahn et al., 1966; Paul & Shannon, 1966).

McManus (1971) reported a combined systematic desensitization and study counseling program for the group treatment of 18 undergraduates with test-taking anxiety. The sole dependent measure was pre- and post-program G.P.A. in course-work. Treatment consisted of seven weekly sessions of desensitization and counseling, with the latter component of the program involving exchange of ideas on effective and ineffective study habits and attitudes. In addition to general counseling discussion, specific alternatives with which to replace ineffective study approaches were suggested. The results indicated that the desensitization and counseling procedure was successful in improving the academic performance of treated Ss, who displayed a statistically significant increase in G.P.A. as compared with a nontreated wait-list control group.

These findings of the benefits of counseling combined with
desensitization are consistent with those reported earlier (Katahn et al., 1966; Paul & Shannon, 1966). McManus speculated that in addition to providing social reinforcement and support, counseling discussions influenced cognitions that mediated and facilitated behavior change. The counseling discussions apparently afforded a medium for students to observe increasingly fearless peer-models, and to learn adaptive study attitudes and skills as a substitute for anxiety responses.

A few investigations have separated and compared the effects of systematic desensitization and study-improvement counseling in the treatment of test anxiety and academic underachievement. In an important study by Allen (1971), the comparative effectiveness of systematic desensitization and study counseling was assessed in reducing test anxiety and increasing academic performance of test-anxious college students. Seventy-five volunteers were assigned randomly to one of four treatment conditions and one of two controls, as follows: (a) desensitization alone, consisting of training in relaxation to a hierarchy of study and exam situations; (b) study counseling alone, designed to improve study efficiency through the application of operant methods; (c) a combination of desensitization and study counseling, which integrated the essential features of both procedures; (d) placebo treatment consisting of attention-focusing as a control for nonspecific group interaction and therapist-attention effects; (e) testing control, wherein the effects of repeated administration of anxiety measures were assessed; and (f) minimal-contact control, which served as a control for the effects of minimal contact and passage of time. Two therapists who were crossed with treatments provided seven
weekly sessions of treatment.

The experimental design of the study was a repeated measures paradigm involving pre- and posttreatment assessment of self-report, physiological, and performance variables. Data on these variables were collected during an initial screening interview, immediately before midterm and final examinations, and during the final therapy session. The results indicated that a combination of desensitization and study counseling was superior to either procedure alone in reducing physiologically-measured test anxiety and in improving academic performance. Desensitization and study counseling were not reliably different from each other, nor reliably more effective than placebo treatment in improving academic performance. Specifically, Ss in desensitization, study counseling, combination, and placebo groups showed mean G.P.A. (A=5, B=4, C=3, etc.) changes from pre- to posttreatment of -.03, .23, .40, and .32, respectively, with improvement significant for the latter two conditions; while Ss in testing control and minimal-contact control evidenced mean decrements of -.05 and -.15. Due to the unexpected therapeutic efficacy of nonspecific factors, the authors concluded that group interaction and therapist attention have potentially powerful influence on generating positive expectancies and enhancing examination behavior of test-anxious Ss.

In a long-term follow-up to Allen's (1971) study, Allen and Desaulniers (1974) examined the stability of treatment effects of study counseling and desensitization in alleviating test anxiety two years following termination of treatment. Follow-up questionnaire evaluations were obtained from 69 percent of the original Ss; grades subsequent to
the program also were collected for all of the original sample. Respondents who had been assigned to active treatment conditions (including placebo) maintained positive attitudes toward their respective treatments. A significantly larger proportion of Ss in the treatment groups exhibited individually significant improvement in grades during the first semester after program participation. Both treatment and control groups, however, showed significant anxiety reduction and grade improvement by semester of graduation, obscuring original treatment effects. These findings did not provide support for the efficacy of therapeutic intervention over an extended period of time for test anxiety and academic difficulty. Since grades for all groups increased over time, the investigators speculated that the deleterious effects of test anxiety may have been alleviated over time by entry into courses without formal test evaluations and by easing of general grading standards in recent years.

It is important to note that in their retrospective evaluations, Ss in the study counseling and combination treatments named and credited, as most effective, stimulus-control procedures along with suggestions for efficient management of study time.

In spite of the design problems inherent in many studies of the behavioral treatment of test anxiety, a number of conclusions can be drawn regarding the effectiveness of behavioral procedures with test-anxious students. Although systematic desensitization appeared effective in reducing test anxiety, at least when self-reported anxiety measures were employed as outcome criteria, the effects of desensitization on academic performance are more complex. In a review of research dealing
with the behavioral treatment of test-anxious college students, Allen (1972) found that improved academic performance was reported in five of eight investigations, with four of these studies (Allen, 1971; Doctor et al., 1970; Donner & Guerney, 1969; McManus, 1971) combining both desensitization and study counseling procedures. Moreover, data from several studies with placebo controls indicate that only a combined treatment package which includes desensitization and study counseling is reliably more effective than placebo treatment (Allen, 1971; Paul & Shannon, 1966). Apparently, the use of desensitization to reduce test anxiety and remove avoidance of study and exam situations in itself does not provide students with the skills necessary for improving academic performance.

In short, the available literature in the behavioral treatment of test anxiety generally supports the contention that a combination of systematic desensitization and study counseling promotes greater academic performance for test-anxious students than either procedure alone.

It is interesting to note that although a number of recent studies have indicated that a combination of desensitization and study counseling is the most effective treatment for test anxiety (Allen, 1971; Doctor et al., 1970; Katahn et al., 1966; Paul & Shannon, 1966), these same studies have cited study skills counseling as the most potent ingredient of the two. Retrospective reports of Ss in a follow-up study credited study-improvement methods as most beneficial (Allen & Desaulniers, 1974). Additional support for the efficacy of study skills training has been provided by Beneke and Harris (1972), who produced significant academic improvement through application of a study skills
program with neither desensitization nor relaxation components.

It may well be, as Allen (1972) has speculated, that systematic desensitization is the treatment of choice for students with good study habits whose negative emotional reactions are conditioned to examination situations and eventually to all study-related situations. On the other hand, study counseling may be most effective for students whose anxiety is a reactive result of maladaptive study skills and poor study habits. Further research relating the differential effectiveness of these two approaches to subject characteristics is needed to clarify this point. Such a logical extension of current research could result in an empirically-derived matrix of treatments and client characteristics that could lead to more efficient treatment and improved therapeutic outcome.

**Summary and Conclusions**

Up to the present time, the application of behavioral intervention to study and academic problems has consisted of three major approaches. The first treatment approach to academic improvement has employed the strategy of enhancing academic performance via behavioral study counseling. These investigations have taken a directive, behaviorally-oriented approach to study counseling with individuals in groups. They have instructed students to alter maladaptive study habits and methods through a variety of behavior modification procedures such as specification of goals in behavioral terms, functional analysis of behavior, stimulus control, shaping, contingency contracting, and reinforcement. Results of this approach to study and academic improvement thus far have been ambivalent, with many studies of this genre presenting
inadequate data and lacking appropriate controls.

The second treatment approach, employed by the large majority of research investigations in this area, has been based on the strategy of improving academic performance through the systematic desensitization of test anxiety. A multitude of such studies have been reported in which various forms of desensitization have been applied successfully in the treatment of test-anxious students. These studies, however, have been beset with a host of experimental deficiencies, including inadequate controls, use of a single therapist, and failure to cross treatments and therapists. Due to these methodological limitations, it was concluded that the efficacy of systematic desensitization in reducing test anxiety has received tenuous empirical support at present (Allen, 1972; Paul, 1969).

The third treatment approach, characterizing a growing number of research studies, has taken the strategy of combining systematic desensitization and behavioral study counseling in the improvement of academic performance. This line of investigation has demonstrated that a combined treatment package of desensitization and study counseling is generally more effective than either procedure alone in reducing test anxiety and increasing academic performance (Allen, 1971). It may be, however, that study-improvement counseling and systematic desensitization are differentially effective with students whose poor academic performance is related to (a) maladaptive study habits and (b) deleterious study anxiety.

Taken collectively, the research in the behavioral treatment of study and academic difficulties has been characterized by the following
limitations. Virtually all of these studies have focused on college students as the target population, with only a handful (e.g., Kondas, 1967; Mann & Rosenthal, 1969; Miller, 1964) targeting intermediate and high school students for intervention. Furthermore, a number of studies merely have presented descriptions of behavioral treatment procedures along with anecdotal findings but no actual data (e.g., Fuhriman, 1969; Hoopes, 1969; Hoopes & Scoresby, 1969; Jones, 1969; Scoresby, 1969). Also, previous attempts to improve the study habits of students generally have involved relatively small numbers of Ss (e.g., Doctor et al., 1970); indeed, many of these investigations have consisted of individual case reports and anecdotes (e.g., Miller, 1964). Where investigations in this area have taken the form of experiments involving large numbers of Ss, such studies have been plagued with methodological deficiencies. A major limitation of these investigations has been their lack of generality due to their brief follow-up, usually involving only the grades at the end of the term during which treatment occurred. In addition, a number of studies treating college students with academic difficulties have been confounded in that comparisons were made between presumably more motivated volunteers and less motivated nonvolunteer Ss (e.g., Cohen, 1969; Crighton & Jehu, 1970; Doctor et al., 1970; Suinn, 1968).

In conclusion, research in the behavioral treatment of academic underachievement remains at an early stage of development. The investigations reviewed herein have been generally lacking in experimental rigor and methodological sophistication. The inclusion of adequate controls,
particularly placebo procedures, has been glaringly absent in the research in this area. As a result, the efficacy of the use of behavioral intervention methods in the improvement of study and academic performance remains to be demonstrated.
CHAPTER V

SELF-ADMINISTERED TREATMENT BY BIBLIOTHERAPY

Another supporting line of research with especial relevance to the behavioral self-control of studying is the self-administration of treatment via bibliotherapy. Bibliotherapy, the literal meaning of which is "book therapy," consists of the prescriptive use of reading material as an integral part of the therapeutic endeavor. Such written, instructional material is designed expressly as a means of providing the client with a re-educative or therapeutic experience. To the extent that the explicit use of written instructions constitutes a pervasive part of the treatment program, such bibliotherapy represents a form of self-administered treatment. The present chapter examines the use of bibliotherapy as a treatment modality, and reviews some of the behavioral attempts to employ self-administered treatment by bibliotherapy.

Use of Bibliotherapy as a Treatment Modality

Recently, there has been a growing emphasis on therapeutic intervention with minimal involvement of trained professionals (e.g., Bandura & Menlove, 1968; Cassell, 1965; Gilbert & Ewing, 1965; Hogan & Kirchner, 1968; Kahn & Baker, 1968; Lang, 1966, 1968; Melamed & Lang, 1967). This recent movement has generated considerable theoretical interest and has substantial practical significance. Unfortunately, there has been a sparsity of evaluative data bearing on (a) the importance of the personal relationship and (b) the effectiveness of
written materials in producing change.

The personal relationship between client and counselor has long been regarded as the cornerstone of the therapeutic process; furthermore, the helping relationship has frequently been considered the single most critical, indeed indispensable, factor in counseling and therapy (Brammer & Shostrom, 1960). Notwithstanding the importance traditionally assigned to the role of the personal relationship, the issue remains at present an empirical question. Recent investigation designed to provide data regarding the validity of this traditional assumption has failed to affirm that the personal relationship plays a major role in the treatment of such diverse problems as academic underachievement (e.g., Gilbert & Ewing, 1965), test anxiety (e.g., Allen, 1973), obesity (e.g., Hagen, 1974), smoking (e.g., Young, 1973), and phobias (e.g., Hogan & Kirchner, 1968; Kahn & Baker, 1968; Melamed & Lang, 1967).

It follows that if face-to-face client-counselor contact is not absolutely essential, treatment via written materials may represent an economical, inexpensive, and widely available mode of treatment. Although bibliotherapy has been regarded as ineffective and useless in producing behavior change by some (e.g., Brammer & Shostrom, 1960), and even as potentially harmful and dangerous by others (e.g., Brower, 1952), there is a paucity of experimental data with which to validate such assertions. On the other hand, what experimental evidence is available provides strong encouragement for continued exploration of the use of bibliotherapy as a treatment method (e.g., Allen, 1973; Beneke & Harris, 1972; Gilbert & Ewing, 1965; Hagen, 1974; Young, 1973).
These studies provide some needed data regarding the utility and feasibility of employing bibliotherapy as a treatment modality.

Self-Administered Treatment by Bibliotherapy: A Review

This section reviews selected studies which have explored the use of written, self-instructional material (i.e., bibliotherapy) in the behavioral treatment of academic as well as personal problems. Although there has been a sparsity of research work in this new and developing area, the empirical studies available provide valuable data regarding the efficacy and efficiency of this treatment modality. Three of the investigations reviewed represent experimental efforts to apply a bibliotherapy approach to study and academic improvement.

In an investigation of the effects of counseling with incoming university freshmen, Gilbert and Ewing (1965) compared bibliotherapy against traditional counseling. Ss were exposed to (a) Programmed Counseling in which they received help in the context of a personal relationship, (b) Simulated Programmed Counseling in which they read a self-help manual at home, or (c) no-treatment control. The results showed that the two treatment programs were more effective than no counseling at all, although there were no significant differences between them in treatment outcomes on the dependent measures. These findings were interpreted as lending support to the efficacy and practicality of employing a bibliotherapy approach to the treatment of academic difficulties.

Beneke and Harris (1972) examined the comparative effects of two
modes of instruction in effective study methods--twice-weekly group
discussions versus written self-instructional lessons. Thirty-eight
undergraduates were trained in the application of self-control techniques
for the improvement of study habits and subsequent academic performance,
with 30 assigned to group instruction and 8 to written instruction of
identical content. Both study-improvement programs consisted of the use
of self-monitoring, stimulus control, self-reinforcement, self-punishment,
SQ3R method of study, and general tips in note-taking and exam-taking
skills.

The most significant finding was the severe attrition rate, with
28 percent of Ss dropping out of the program after attending only one
meeting, and 83 percent leaving before completing all 11 lessons.
Excluding the data of the immediate dropouts, there were no differences
between group-administered and self-administered conditions in the mean
number of completed lessons. In comparison with nontreated students and
dropouts Ss, treated Ss displayed a significant improvement in G.P.A.
for the three semesters following the study over the two preceding
semesters. Moreover, those Ss who completed more lessons (7-11) showed
significantly greater improvement in grades than those completing fewer
lessons (1-6); such G.P.A. gains endured for two semesters following
the program. There were no differences in G.P.A. gains, however,
between Ss who received and read the lessons in written form. These
results were interpreted as offering some support to the economical use
of self-instructional study materials with large groups of under-
achieving students. The major problem associated with such an approach
to study self-improvement, however, is keeping participants from
dropping out of the program.

In another experimental investigation of the self-application of effective study methods, Allen (1973) compared the relative efficacy of relaxation training and study counseling, transmitted through two instructional modes--group-administered and self-administered--on test anxiety and academic performance. That is, treatment consisted of study counseling or study counseling plus relaxation training, conveyed via either small weekly discussion groups or written self-instructional manuals. In addition to these four experimental conditions, there were three control groups--attention placebo, testing control, and minimal contact--to which some of the 84 test-anxious college student-volunteers also were randomly assigned.

The results indicated that all group-administered and self-administered treatments were equally effective in reducing test anxiety and enhancing examination performance, and significantly more effective than no treatment. The four study-related treatments also produced significant improvement in coursework G.P.A. as compared with both placebo and no treatment; there were no differences, however, between the treatment conditions and placebo on self-reported reduction in test anxiety and improvement in examination performance. Hence, the mode of training--whether discussion groups or self-instructional manuals--generally made no significant difference. There was one differential outcome associated with the two methods of administration of treatment, however, in that a larger percentage of students in the self-administration condition (41%) as opposed to those in the group-administered condition (29%) dropped out from treatment. On account of the higher attrition
rates for self-instructional treatment, it was recommended that use of
the study manual be combined with weekly group meetings, in an attempt
to balance the advantages and disadvantages of each training mode.

Allen's (1973) findings of equivalent magnitudes of G.P.A.

improvement for different modes of administration of treatment are
congruent with those of Beneke and Harris (1972), who found group-
administered and self-administered counseling equally effective. These
results, however, are at variance with those of a number of desensiti-

zation studies, such as Donner and Guerney (1969), who reported
significant differences in G.P.A. improvement for Ss receiving group-
administered as compared with self-administered desensitization.

Hagen (1974) conducted an informative study in which the relative
contributions of face-to-face contact and written materials were
systematically evaluated. Eighty-nine college coeds were treated for
obesity under four conditions: (a) self-instructional manual, (b) self-
instructional manual plus group contact, (c) group contact, and (d) no-
treatment control. Ss exposed to bibliotherapy only received instruction
and feedback exclusively through written communication, whereas Ss in
group therapy received all instruction and feedback via group
presentation. Ss in the combined bibliotherapy and group therapy
condition obtained written communication of instruction in addition to
face-to-face contact within a group setting. Three male graduate
students in clinical psychology served as group therapists in the
treatment program, which lasted 11 weeks.

It was found that all three treatment conditions resulted in
significantly greater weight loss than that produced by no-treatment
control, although the treatment groups did not differ significantly from each other. Assessment conducted at 4-week follow-up showed no significant changes in weight. Interestingly, Ss who attended group meetings reported that their treatments had been significantly more helpful than Ss who received the manual only. In addition, while the treatment groups did not differ in changes in physical activity, they did differ significantly from one another in changes in eating habits. No significant differences were found in therapist effectiveness. Data on attrition showed that only one subject, a member of the control group, dropped out.

In the light of these findings, Hagen concluded that (a) a self-instructional manual had been derived which is effective in the treatment of obesity, and (b) the importance traditionally assigned to the face-to-face personal-contact aspect of treatment may have been overrated, at least in the treatment of obesity. In short, the study provided evidence pointing to the possibility of an economical treatment for obesity available at nominal cost to all who can read.

In a study unique to research on smoking, Young (1973) designed a self-control treatment program which was conducted entirely through the use of self-instructional manuals, written in a programmed learning format. All treatment procedures were conveyed via bibliotherapy; the experimenter never met with any of the subjects, nor did he provide more than cursory advice by telephone. All materials--including manuals, questionnaires, and record forms--were sent out and returned through the mail, and all data with the exception of posttreatment follow-up were collected in the same way. Requests for help by participants were
handled by referral to the appropriate sections of the treatment manual.

The most significant outcome of the study was that 70 percent of Ss dropped out of the program prior to the end of the 15-week data collection period. The author attributed this high dropout rate to the complexity of the treatment instructions and to the perceived irrelevancy of the program to stopping cigarette consumption. The smoking data of the remaining Ss showed that the mean smoking rate for all treatment groups declined significantly over the course of the program. Self-reinforcement appeared to be the most potent self-control procedure leading to reduction in smoking. A majority of Ss, however, reported that they did not actually apply the self-control methods, including self-reinforcement, contained in the manual. The investigator concluded that in the absence of control groups with more than minimal therapist contact, no firm conclusions could be drawn regarding the efficiency of the exclusive use of bibliotherapy; nevertheless, the large number of dropouts from the program indicated that the level of efficiency of the present approach could be improved greatly. All in all, the results of the study suggested the practicality of using a totally self-instructional program in self-control. The results underscored the importance of including procedures in self-control programs for motivating participants and keeping them from dropping out.

**Summary and Conclusions**

Although the literature to date on behavioral intervention through bibliotherapy has consisted of only a handful of investigations, the available evidence offers some empirical support for the utility of
this treatment alternative. Four of the reviewed studies (Allen, 1973; Beneke & Harris, 1972; Gilbert & Ewing, 1965; Hagen, 1974) were designed specifically to compare experimentally the efficacy of behavioral treatment offered in the context of a personal relationship versus that provided by means of bibliotherapy. Each of these investigations demonstrated that self-administered treatment by bibliotherapy and group-administered treatment with personal contact were equally effective with respect to one another and significantly more effective than no treatment. In each case these results were interpreted as lending experimental support for the efficacy of employing bibliotherapy as a treatment modality.

Taken collectively, these investigations have demonstrated the utility of employing bibliotherapy as a method for treating a variety of problem behaviors. Three of the studies reviewed (Allen, 1973; Beneke & Harris, 1972; Gilbert & Ewing, 1965) found bibliotherapy effective in improving study and academic performance; the fourth study (Hagen, 1974) reported the successful treatment of obesity via bibliotherapy. Another investigation (Young, 1973) explored the exclusive use of bibliotherapy for the reduction of smoking, with limited success.

These promising findings, however, are mitigated by the absence of placebo groups in all but one (Allen, 1973) of the studies. Since mere exposure to functionally nontherapeutic procedures frequently results in outcome improvement, inclusion of a placebo treatment procedure is necessary if the effectiveness of the treatment is to be demonstrated over and beyond nonspecific (e.g., expectancy) effects. When placebo controls were instituted, as in Allen's (1973) study,
significant differences were found between treatment and placebo in coursework G.P.A., but not in test-anxiety reduction and examination-score improvement.

The therapeutic promise of a bibliotherapy approach is also mitigated by research findings that self-administered treatment by bibliotherapy results in a higher attrition rate. Beneke and Harris (1972) reported that 83 percent of Ss dropped out before completing treatment. Allen (1973) found that self-administered treatment resulted in a 41% dropout rate as compared with 29% for group-administered treatment. Young's (1973) bibliotherapy program suffered a heavy mortality rate of 70 percent. The only bibliotherapy approach not plagued with this serious problem was that of Hagen (1974), who reported a single dropout, a control S.

In conclusion, more definitive investigations including adequate (e.g., placebo) controls are required to validate the efficacy of using self-administered bibliotherapy as a viable treatment alternative. Additional experimentation also is needed to discover the variables influencing the efficiency of bibliotherapy; in particular, research attention needs to be directed at the development of methods for motivating participants in bibliotherapy to continue their involvement and preventing them from dropping out. Current research findings regarding the severe attrition rate associated with bibliotherapy spell an ominous portent for the continued use of this treatment modality.
CHAPTER VI
THE EXPERIMENT: AIMS AND HYPOTHESES

This chapter outlines an experiment for testing the application of behavioral self-control in the natural environment. The study investigated the feasibility of training individuals in the use of strategies and methods of self-directed behavior change. The research aims and experimental hypotheses of the investigation are presented.

**General Research Questions**

First, the study attempted to specify the active therapeutic ingredients within behavioral self-control manipulations which are responsible for the observed effects. The research question raised was: What is the relative contribution of each of the major self-control procedures contained in a behavioral treatment package in effecting behavior change? The present experiment was designed to provide empirical data on this critical research issue.

Second, the investigation focused on the following questions: (a) Can a written presentation of self-control methods produce significant improvement in the target behavior in the absence of regular, face-to-face contact? (b) Does attendance in a group, which includes personal contact, make a contribution to treatment over and above the procedures provided through written communication? Accordingly, the differences systematically investigated involved differences in manner of presentation of the instructional material, in connection with the presence or absence of a therapy group and therapist. The experiment
was designed expressly to compare the relative efficacy of written, self-instructional material and face-to-face, group contact in producing behavior change.

In the present study, the treatment package used for the development of self-control behaviors consisted of three major ingredients--self-monitoring, stimulus control, and contingency self-contracting. The contribution of each of these components to treatment was selected as one of the independent variables under investigation. These treatment components were included within two modes of training--self-administered instruction and group-administered instruction--constituting the second independent variable. The efficacy and efficiency of this intervention model were tested by applying it to the development of self-control of study and academic behavior.

The choice of study and academic performance as the target of intervention in the current investigation was based on the following considerations: (a) the management of study and academic behavior fits appropriately within the framework of behavioral self-control: (b) the social significance of grades gives rise to a large, available pool of subject-volunteers desiring improved grades; (c) study behavior represents a discrete, easy-to-define response, thereby facilitating self-monitoring of studying and increasing its reliability; and (d) studying represents a dependent variable which may be corroborated independently by a number of reliable and nonreactive, concomitant measures, including quiz scores, test performance, homework completion, and quarter grades.
Specific Research Aims

Specifically, the present investigation attempted to develop and evaluate a "Self-Improvement of Studying" Program for training students in behavioral self-control procedures for enhancing their studying and academic performance. The program was designed to teach intermediate and high-school students, via different instructional modes, self-control techniques for effectively managing their study behavior. First, the relative contribution of three major methods of self-control—self-monitoring, self-directed stimulus control, and contingency self-contracting—was compared in terms of bringing about study and academic improvement. Thus one portion of the research design was addressed to the following issue:

1. To what extent does each of the major self-control strategies comprising treatment for study improvement contribute to the overall effectiveness of the program?

Second, the relative efficacy of two primary modes of training—self-instructional manual versus group supervision—in bringing about study and academic improvement was evaluated. Accordingly, another portion of the experimental design of the study attempted to provide answers to the following questions:

2. Is a self-instructional manual of behavioral methods of self-control sufficient in producing significant improvement in studying and academic performance?

3. Is group supervision in behavioral self-control procedures necessary in producing significant improvement in studying and academic performance?
Experimental Hypotheses: An Overview

Experimental Variables

The two experimental factors selected as the principal independent variables under investigation were:


Experimental Questions

The present study was designed to provide answers to the following questions:

1. Is self-monitoring alone more effective than no treatment in improving study and academic performance?
2. Is a combination of self-monitoring and stimulus control more effective than self-monitoring alone in improving study and academic performance?
3. Is a combination of self-monitoring, stimulus control, and contingency contracting more effective than self-monitoring plus stimulus control in improving study and academic performance?
4. Is a combination of self-administered and group-administered treatment more effective than self-administered treatment alone in improving study and academic performance?
5. Is specific treatment consisting of self-monitoring, stimulus control, and contingency contracting more effective than
nonspecific expectancy and group factors in improving study and academic performance?

6. Is any form of treatment more effective than no treatment in improving study and academic performance?

Experimental Conditions

The research design consisted of the following experimental conditions:

1. Self-Monitoring Control
5. Self-Monitoring + Stimulus Control + Contingency Contracting: Manual + Group
6. Attention-Placebo Control
7. No-Treatment Control: Interested
8. No-Treatment Control: Uninterested

Experimental Hypotheses

The following constituted the general and specific hypotheses of the investigation:

General Hypotheses

The hypotheses regarding the general effects of the study
were:

1. The effect of the application of behavioral self-control procedures is to increase study behavior.
2. The effect of the application of behavioral self-control procedures is to enhance academic (i.e., test) performance.
3. The effect of the application of behavioral self-control procedures is to improve study habits and attitudes.
4. The effect of the application of behavioral self-control is to alter the individual's perception of the causes of his behavior (i.e., attribution) in the direction of internal locus of control.
5. The effect of the application of behavioral self-control procedures is to reduce test anxiety.
6. The effect of the application of behavioral self-control is to change the student's evaluation of his emotional and cognitive reactions to studying in preparation for exams.

Specific Hypotheses

The hypotheses regarding the specific effects of the experiment consisted of the following predictions of relative treatment effectiveness:

1. The self-application of self-monitoring is more effective than no-treatment control conditions in improving study and academic performance.
2. The self-application of self-monitoring and stimulus control is more effective than the use of self-monitoring alone in improving study and academic performance.
3. The self-application of contingency contracting in combination with self-monitoring and stimulus control is more effective than the use of self-monitoring and stimulus control in improving study and academic performance.

4. The use of group supervision in conjunction with a self-instructional manual in behavioral self-control is more effective than the use of manual alone in improving study and academic performance.

5. A combination of specific treatment is more effective than nonspecific (i.e., placebo) treatment in improving study and academic performance.

6. Any form of specific and nonspecific treatment is more effective than no treatment in improving study and academic performance.
CHAPTER VII

METHOD

This chapter provides a description of the setting, subjects, procedure, and experimental design of the study.

Setting

Physical Setting

The present study was conducted at Iolani School, an all-male college-preparatory school in Honolulu. A private, church-affiliated school of approximately 1,500 students, Iolani was divided into a Lower School and Upper School, with the former encompassing grades kindergarten through six and the latter grades seven through twelve. The "Self-Improvement of Studying" Program was offered to the intermediate and high school students of the Upper School.

Temporal Setting

The study was conducted during the second and third quarters of the 1974-75 academic year. Each academic quarter encompassed a nine-week period, with the second quarter extending from November 4, 1974 through January 19, 1975 (including two weeks of Christmas vacation) and the third quarter from January 20, 1975 through March 23, 1975.

The daily class schedule for the Upper School consisted of eight periods of fifty-minutes duration. School started at 7:45 a.m. and ended at 3:00 p.m. Academic coursework for the intermediate or
high school student typically consisted of four "solid" subjects, one elective, and two free periods. With few exceptions, classes were scheduled for the same time period every day of the week (Monday through Friday). Seventh- and eighth-grade students attended mandatory study hall, usually two periods a day. Students in grades nine through twelve exercised the option of spending their free periods at the library, language laboratory, student center, or designated lounging areas on campus. Other times of the school day spent outside of class included a ten-minute homeroom period and a fifty-minute lunch period, during both of which students were generally free to study if they wished. With the exception of seniors, all students were required to remain on campus during their free periods.

Subjects

Selection of Subjects

Recruitment

All students in grades seven through twelve inclusive were invited to participate in a voluntary, extracurricular program in the self-improvement of studying. The entire student body of the Upper School was informed of the study-improvement program through the following recruitment methods. On the first day of the second quarter, every student received a letter of invitation (see Appendix A) in homeroom from the experimenter (E). Attached to it was a cover letter (see Appendix B) from the Headmaster of the school, introducing the program and encouraging students to consider participating in it. Included
was a return form on which interested students indicated their desire to enroll in the program or learn more about it. Minutes later at the weekly Monday morning assembly held during the homeroom period, the Headmaster personally introduced E, who presented a brief description of the program. Students were invited to sign up for the program or inquire more about it by meeting with E, who manned a display table on campus during the remainder of the day. The recruitment campaign was conducted throughout the first week of the quarter, and consisted primarily of informal discussions with interested students. E also was invited to several classes to talk about his program. In addition, a number of students were personally encouraged by counselors and teachers to participate in the study-improvement program. As a result of these recruitment efforts, 275 (30%) of 905 students enrolled in the Upper School expressed an initial interest in the study program.

Enrollment

Prospective program participants were asked to attend an introductory meeting, during which they were informed that since there were more interested students than could be accommodated, it was necessary to consider for selection only those who were willing to participate fully in the program. It was pointed out that students accepted for the study-improvement program with less than a sincere desire to involve themselves completely in it deprived a more worthy student of the opportunity to participate. Therefore, all students were asked to consider carefully whether they were willing to undertake a personal commitment to participate fully in the program throughout its
duration. If so, they were to sign a commitment contract stating such. If not, they were to remove themselves from consideration for selection.

The placing of the student's signature on the commitment form represented the first step in enrolling in the study program. The second enrollment step called for the prospective participant to obtain the written permission of his parents. As the third step, the academic records of the prospective participant were examined to ascertain his academic eligibility to participate in the study. The fourth enrollment step required the student to fill out a series of questionnaires. Those students meeting all four requirements for enrollment in the program constituted the subject population of the study. Altogether, 140 students served as subjects (Ss) in the study, including 115 (42%) of those who had indicated an early interest in the program and 25 control students who had shown no such interest.

**Subject Characteristics**

*Demographic Profile*

The S population reflected the demographic characteristics of the school as a whole in its socioeconomic and ethnic group composition. Ss were predominantly middle-class youth of Chinese, Japanese, Caucasian, Korean, Filipino, and Samoan racial ancestry. These boys ranged in age from 12 to 18 years and comprised grades seven through twelve. The breakdown of Ss by grade-levels may be found in Table 1.
### Table 1
Classification of Subjects by Grade-Levels

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<th>Grade Level</th>
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<th>n of School Population</th>
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<th>Percent of Total School Population</th>
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<td>22.9</td>
<td>3.5</td>
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<tr>
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<td>145</td>
<td>13.6</td>
<td>2.1</td>
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<td>21.4</td>
<td>3.3</td>
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<td>157</td>
<td>9.3</td>
<td>1.4</td>
</tr>
<tr>
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<td>12</td>
<td>142</td>
<td>8.6</td>
<td>1.3</td>
</tr>
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<td>140</td>
<td>905</td>
<td>100.0</td>
<td>15.5</td>
</tr>
</tbody>
</table>

**Academic Profile**

In terms of academic aptitude and achievement, the sample was characterized by scores on the following dimensions. Participants in the study-improvement program attained mean scores of 39.2 (S.D. = 10.5), 45.5 (S.D. = 10.4), 84.7 (S.D. = 19.2), and 121.5 (S.D. = 11.9) in verbal, quantitative, total, and total IQ, respectively, of the Kulman-Anderson Test, which had been administered routinely to all students at Iolani School. In addition, program participants achieved a mean cumulative grade-point average (G.P.A.) of 2.82 (S.D. = 0.68) in their Upper School courses at Iolani, and a mean G.P.A. of 2.76 (S.D. = 0.58) in the preceding academic quarter.
Personal Profile

The subject characteristics of program participants also were defined in terms of scores on a variety of self-report measures. The means and standard deviations of Ss' scores on assorted paper-and-pencil questionnaires are contained in Table 2.

Procedure

Introduction of Program to Participants

Students expressing an interest in the study-improvement program were invited to attend a 30-minute introductory session. The following information was provided in both oral (i.e., verbal presentation) and written (i.e., literature hand-out) modes (see Appendix C), as part of the introduction of the program to prospective participants.

Program Description

The study-improvement program was presented as an attempt (a) to teach students helpful and effective methods of enhancing their studying and academic performance through the use of a self-instructional manual, and (b) to evaluate various sections of the self-instructional manual to determine which self-improvement techniques were more effective than others. It was explained that participants would be given different parts of the self-instructional manual to read and follow. It was emphasized that by systematically applying the suggestions contained in their study manual, students were likely to improve markedly in their
Table 2
Means and Standard Deviations of Paper-and-Pencil Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>n</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey of Study Habits and Attitudes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay Avoidance</td>
<td>99</td>
<td>19.10</td>
<td>9.21</td>
</tr>
<tr>
<td>Work Methods</td>
<td>99</td>
<td>21.39</td>
<td>8.25</td>
</tr>
<tr>
<td>Teacher Acceptance</td>
<td>99</td>
<td>25.31</td>
<td>9.19</td>
</tr>
<tr>
<td>Education Acceptance</td>
<td>99</td>
<td>23.61</td>
<td>8.00</td>
</tr>
<tr>
<td>Study Habits</td>
<td>99</td>
<td>40.50</td>
<td>15.68</td>
</tr>
<tr>
<td>Study Attitudes</td>
<td>99</td>
<td>48.92</td>
<td>15.98</td>
</tr>
<tr>
<td>Study Orientation</td>
<td>99</td>
<td>89.41</td>
<td>28.84</td>
</tr>
<tr>
<td>Internal-External Locus of Control</td>
<td>100</td>
<td>9.67</td>
<td>3.81</td>
</tr>
<tr>
<td>Test Anxiety Scale</td>
<td>100</td>
<td>18.60</td>
<td>6.70</td>
</tr>
<tr>
<td>Semantic Differential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluative</td>
<td>101</td>
<td>24.71</td>
<td>8.60</td>
</tr>
<tr>
<td>Cognitive</td>
<td>101</td>
<td>13.66</td>
<td>6.57</td>
</tr>
<tr>
<td>Psychoticism - Neuroticism - Extraversion Inventory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychoticism</td>
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<td>4.12</td>
<td>2.62</td>
</tr>
<tr>
<td>Extraversion</td>
<td>101</td>
<td>13.01</td>
<td>3.41</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>101</td>
<td>11.67</td>
<td>4.29</td>
</tr>
<tr>
<td>Lie</td>
<td>101</td>
<td>3.87</td>
<td>2.81</td>
</tr>
</tbody>
</table>
academic work and at the same time help to enhance the effectiveness of the manual. In addition, Ss were impressed with the importance of keeping records of their study behavior for their own benefit as well as for the purpose of objectively evaluating the study manual.

Program Integrity

The relationship of the self-instructional study program to Iolani School was carefully delineated. During the recruitment and enrollment of Ss, it was emphasized that the study-improvement program was being conducted independently as a research/service project by a person from the University of Hawaii. As such, the study program was administratively separate from Iolani School, which had allowed it to be conducted and was interested in its overall results. It was suggested that particularly effective aspects of the study program might later be incorporated into the educational and counseling services offered by the school. In this connection, students were assured that how much studying they did or how much success or failure they experienced in using the study manual would have no bearing on their standing in the school. It was stressed that while the administration and faculty were interested in the general outcome of the study, none of the results in terms of study records and academic performance of individual students would be made available to them.

Enrollment of Participants in Program

Students who met each of the following four requirements for
participation in the study-improvement program were allowed to be enrolled.

Signing of Commitment Contract

Students enrolling in the study program were requested to enter into a formal contract (Appendix D) with E in which they agreed to undertake a personal commitment to participate fully in the program until its completion. In return, E agreed to provide each participating student with a complimentary copy of the study manual and related study-aid materials. All Ss signed this performance contract as a precondition to participation in the study (i.e., before receiving a copy of the study manual). E also put his signature to each individual contract, as did a third party (i.e., school counselor, parent, teacher, or classmate), who served as a witness for the two parties involved. One copy of the contract was given to S, while a second copy was retained by E.

Obtaining of Parental Consent

All prospective students were required to obtain the written permission (see Appendix E) of their parents, granting approval for them to participate in the program and allowing E access to their academic records.

Meeting of Academic Eligibility Requirements

All prospective students were required to meet the following two criteria of academic eligibility as a prerequisite for program
participation: (a) they had attained a cumulative G.P.A. of 3.8 or lower (based on a 4-point scale) in their academic career in the intermediate and/or high school grades at Iolani, and (b) they had obtained a G.P.A. of 3.8 or lower in the preceding academic quarter. These eligibility requirements served merely to exclude those students who had achieved such high G.P.A.'s that any improvement in grades would be limited or obscured by a ceiling effect.

Completing of Assessment Questionnaires

A number of questionnaires and inventories were given to all Ss to complete at home during the first two weeks of the study program. Ss generally spent 30-45 minutes of their own responding to this battery of paper-and-pencil instruments.

Differential Treatment of Subjects

Assignment of Subjects to Treatment Conditions

Ss were stratified on the basis of grade-level, which ranged from seventh to twelfth grade. Then they were randomly assigned from blocks of seven to one of the seven experimental conditions, using a table of random numbers. This method of treatment assignment served to ensure the equivalence of all groups in terms of the grade-level distribution of Ss.
Ensuring of Purity in Treatment Conditions

Since Iolani was a relatively small community, it was likely that participants in the study-improvement program would have occasion to talk with one another about the program. Such mutual sharing of information regarding the nature of the program could result potentially in the contamination of treatment conditions. In view of this possibility, active steps were undertaken to stem the disclosure of such information among program participants. The problem was handled directly in the following manner.

Ss were told from the onset that they would be given different sections of the self-instructional study manual, and that they were to read and follow only the instructions contained in the study manual which they received. The reasons for this were explained in terms of the research objectives of the study-improvement program in determining which study procedures were most helpful. It was pointed out that while all the study techniques contained in the manual were likely to be useful for enhancing studying and academic performance, some methods were likely to be more powerful than others. It was explained further that the procedures with more apparent face-validity than others may or may not be more effective; which study methods were most effective could only be ascertained through careful scientific comparisons such as the one currently being conducted. In order to avoid destroying the scientific nature of the research study and introducing error into the results of the study, Ss also were explicitly requested not to read the study manuals of their classmates participating in the program, and not to discuss with each other the various study procedures that
they were using.

It was emphasized that by following these instructions participants could help to make the program a true research endeavor by ensuring the validity of the planned scientific comparisons. Moreover, as pointed out by E, there was little reason for any collusion on the part of participants since research findings as to the most powerful study methods would be shared subsequently with all participants. Finally, it was stressed that by applying only the study techniques included in their respective manuals, participants could contribute to improving the effectiveness of the study manual for the benefit of future students.

The extent to which Ss responded to this straightforward plea not to share information about treatment procedures was assessed as part of the posttreatment questionnaire at the conclusion of the investigation.

Collection of Data

Keeping of Study Records

The procedures for the collection of behavioral data constituted an integral part of the study-improvement program. Record-keeping procedures were designed carefully to make the recording of studying behavior a simple, quick, and convenient operation, so as to increase the likelihood of Ss engaging in record-keeping on a consistent basis. All the materials required for record-keeping were a pocketsize diary, a pencil, and a watch or clock. The study diary (see Appendix F)
employed as a daily recording form was sufficiently small and portable to be carried wherever studying occurred.

Student-participants were requested to keep a continuous record of their study behavior throughout the duration of the program. The daily study dairy was provided for this purpose. They were instructed to carry it with them everywhere they might study throughout the day. Whenever they studied, they were to make an entry of the subject studied, the time they started studying, the time they stopped studying, and the number of minutes studied. In this way, they were to record every instance of studying throughout the day. Upon making the last entry of the day, Ss simply added up the number of minutes of studying throughout the day. At the end of the week, Ss tallied the total amount of minutes spent in studying during the week. Then they calculated the average daily study time for the week and entered it onto an ongoing behavioral graph of their frequency of studying. This graph was maintained by Ss throughout the duration of the program.

It was stressed that program participants keep an accurate and honest record of all their study times during the day, that they make entries in their study diary on a continuous basis, and that they do not include in their diary any instances in which they did not actually study. They were told that since no one other than E would ever see their study diary, they could be assured that the information contained in it would be treated confidentially. Thus, however much they found themselves studying, they ought to feel no reluctance to record and report their study times honestly and faithfully.

It was emphasized that accurate and reliable records of study
behavior represented a fundamental requirement of the study program. Students were told that such a daily study record was extremely valuable in that it provided them with useful information about their studying behavior and simultaneously served as an excellent means of evaluating the study-improvement program. No records or faked records were regarded as more damaging to the program than accurate records which showed no benefits accruing from the use of the study manuals, since negative results could lead to improvement of the manual whereas false results were misleading.

Finally, Ss were instructed to turn in their diary every week and at the same time pick up a fresh diary for the forthcoming week. They were asked to make every effort not to misplace or lose their diary. If they should do so, however, they were to continue their recording of study times on any available paper and transfer this information to a new diary as soon as possible.

Gathering of Baseline Data

Program participants, with the exception of students randomly selected as no-treatment controls, then were instructed to keep a baseline record of their studying during the next several weeks until the study manuals became available. A study diary was given to them for this purpose, and was to be placed in a box in the office of the secretary to the Assistant Headmaster on Monday morning of each week.
Monitoring of Record-Keeping Operations

Throughout the duration of the program, the submittal of each week's study diary was monitored carefully and continuously for each S. Any S who had not turned in his study diary by Wednesday of each week was sent via campus mail a mimeographed reminder from E. If study records were still not received by the subsequent Monday, a personal note signed by E was sent to those students with tardy diaries. If no study records were forthcoming by the following Monday, E personally got in touch with these Ss and attempted to resolve the source of their record-keeping difficulties. Such monitoring of Ss' study diaries helped to ensure that each S maintained ongoing records of his study behavior. Thus, any S lapsing in his data collection for even a week was contacted and encouraged to stay with it. In this way, any hindrances to record-keeping were overcome with a minimum of lost data.

Implementation of Treatment

Dissemination of Self-Instructional Manuals

After several weeks of baseline data collection, Ss were given the initial installments of their self-instructional manual in accordance with the random assignment of Ss to treatment conditions. The subsequent segments of the study manual were distributed at fixed points in time throughout the program. Student-participants were asked to read each section of the study manual within two days of receiving it, and to begin immediately thereafter to follow the instructions and suggestions contained in it. Each major unit of the manual required the student to
fill out various forms designed to help him plan and implement action-
steps to be undertaken throughout the week.

Meeting of Student Groups

Two weeks after dissemination of the initial segment of the study manual, half of the experimental Ss commenced to meet in small groups at approximately weekly intervals. These groups of students met six times over a period of six weeks. Sessions were conducted during lunch period; participants had twenty minutes to have their lunch before assembling in their groups for the remaining thirty minutes of the period. Since students had either fifth or sixth period free for lunch depending on their particular schedule, group meetings for Ss in the same treatment condition were offered during both lunch periods on a given day. As a result, each of these group sessions was attended by roughly half of the Ss in a given condition.

Reliability of Data

The reliability of the behavioral measures employed in the investigation was established by a number of means. Reliability refers to the consistency of the measurements—that is, whether the same value was observed with repeated measurements, or with measurements using more than one observer or instrument. In the present experiment, the reliability of data on two major classes of behaviors was assessed: the reliability of dependent measures (i.e., target behaviors) and the reliability of operations (i.e., treatment behaviors).
Reliability of Dependent Measures

The primary dependent measure of the study consisted of Ss' self-observations and self-reports of the frequency of their studying behavior. The reliability of these self-recordings of study behavior was evaluated through two means: (a) the independent monitoring of studying by an external observer and (b) the concomitant monitoring of related measures.

Monitoring of Studying by External Observer. Although participants self-monitored and self-recorded their studying wherever it occurred, it was not possible for independent observations to be done in multiple settings. Accordingly, behavioral observations of studying were conducted by an external observer in a single setting--the school library--which was regarded as representative of other study settings. Sufficient observational samples of studying in this one setting were obtained to permit some valid, albeit limited, inferences to be drawn regarding the reliability of self-recorded study data in other settings.

The school library was selected as the site of independent observations due to the fact that virtually all Iolani students did some of their studying in the library. During the school day, students typically had one or two free periods in addition to lunch period during which they could study. The majority of students chose to do most of their studying during school hours at the library, since it was the one place on campus especially designated for noise-free studying. The school library was designed specifically as a study environment, consisting of numerous individual carrels laid out within carpeted and air-conditioned confines. In a sense, the library assumed the
atmosphere of a large, central study hall, insofar as a teacher-proctor was always present. The physical layout of the school library was particularly conducive to relatively unobtrusive surveillance of all students with minimal patrolling necessary.

All independent observations of Ss' studying in the library were conducted by a single external observer, O, who was E himself. Since E was seen frequently in the library handing out study-aid material to program participants and doing administrative work, his presence during the observational period was not particularly obtrusive. Systematic samplings of observational data on studying behavior were collected throughout each school day, Monday through Friday, of the fourteenth week of the study program. The decision to assess the reliability of self-recorded study data late in the program was based on the necessity of O knowing all Ss by name. By Week 14, O recognized on sight the faces of virtually every participant in the program.

The observational procedure consisted of the following steps: Throughout most of the school day for five consecutive weekdays, O took a seat at the library which offered the best vantage point for monitoring students. Employing a standard recording form, O independently and unobtrusively recorded all instances wherein student-participants were observed engaging in studying. Studying was defined as attending to the learning material at hand; accordingly, students who were reading, writing, or otherwise oriented to their work were considered to be engaged in studying (S) behavior. On the other hand, students who were resting their heads on the desk, walking around, or talking with friends were regarded as engaged in non-studying (NS) behavior. O attempted to mark
down the precise time that each $S$ initiated and terminated an episode of studying at the library. Thus $O$ wrote down the time that $S$ first started to attend to his work or, if not, the time that $O$ first observed $S$ engaged in studying. If $O$ observed $S$ involved in non-studying activity at any time for more than a minute, $O$ indicated this event (i.e., NS) on his recording sheet and noted the time that studying had ended. In this way, $O$ obtained a systematic record of $S$s' separate episodes of studying in the library throughout the day.

These samplings of independent observations by $O$ were compared with the self-recorded data contained in $S$s' study diaries for that week. The reliability of the self-recorded study data was assessed simply as a function of the degree of agreement between self-monitored and externally-monitored data. That is, employing $O$'s behavioral observations of studying as the criterion measure, the entries in each $S$'s study diary were matched with the corresponding entry in $O$'s study log. The degree of correspondence was calculated as a function of the average percentage of agreement across relevant entries across $S$s throughout the week between $O$'s observations of $S$'s studying and $S$'s self-observations of his own studying. More specifically, a reliability coefficient was computed using the following formula (Bijou, Paterson, Harris, Allen, & Johnston, 1969):

$$\text{reliability index} = \frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}} \times 100\%$$

wherein agreements were defined as instances in which $O$'s and $S$'s recorded times of study episodes corresponded within five minutes of
each other, and disagreements as recordings of study time which did not correspond. In short, O's independent observations served as a limited check that, in the library setting at least, S actually studied whenever he reported that he had studied, and S reliably reported that he studied whenever he had studied.

Monitoring of Related Measures. Another check on the reliability of the self-recording of study behavior was the concomitant monitoring of related measures. If improvements in study frequencies were reported, increases in academic performance as measured by grades would be expected to follow. Grades are often, though not always, functionally related to time spent studying, and thus may be used to corroborate self-reported study improvements. At the end of the quarter, the grades in individual courses were readily correlated with study time spent in each course during the quarter. These correlations provided an index of the degree of correspondence between studying and academic performance for each individual course. An additional, though somewhat less direct, check on the reliability of self-recorded study data was obtained by correlating each S's G.P.A. for the quarter with his self-reports of total study time over the quarter.

Reliability of Operations

Just as it is essential to corroborate S's self-reported data on the frequency of the target behavior, it is also imperative that an index of his follow-through is obtained. That is, the degree and consistency with which S actually implemented the treatment procedure
must be assessed. Otherwise, one may conclude that a self-control 
operation was ineffective when, in fact, it was simply never applied. This kind of check on follow-through is termed reliability of operations.

In the present study, only partial and somewhat indirect verification could be obtained regarding the reliability of operations of the self-implemented procedures. Establishment of the reliability of treatment operations was obtained in the form of self-reports. The posttreatment questionnaire simply asked Ss to indicate the extent to which they followed-through in carrying out the various aspects of the treatment program.

**Experimental Design**

**Overview**

The overall experimental design of the study was a repeated measures paradigm involving pre- and posttreatment assessment of variables in both performance and self-report domains. The research design using study rate as a dependent measure assessed the effects of six experimental conditions—four treatment and two control—and encompassed a period of sixteen weeks of school, including five weeks of baseline and eleven weeks of intervention. The intervention period was comprised of intervention I of five-weeks duration and intervention II of six-weeks duration. The design employing grade point as a criterion measure compared the effects of eight experimental conditions, four treatment and four control, across three time periods—prebaseline, baseline, and intervention.
Content of Treatment

Two different treatment approaches to self-control were utilized in the study-improvement program, behavioral self-control and dynamic willpower.

Behavioral Self-Control Approach

A behavioral intervention model for the learning of self-control was used as the primary treatment package in the study-improvement program. It was derived in large part from the experimental, how-to-study manuals developed by Watson and Tharp (1973) as well as Higa and Higa (1974). This behavioral approach to the learning of self-control was comprised of the following major ingredients:

Introduction to a Behavioral Approach to Self-Control. First, an overview of the learning of self-control through the application of behavioral principles was offered. Behavioral self-control was conceptualized as the individual's learned repertoire of skills for managing and altering his environment in ways that support desired behaviors. The rationale for this approach was explained in terms of the reciprocal and interactional nature of the relationship between the individual and his environment. Emphasis in this discussion was placed on the role of the environment in influencing behavior, and the importance of acquiring control over one's everyday environment as a means of gaining control of one's own behavior. Some of the advantages of this approach were discussed and illustrated. In particular, the utility of a behavioral model of self-control was underscored, in terms
of gaining personal control over not only one's study behavior but also many other aspects of one's life. Such an approach to the learning of self-control consisted of a series of procedures, based on principles of behavior change. These behavioral procedures were introduced in the following sequence in the treatment program.

**Stimulus Control.** This unit of the behavioral self-control program emphasized that the events which occur before studying exert a strong influence on the behavior of studying itself. Stimulus control was described as a method for facilitating the occurrence of studying through arrangement of the antecedent conditions which set the occasion for the act of studying. Accordingly, an important part of the systematic attempt to acquire behavioral self-control of studying called for the student to manipulate the environmental stimuli which set off, or cue, the act of studying. For example, the student was encouraged to establish regular times and places to study in accordance with a study schedule, so that these stimuli came to serve as eliciting cues for the occurrence of studying behavior.

**Shaping.** The principle of shaping—in which behavior is gradually learned and increased through a process of successive approximations—was then introduced. In this method of planned improvement, studying performance is progressively improved over time through setting of a series of intermediate subgoals leading to eventual attainment of the ultimate goal. The student was told that by engaging in such progressive goal-setting, he did not require of himself more
than he was capable of doing at any given point in time. Moreover, by not biting off more than he could chew, he could avoid unnecessary frustration. The student was urged to plan, on an individualized basis, for improvement at a small enough step at a time so as to ensure success. Progressively approaching his final goal in this way was presented as an effective means of increasing study behavior.

**Self-Contracting.** This part of the behavioral treatment program introduced the setting of explicit rules as another important method of controlling when, where, and how often studying occurs. The student was taught to specify the conditions under which studying was to occur. This specification assumed the form of a self-contract in which the student undertook a personal commitment with himself to fulfill the terms (i.e., rules) of the performance contract. It was pointed out that such individualized rule-setting made studying easier by providing a structure within which studying could occur. The student's study schedule spelling out the times and places of study could be included as a major part of the contract. This self-contract could also be revised at regular intervals so as to incorporate successive shaping steps for improving studying.

**Self-Reinforcement.** Here, it was emphasized that the events following the occurrence of studying also exert a powerful influence on it. That is, the behavior of studying can be strengthened by arranging for reinforcing consequences to follow studying. Contingency management was employed as a strategy for strengthening study behavior through manipulation of the environmental events that follow studying. The
treatment program called for reinforcement of studying through self-
administration of rewards by the student himself. The student was
instructed to set up a system of self-reinforcement wherein he rewarded
himself with material and activity reinforcers contingent upon the
performance of specified amounts of studying (i.e., "first study, then
reward"). These self-rewards were incorporated as an integral part of
the student's contingency self-contract. In some cases, the student
implemented an individualized study program employing a point (token)
system. Self-reinforcement was linked to the shaping steps in the self-
contract such that attainment of each subgoal in the self-improvement
program gained a prearranged reward.

Dynamic-Willpower Approach

An appeal-to-willpower constituted the attention-placebo
treatment of the study-improvement program. Basically, the dynamic-
willpower approach attempted to exhort the individual to take personal
control over his life, and was derived in part from the rhetoric
characteristic of Dale Carnegie (1948), Maxwell Maltz (1960), and Norman
Vincent Peale (1960). This dynamic approach to the development of
willpower consisted of the following series of instructions for
increasing the exercise of internal willpower over studying:

Introduction to a Dynamic Approach to Willpower. The major
thrust of this approach was focused on arousing the person to take
destiny into his own hands, to exercise self-determinism, to assume
complete responsibility for his own behavior, and to engage in positive
thinking in believing that he was capable of doing whatever he believed he could do. The immediate and long-term benefits of possessing self-discipline over one's life were spelled out and extolled. The existential implications of exercising internal willpower were discussed in terms of one being an organism with personal autonomy versus being an automaton with no free will, pushed about by the forces of fate. The following specific procedures were presented as a means of developing dynamic willpower in one particular area of the student's life--i.e., studying and academic performance--as a prelude to extending willpower to all facets of his everyday life.

**Studying in Multiple Settings and at Different Times.** This part of the dynamic-willpower program instructed the student to study in a wide range of places and times. The student was told that by studying in as many different settings as possible, he was learning to exercise personal willpower in multiple domains of his academic life. In this way, his willpower could be strengthened with the eventual result that he could gain complete control of his studying behavior throughout the entire day.

**Ultimate Goal-Setting.** It was recommended that the student carefully specify his ultimate goals in relation to studying. By delinating clear, ambitious goals and setting his sights on them, he could summon all the willpower available at his command to fulfill his study objectives at once. It was emphasized to the student that once he decided to take his academic life into his own hands, there was really no goal in studying which he could not achieve immediately.
Spontaneous Studying. This technique for developing dynamic willpower was based on the assumption that the student could greatly enhance his self-discipline by exercising his willpower on a completely spontaneous basis. The idea was to avoid setting rules for his studying—such as where, when, and what to study—because rule-setting merely served as a substitute for willpower. By engaging in studying on a completely spontaneous basis, the student was actively exercising and developing his personal willpower.

Associating Pleasant Activities with Studying. Here, it was suggested that enjoyable activities be paired with studying, on a "first reward, then study" basis. By doing so, studying was likely to become a much more enjoyable experience instead of an unpleasant chore. It was pointed out that after engaging in a reinforcing activity, the student was more likely to feel that now he ought to study. Under such circumstances, his exercise of willpower was greatly facilitated.

Mode of Treatment

Two distinct modes of intervention were employed in the study-improvement program—self-instructional manual, and self-instructional manual plus group supervision.

Self-Instructional Manual

This treatment mode consisted exclusively of the reading and following of a self-instructional manual (see Appendix J) on the self-improvement of studying. This how-to-study manual presented a step-by-
step outline of a self-administered program for gradually and systematically increasing studying and academic performance. The study manual was designed as a completely do-it-yourself enterprise, and was comprised of a series of successive segments which were distributed to participants at approximately biweekly intervals. Each major section of the self-instructional manual provided the student with specific instructions for carrying out its suggested study procedures. In order to facilitate the self-application of these procedures, at appropriate points the manual presented an outline of action-steps for the student to implement. These action-steps consisted of (a) a checklist of specific task-behaviors to be engaged in for the particular week, and (b) a worksheet for developing the specific plan-of-action to be undertaken during the week. These checklists and worksheets were completed and turned in by participants on a week-to-week basis.

Self-Instructional Manual Plus Group Supervision

This mode of treatment involved the use of a self-instructional study manual in combination with regular group meetings conducted by E. Ss in this treatment mode read and followed a self-instructional manual, and attended weekly meetings as a group throughout the duration of the program. During these group sessions the content of the manual was discussed, questions were answered, experiences were shared, and supervision on individual attempts to apply the suggestions in the manual was provided. In short, these group meetings were structured to provide an educational medium for the learning of self-control, beyond that afforded by use of the manual alone. In addition, the group served a motivational
function in acting as a vehicle for offering of prompts and encouragement, 
social monitoring of studying performances, sharing of successful 
experiences, and providing of reinforcement for progress. Each of these 
weekly group meetings lasted thirty minutes.

Experimental Conditions

Ss were randomly assigned to one of the following eight 
experimental conditions (with n of groups in parentheses), which 
constituted the research design of the study:

Self-Monitoring Control (n = 15)

Ss in this condition were given neither manual nor group 
treatment; they were instructed simply to keep a continuous record of 
their studying throughout the duration of the program. This condition 
served as a control on the effects of self-observing and self-recording 
one's own study behavior.

Self-Directed Stimulus Control: Manual (n = 16)

In addition to engaging in self-monitoring, Ss in this condition 
learned to exercise stimulus control over their studying behavior through 
reading and following a self-instructional manual.

Contingency Self-Contracting: Manual (n = 15)

These Ss were given a series of manuals instructing them how 
to use not only self-monitoring and stimulus control, but also 
contingency self-contracting techniques.
Self-Directed Stimulus Control: Manual + Group (n = 16)

Ss in this condition were trained to self-apply stimulus-control procedures via manual as well as group instruction. They also self-monitored their studying behavior throughout the program.

Contingency Self-Contracting: Manual + Group (n = 15)

These Ss received manual instruction and group supervision in the self-application of contingency contracting, along with self-monitoring and stimulus-control procedures.

Attention-Placebo Control: Manual Plus Group (n = 16)

This condition consisted of the use of a self-instructional manual on exercising internal willpower, in conjunction with weekly group meetings. The format of this dynamic-willpower approach was analogous to behavioral self-control treatment in virtually every respect, with the exception of its focus on exhorting the student to exercise self-discipline in his study life. The individual was directed to extend his willpower in a number of specific ways, corresponding topographically with each of the behavioral methods of self-control. The purpose of this group was to provide a plausible rationale and set of procedures which are essentially irrelevant to the experimental methods of treatment, yet which allowed for the operation of non-specific expectancy, therapist attention, and group interaction effects.

No-Treatment Control: Interested (n = 22)

Ss in this condition expressed an interest in participating in the study-improvement program, but were randomly selected to serve as
no-treatment controls. They underwent the same sequence of procedures as Ss in the other conditions, with the exception of treatment itself. No-treatment control Ss attended the introductory meetings at which they were given a battery of assessment questionnaires to complete at home, but engaged in no record-keeping. Shortly before treatment was scheduled to begin, these Ss were informed that due to limitations in the number of spaces available in the program, they would receive a self-instructional manual later in the school year. At the conclusion of the study program, these Ss were re-administered the assessment battery, ostensibly as additional preparation for entering the program. They subsequently were given the most effective treatment manual in toto. This condition served as a control for any effects associated with volunteering for treatment. This group also afforded a baseline comparison on relevant measures against which all other treatment conditions were evaluated.

No-Treatment Control: Uninterested (n = 25)

This condition was comprised of Ss who had not shown any interest in participating (i.e., they had not responded to the invitation to participate) in the study-improvement program. They were randomly selected from the general population of Iolani students, using the same criteria of selection as the other experimental conditions. Ss in this condition were asked to complete assessment questionnaires at the beginning and ending of the study program; otherwise, they received no treatment. Inclusion of this testing control group permitted the assessment of possible changes (a) in self-report data as a function of repeated measurements on these variables, and (b) in academic performance
as a result of providing such information.

**Experimenter**

The present investigator served as E in all treatment conditions. As program coordinator, he attended to all administrative and operational details of the study program, including acting as "study counselor" in each of the group-contact conditions. E was a 28-year-old oriental male who, as an advanced graduate student in clinical psychology, had received the equivalent of more than one full year of supervised clinical training as a counselor and therapist in both individual and group settings. Another characteristic of E of some relevance was that he was an alumnus of the school at which the study was conducted.

**Assessment Instruments**

Assessment of the dependent variables in the study took the form of both behavioral and paper-and-pencil measures.

**Behavioral Measures**

The behavioral measures employed in the study-improvement program included (a) behavioral frequency counts of studying and (b) quarterly grades in academic coursework. The primary dependent variable was the frequency of study behavior, which was measured directly through the continuous record-keeping of student-participants throughout the duration of the program. Corroborating dependent measures
included changes in academic performance from baseline to intervention as measured by improvement in course grades across quarters.

Paper-and-Pencil Measures

A variety of paper-and-pencil instruments were administered for the purpose of assessing a number of variables at pretreatment and posttreatment: (a) a pretreatment questionnaire (see Appendix G) to gauge such variables as estimated average weekly amount of study time during the preceding academic quarter, motivation to increase study and academic performance, and degree of self-control over studying; (b) a posttreatment questionnaire (see Appendix H) to tap such variables as degree of self-reported reliability in monitoring study time, extent of follow-through in application of study methods, and amount of contamination between treatment conditions; (c) the Survey of Study Habits and Attitudes, Form C (SSHA-C) (Brown & Holtzman, 1955) to evaluate changes in study habits and attitudes; (d) the Internal-External Locus of Control Scale (I-E Scale) (Rotter, 1966) to measure changes in perceived locus of control; (e) the Test Anxiety Scale (TAS) (Sarason, 1957) to assess changes in test-taking anxiety, (f) a version of the Semantic Differential (O'Donnell, 1973) (see Appendix I) to determine changes in cognitive and evaluative reactions to studying for exams; and (g) the Psychoticism, Extraversion, Neuroticism Questionnaire (PEN) (Eysenck & Eysenck, 1968) to assess scores on these dimensions at pretreatment.
CHAPTER VIII
RESULTS

The results of the study are presented in the following format. First, the statistical procedures for the analysis of the data are outlined in detail. Second, measures of sources of bias in the data are enumerated. Third, the principal findings of the experiment with respect to the main criterion variables of study rate and grade point are presented. Fourth, supplementary findings in connection with the secondary criterion variables of Ss' self-reports on a variety of paper-and-pencil measures are surveyed.

Procedures for Analysis of the Data

Experimental Design

The research design of the study represented a two-factor experiment with repeated measures on one factor. That is, types of treatment were completely crossed with periods of time, with Ss nested within treatments. Such a factorial experiment with repeated measures is commonly referred to as a mixed, or split-plot, design.

Analysis by Planned Comparisons

Since the present experiment was designed to answer a number of particular research questions which were asked before the data were collected, initially the data were analyzed by the a priori statistical method of planned comparisons. For each main dependent variable, planned
orthogonal comparisons among means were performed corresponding to those about which specific prior predictions had been made. Kirk's (1968) correction formula for planned comparisons of unequal numbers of Ss in experimental conditions was employed.

Once these comparisons of particular interest had been evaluated, the remainder of the data was examined through the use of a posteriori statistical procedures. That is, following data analysis by the method of planned comparisons, a corrected $F$ test of significance (Kirk, 1968) was performed in order to assess the residual sum of squares in the remainder of the data. Where the corrected $F$ ratio was significant, post-hoc comparisons were made on the differences between all possible remaining pairs of means, using the Newman-Keuls Test for the case of unequal number of Ss.

The combined use of both a priori and a posteriori procedures within the same experiment has been described by Kirk (1968, pp. 113-114).

With respect to the data on daily study rate, planned orthogonal comparisons were conducted on four particular combinations of means—corresponding to the following crucial research questions:

1. Is any form of treatment more effective than self-monitoring alone?

2. Is specific treatment consisting of self-monitoring, stimulus control, and contingency contracting more effective than nonspecific placebo treatment?

3. Is a combination of self-monitoring, stimulus control, and contingency contracting more effective than self-monitoring plus stimulus control?
4. Is a combination of self-administered and group-administered treatment more effective than self-administered treatment alone?

Refer to Table 3 for a summary of the set of four planned orthogonal comparisons selected in the analysis of the study time data.

<table>
<thead>
<tr>
<th>Table 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficients of Planned Orthogonal Comparisons on Study Rate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>1 0 0 0 0 0 0 -1 1/5 1/5 1/5 1/5</td>
</tr>
<tr>
<td>2 0 0 0 0 0 0 0 1/4 1/4 1/4 1/4 -1</td>
</tr>
<tr>
<td>3 0 0 0 0 0 0 0 -1/2 1/2 -1/2 1/2 0</td>
</tr>
<tr>
<td>4 0 0 0 0 0 0 0 -1/2 -1/2 1/2 1/2 0</td>
</tr>
</tbody>
</table>

In regard to the data on grade-point average, two other planned comparisons in addition to the previous four were done in order to provide answers to these additional questions:

1. Is participation in the program more effective than no participation?

2. Is any form of treatment more effective than no treatment?
The set of six planned orthogonal analyses employed in connection with the G.P.A. data is presented in Table 4.

Table 4

Coefficients of Planned Orthogonal Comparisons on Grade Point

<table>
<thead>
<tr>
<th>Treatment Means</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>1/6</td>
<td>1/6</td>
<td>1/6</td>
<td>1/6</td>
<td>1/6</td>
<td>1/6</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>-1</td>
<td>1/5</td>
<td>1/5</td>
<td>1/5</td>
<td>1/5</td>
<td>1/5</td>
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<td>0</td>
</tr>
<tr>
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<td>0</td>
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<tr>
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<td>1/2</td>
<td>-1/2</td>
<td>1/2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>-1/2</td>
<td>-1/2</td>
<td>1/2</td>
<td>1/2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Analysis of Covariance

Due to wide variability across Ss in their pretreatment levels on the primary criterion measures of daily study rate and quarterly grade point, steps were taken to reduce this source of variation through statistical control. An analysis of covariance was performed on both study rate and grade point data in an attempt to decrease the variability due to experimental error and to obtain unbiased estimates of treatment effects. Using baseline measures of daily study time as a covariate, the dependent variate of study time during each intervention
period was adjusted so as to remove the effects of Ss' initial scores on the concomitant variate. In a similar fashion, each S's grade-point average during baseline and intervention was statistically adjusted for his prebaseline G.P.A. level. This covariance adjustment served to statistically equate Ss' intervention scores on study rate and grade point for their respective pretreatment scores on these criterion measures.

Unequal Sample Sizes

Due to subject attrition, the resulting data consisted of unequal numbers of Ss in the different treatment conditions. These unequal sample sizes appeared not to have occurred for reasons completely independent of, or unrelated to, the experimental treatments. That is, the differential numbers of Ss remaining in each experimental condition may have been a function of the possible operation of biases in the nature of the various treatment conditions. In spite of this possibility, an analysis by unweighted means was used as an appropriate method of accommodating unequal sample sizes in the data.

Elimination of One Subject

A single S was eliminated from the data analysis due to an extreme baseline rate of studying. This S, a member of the contingency self-contracting group condition, exhibited an average study rate of 454 minutes per day during the 30 days of baseline. He represented an extreme observation in that the mean and standard deviation for the
baseline daily study rate of the S population to which he belonged was 93.1 and 53.9, respectively. Moreover, the mean baseline study rates of the two nearest participants in the program were 205 and 162 minutes per day. The use of a simple statistic for the detection of extremes in either direction, the range divided by the standard deviation of the population (Dixon & Massey, 1969), confirmed that the chances that this deviant value came from the population in question, assuming a normally distributed population, were statistically very small (p < .005). Aside from statistical justification for considering the S in question as coming from another population, from a practical standpoint a high school student studying an average of more than 7½ hours per day during baseline could hardly be said to need to enroll in a study-improvement program focusing on increased studying. Furthermore, he could not be expected reasonably to exceed that study rate, nor of course should he have been encouraged to do so. Unfortunately, the S's extreme baseline rate of studying went unnoticed until after intervention commenced.

Summary of Analysis Procedures

To summarize, the analysis of the data was conducted by means of a priori orthogonal comparisons in combination with a posteriori statistical procedures, using adjusted means obtained through analysis of covariance. All statistical analyses were conducted for the case of unequal n's, employing an unweighted means solution. A single individual with an extreme study rate during baseline was eliminated from the data analysis.
Measures of Data Bias

Subject Attrition

A clear-cut definition of attrition proved difficult in that a number of Ss continued to participate in the program—at least in terms of faithfully picking up their self-instructional manuals or regularly attending their group meetings—but turned in their study diaries on a sporadic basis. Inasmuch as self-reported data on study behavior constituted one of the principal dependent measures of the investigation, attrition was defined in terms of the turning in of study time data. The submittal of less than ten days of self-recorded study times during any treatment period constituted the criterion for classifying Ss as dropouts. This dropout criterion was based on the fact that ten days of study times constituted a representative (i.e., at least 25%) sampling of data points for each of the intervention periods, which ranged in duration from 30 to 39 days.

By this dropout criterion a total of 39, or 27.9%, of the 140 Ss participating in the study-improvement program failed to complete treatment. This rate of dropout constituted 41.9% of the 93 Ss who were assigned to some form of active treatment, including self-monitoring and placebo.

An analysis of attrition in terms of the number of dropouts from each of the experimental conditions revealed that the dropout rate ranged from 33.3% to 53.3% across treatments, with the lowest dropout rate associated with the contingency self-contracting group and the highest with the self-monitoring condition. A test of the equality of two proportions (Freund, Livermore, & Miller, 1960) showed that these
differences in the groups with the lowest and highest dropout rates did not approach statistical significance. Accordingly, there were also no reliable differences in attrition between any of the other treatment conditions. Refer to Table 5 for a breakdown of the differential attrition rates associated with the individual experimental conditions.

An analysis of dropouts by time periods showed that one (1.1%) participant dropped out of the study-improvement program during baseline, 15 (16.1%) during intervention I, and 23 (24.7%) during intervention II. Table 6 shows the differential breakdown of the number of dropouts from each experimental condition during each time period. The only reliable differences among treatment conditions in the point of the program at which attrition occurred were those found between self-monitoring versus stimulus-control manual (p < .01) and contingency-contracting group (p < .01) during intervention I, according to a test of the equality of two proportions. During this time period, six (40.0%) members of the self-monitoring condition terminated their involvement in the study program.

As a further test of the differential numbers of dropouts associated with treatment conditions, a $\chi^2$ test for k independent samples (Siegel, 1956) was performed on the dropout data. This nonparametric statistical procedure was designed to determine whether or not several independent samples could be regarded as having come from the same population or identical populations. Specifically, the $\chi^2$ test permitted an evaluation of the differential dropout rate associated with certain treatments, in order to decide whether the observed sample differences in frequencies or proportions of dropouts represented differences among
Table 5

Dropout Rate by Treatment Conditions

<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>Original n</th>
<th>Drops</th>
<th>Remaining n</th>
<th>Percent of Drops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Monitoring</td>
<td>15</td>
<td>8</td>
<td>7</td>
<td>53.3</td>
</tr>
<tr>
<td>Stimulus-Control Manual</td>
<td>16</td>
<td>7</td>
<td>9</td>
<td>43.8</td>
</tr>
<tr>
<td>Self-Contracting Manual</td>
<td>15</td>
<td>6</td>
<td>9</td>
<td>40.0</td>
</tr>
<tr>
<td>Stimulus-Control Group</td>
<td>16</td>
<td>7</td>
<td>9</td>
<td>43.8</td>
</tr>
<tr>
<td>Self-Contracting Group</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td>Placebo</td>
<td>16</td>
<td>6</td>
<td>10</td>
<td>37.5</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>39</td>
<td>54</td>
<td>41.9</td>
</tr>
<tr>
<td>Experimental Condition</td>
<td>Baseline</td>
<td>Intervention I</td>
<td>Intervention II</td>
<td>Total Dropouts</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-----------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>n</td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Self-Monitoring (n = 15)</td>
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<td>6</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>40.0</td>
<td>13.3</td>
<td>53.3</td>
</tr>
<tr>
<td>Stimulus-Control Manual (n = 16)</td>
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<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>6.3</td>
<td>37.5</td>
<td>43.8</td>
</tr>
<tr>
<td>Self-Contracting Manual (n = 15)</td>
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<td>3</td>
<td>6</td>
</tr>
<tr>
<td></td>
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<td>20.0</td>
<td>20.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Stimulus-Control Group (n = 16)</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>12.5</td>
<td>31.3</td>
<td>43.8</td>
</tr>
<tr>
<td>Self-Contracting Group (n = 15)</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>0.0</td>
<td>6.7</td>
<td>26.7</td>
<td>33.3</td>
</tr>
<tr>
<td>Placebo (n = 16)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>6.3</td>
<td>12.5</td>
<td>18.8</td>
<td>37.5</td>
</tr>
<tr>
<td>Total (n = 93)</td>
<td>1</td>
<td>15</td>
<td>23</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>1.1</td>
<td>16.1</td>
<td>24.7</td>
<td>41.9</td>
</tr>
</tbody>
</table>
populations or whether they were merely the chance variations expected among random samples from the same population. The appropriateness of the use of nonparametric statistics was suggested by the nature of the dropout measurement, which was inherently only classificatory (i.e., in a nominal scale) with frequencies in discrete categories constituting the data.

The results indicated that the probability associated with the occurrence of the obtained $X^2$ value of 1.45 did not approach the required .05 level of significance. Accordingly, the null hypothesis that the observed samples of dropout frequencies or proportions came from the same or identical populations could not be rejected. The rate of dropout from the study-improvement program thus appeared to be independent of membership in particular treatment conditions.

Reliability of Data

As a means of establishing the reliability of the self-recorded data on study rate, independent observations were conducted on the study behavior of a sample of those Ss who self-monitored their own study times. During the one-week period of independent monitoring by an external observer, observational data on studying in the library were collected for 32.3% of the students receiving some form of intervention for study improvement. These externally-monitored records of study times were compared with the corresponding entries in Ss' study diaries, yielding 70 observational trials which were in agreement and 16 trials which were not. Thus a check on the reliability of self-recorded study data resulted in an overall reliability coefficient of 81.4%.
In addition, as part of posttreatment assessment all program participants who engaged in the self-monitoring of their study behavior were asked to respond honestly in disclosing their degree of follow-through in self-recording their study times. Ss completed a posttreatment questionnaire (see Appendix H) which included the following three questions pertaining to their behavior of self-recording: (a) Did you record accurately and continuously all study times in your diary? (b) Did you forget to record any of your study times in your diary? (c) Did you record in your diary any study times in which you did not actually engage in studying?

On a scale of 1 through 5, with 1 corresponding to "never" and 5 to "always," the means and standard deviations of the ratings of Ss (n = 46) on each of these three questions were, respectively, 4.00 (S.D. = 0.67), 2.41 (S.D. = 0.86), and 1.57 (S.D. = 0.58). In addition, an analysis of variance on the responses for questions (a) and (c) indicated that there were no reliable differences among treatment groups in their degree of follow-through in self-recording operations. On the response of Ss to question (b), however, an analysis of variance revealed that the treatments did differ significantly overall in the extent to which Ss sometimes forgot to self-record their study times. Post-hoc analyses (Newman-Keuls) of the differences between treatment means showed that both the self-contracting group and the placebo condition were reliably less forgetful in their self-recording of study times than the stimulus-control manual condition (p < .05).
Reliability of Operations

At the time of posttreatment assessment, all program participants receiving any form of treatment except self-monitoring alone filled out a questionnaire (see Appendix H) on which they rated the extent to which they implemented the following treatment procedures: (a) self-recorded accurately and continuously all study times in their diary, (b) read all of the study manuals which were given to them, (c) actually applied the study methods suggested in the manuals, and (d) continued over time to apply the study methods suggested in manuals.

Ss indicated the degree to which they followed-through in carrying out these treatment operations by rating each of the above items on a 5-point scale, in which 1 = never, 2 = seldom, 3 = sometimes, 4 = most times, and 5 = always. The means and standard deviations of the ratings of Ss (n = 41) responding to the four items are presented in Table 7. A one-way analysis of variance revealed no significant differences among treatment groups in the extent to which Ss implemented each of the treatment procedures.

Table 7

<table>
<thead>
<tr>
<th>Treatment Procedures</th>
<th>n</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate and Continuous Self-Recording</td>
<td>46</td>
<td>4.00</td>
<td>0.67</td>
</tr>
<tr>
<td>Reading of Study Manuals</td>
<td>41</td>
<td>4.22</td>
<td>1.08</td>
</tr>
<tr>
<td>Application of Suggested Study Methods</td>
<td>41</td>
<td>3.66</td>
<td>0.88</td>
</tr>
<tr>
<td>Continuance of Application of Suggested Study Methods</td>
<td>41</td>
<td>3.39</td>
<td>0.97</td>
</tr>
</tbody>
</table>
Contamination of Treatment Conditions

As part of posttreatment assessment, all treated Ss were requested to indicate on a scale of 1 to 5 (see Appendix H) the extent to which they (a) read any of the study manuals given to their classmates participating in the program, and (b) discussed any of the study methods contained in the manuals with other participants in the program. The means and standard deviations of the responses of Ss (n = 42) to these questions were 1.26 (S.D. = 0.59) and 1.74 (S.D. = 1.01), respectively, with scores on the lower end of the continuum reflecting responses of "never" and "seldom." An analysis of variance on these scores indicated that there were no significant differences across any of the treatment groups in their self-reports on these measures.

Principal Findings

Study Rate

Ss in all experimental conditions with the exception of no-treatment controls self-monitored their studying behavior over three time periods--baseline, intervention I, and intervention II. The unadjusted and adjusted means and standard deviations of the study rate of each treatment condition during each time period are presented in Tables 8a and 8b, respectively. Study rates are expressed in minutes per day. A graphical comparison of the adjusted study-rate means of each of the treatment conditions across baseline and intervention periods may be found in Figure 1.
Table 8a
Means and Standard Deviations of Study Rate of Treatment Conditions Across Time Periods

<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>n</th>
<th>Baseline Mean</th>
<th>Baseline S.D.</th>
<th>Intervention I Mean</th>
<th>Intervention I S.D.</th>
<th>Intervention II Mean</th>
<th>Intervention II S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Monitoring</td>
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<td>60.4</td>
<td>25.5</td>
<td>57.1</td>
<td>29.8</td>
<td>60.7</td>
<td>50.9</td>
</tr>
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<td>Stimulus-Control Manual</td>
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<td>74.0</td>
<td>22.2</td>
<td>97.8</td>
<td>30.8</td>
<td>101.2</td>
<td>34.9</td>
</tr>
<tr>
<td>Self-Contracting Manual</td>
<td>9</td>
<td>104.0</td>
<td>37.0</td>
<td>112.3</td>
<td>60.1</td>
<td>119.0</td>
<td>59.5</td>
</tr>
<tr>
<td>Stimulus-Control Group</td>
<td>9</td>
<td>78.9</td>
<td>33.6</td>
<td>96.2</td>
<td>44.2</td>
<td>111.2</td>
<td>64.2</td>
</tr>
<tr>
<td>Self-Contracting Group</td>
<td>10</td>
<td>97.2</td>
<td>49.5</td>
<td>111.1</td>
<td>60.3</td>
<td>138.2</td>
<td>58.7</td>
</tr>
<tr>
<td>Placebo</td>
<td>10</td>
<td>83.4</td>
<td>40.9</td>
<td>115.7</td>
<td>62.3</td>
<td>138.0</td>
<td>93.4</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>84.1</td>
<td>37.3</td>
<td>100.5</td>
<td>51.5</td>
<td>114.3</td>
<td>65.2</td>
</tr>
<tr>
<td>Experimental Condition</td>
<td>n</td>
<td>Baseline</td>
<td>Intervention I</td>
<td>Intervention II</td>
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<tr>
<td>------------------------------</td>
<td>----</td>
<td>----------</td>
<td>----------------</td>
<td>-----------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Monitoring</td>
<td>7</td>
<td>85.2</td>
<td>88.8</td>
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<tr>
<td>Stimulus-Control Manual</td>
<td>9</td>
<td>109.8</td>
<td>113.2</td>
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<td>117.4</td>
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<td>95.5</td>
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<td>Placebo</td>
<td>10</td>
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<td></td>
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<tr>
<td>Total</td>
<td>54</td>
<td>99.7</td>
<td>112.7</td>
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</tr>
</tbody>
</table>

Table 8b
Adjusting Means of Study Rate of Treatment
Conditions across Time Periods
FIGURE 1

Adjusted Mean Study Rate of Treatment Conditions across Time Periods
Planned Comparisons

Planned orthogonal comparisons with respect to study rate were performed on the following series of four specific combinations of treatment means: (a) stimulus-control manual plus contingency-contracting manual plus stimulus-control group plus contingency-contracting group plus placebo versus self-monitoring; (b) stimulus-control manual plus contingency-contracting manual plus stimulus-control group plus contingency-contracting group versus placebo; (c) contingency-contracting manual plus contingency-contracting group versus stimulus-control manual plus stimulus-control group; and (d) stimulus-control group plus contingency-contracting group versus stimulus-control manual plus contingency-contracting manual.

These orthogonal analyses by planned comparisons indicated that of the four differences between combinations of means evaluated, two reached statistical significance. First, the data analyses showed that, as predicted, any form of treatment—consisting of more than self-monitoring, regardless as to whether it was specific or nonspecific—proved significantly more effective than self-monitoring alone (a form of no treatment) in increasing study rate, $F = 6.66, \text{df} = 1,48, p < .025$. In addition, the combined effects of specific treatment consisting of stimulus control, with or without contingency contracting and with or without groups, were reliably different from those of nonspecific placebo treatment, though not in the direction hypothesized, with placebo group treatment proving significantly more effective in increasing study time, $F = 7.43, \text{df} = 1,48, p < .01$. Third, the planned comparisons analyses showed that there was no reliable difference
in the combined treatment mean of contingency contracting, both manual and group conditions, as contrasted with that of stimulus control, both manual and group. Finally, comparison of the difference between the combination of means of self-administered plus group-administered treatment versus self-administered treatment alone indicated that this difference approached statistical significance, \( F = 3.03, \) \( df = 1,48, \) \( p < .10, \) in the predicted direction.

The \( F \) test on the sum of squares remaining after the four planned comparisons yielded an \( F \) ratio that was not significant. Accordingly, post-hoc analyses in the form of multiple comparisons were not performed on the residual variance.

Individual T-Tests

Individual (i.e., \( n = 1 \)) t-tests were performed, comparing each \( S \)'s daily study rate across each of the three time periods. These t-tests were conducted to determine whether any \( S \) exhibited a significant improvement in average daily study rate from (a) baseline to intervention I, (b) intervention I to intervention II, and (c) baseline to intervention II. Since many \( S \)s evidenced considerable within-subject variability in their daily studying, two sets of t-tests were run, one assuming equal variance and the other assuming unequal variance.

A summary of the results of these t-tests on each individual \( S \)'s daily study time is presented in Table 9. Of a total 54 \( S \)s for whom study time data were available, 12 (22.2%) students significantly increased their daily study average from baseline to intervention I, 11 (20.4%) students from intervention I to intervention II, and 19 (35.2%) students from baseline to intervention II. Altogether, three (5.6%)
<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>Baseline to Intervention I</th>
<th>Intervention I</th>
<th>Baseline to Intervention II</th>
<th>Intervention II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Self-Monitoring (n = 7)</td>
<td>1</td>
<td>14.3</td>
<td>1</td>
<td>14.3</td>
</tr>
<tr>
<td>Stimulus-Control Manual (n = 9)</td>
<td>3</td>
<td>33.3</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>Self-Contracting Manual (n = 9)</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>Stimulus-Control Group (n = 9)</td>
<td>3</td>
<td>33.3</td>
<td>2</td>
<td>22.2</td>
</tr>
<tr>
<td>Self-Contracting Group (n = 10)</td>
<td>1</td>
<td>10.0</td>
<td>3</td>
<td>30.0</td>
</tr>
<tr>
<td>Placebo (n = 10)</td>
<td>4</td>
<td>40.0</td>
<td>3</td>
<td>30.0</td>
</tr>
<tr>
<td>Total (n = 54)</td>
<td>12</td>
<td>22.2</td>
<td>11</td>
<td>20.4</td>
</tr>
</tbody>
</table>
students significantly decreased their average daily studying, two $S$s between intervention I and intervention II and one $S$ between baseline and intervention II.

Table 9 also provides a breakdown of the number of students demonstrating significant study improvement by treatment conditions. In individual t-tests of study increments shown during the most crucial time period—from baseline to intervention II—the stimulus-control group condition showed the greatest proportion of improved students, with five (55.6%) such students exhibiting significant increases in studying. The stimulus-control manual, contingency-contracting group and placebo-group conditions each evidenced four improved students, whereas the self-monitoring and contingency-contracting manual conditions showed one student apiece displaying significant improvements in studying between baseline and intervention II.

A test of the difference between the condition (stimulus-control group) exhibiting the largest proportion (55.6%) of improved students and that condition (contingency-contracting manual) displaying the smallest proportion (11.1%), using a test of the equality of two proportions (Freund, Livermore, & Miller, 1960), attained statistical significance, $Z = 2.00, \ p < .01$. The difference between the proportion of improved $S$s of the former group in relation to that of the condition exhibiting the second smallest proportion (14.3%), the self-monitoring condition, also proved reliable, $Z = 1.69, \ p < .05$. None of the other differences between any pairs of proportions were significant.
Analysis of Improved Versus Unimproved Subjects

All Ss for whom data on daily study time were available were categorized into two groups—those who exhibited significant improvement and those who did not exhibit significant improvement—as defined by the results of individual (i.e., n of 1) t-tests on changes in study rate from baseline to intervention II. According to this criterion, a total of 19 or 35.2% of the students with study data evidenced significant (at the .05 level) increases in average daily study rate during this time period. This group of improved students (n = 19) was contrasted with the remaining group of unimproved students (n = 35), collapsing across all treatment conditions. The initial scores of these two groups of Ss on a wide range of subject variables served as the basis of comparison.

Table 10 contains a summary of the results of t-tests between the improved and unimproved groups of Ss on 25 subject characteristics. These t-tests indicated that none of the differences between the compared groups on any variable attained statistical significance at the .05 level. However, it is noteworthy that the groups were different from each other at the .10 level of significance on two measures: Internal-External Locus of Control (p < .08) and self-reported degree of self-control over studying behavior (p < .07).

The means and standard deviations of the improved and unimproved groups on the I-E Scale were 11.26 (S.D. = 3.5) and 9.69 (S.D. = 2.90), respectively, with scores in the lower direction signifying a strong belief in one's self-control over studying.
Table 10

T-Tests Between Improved and Unimproved Groups
on Subject Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>T-Value</th>
<th>2-Tailed Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Daily Study Time</td>
<td>-0.28</td>
<td>0.78</td>
</tr>
<tr>
<td>Prebaseline Grade-Point Average</td>
<td>-1.49</td>
<td>0.14</td>
</tr>
<tr>
<td>Baseline Grade-Point Average</td>
<td>0.05</td>
<td>0.96</td>
</tr>
<tr>
<td>Intervention Grade-Point Average</td>
<td>-1.37</td>
<td>0.18</td>
</tr>
<tr>
<td>Survey of Study Habits and Attitudes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay Avoidance</td>
<td>-1.11</td>
<td>0.27</td>
</tr>
<tr>
<td>Work Methods</td>
<td>-0.02</td>
<td>0.99+</td>
</tr>
<tr>
<td>Teacher Attitude</td>
<td>1.28</td>
<td>0.21</td>
</tr>
<tr>
<td>Education Acceptance</td>
<td>0.04</td>
<td>0.97</td>
</tr>
<tr>
<td>Study Habits</td>
<td>-0.65</td>
<td>0.52</td>
</tr>
<tr>
<td>Study Attitude</td>
<td>0.65</td>
<td>0.52+</td>
</tr>
<tr>
<td>Study Orientation</td>
<td>0.06</td>
<td>0.95+</td>
</tr>
<tr>
<td>Internal-External Locus of Control</td>
<td>-1.77</td>
<td>0.08*</td>
</tr>
<tr>
<td>Test Anxiety Scale</td>
<td>-0.67</td>
<td>0.51</td>
</tr>
<tr>
<td>Semantic Differential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluative</td>
<td>-0.63</td>
<td>0.53</td>
</tr>
<tr>
<td>Cognitive</td>
<td>-0.85</td>
<td>0.41+</td>
</tr>
</tbody>
</table>

* These t-values were based on separate variance estimates rather than pooled variance estimates.

* p < .10

(Table continued on next page)
Table 10, Continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>T-Value</th>
<th>2-Tailed Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychoticism-Extraversion-Neuroticism</td>
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<td></td>
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<tr>
<td>Psychoticism</td>
<td>-0.93</td>
<td>0.36</td>
</tr>
<tr>
<td>Extraversion</td>
<td>1.33</td>
<td>0.19</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-0.20</td>
<td>0.84</td>
</tr>
<tr>
<td>Lie</td>
<td>0.13</td>
<td>0.89</td>
</tr>
<tr>
<td>Motivation to Improve Studying</td>
<td>0.19</td>
<td>0.85</td>
</tr>
<tr>
<td>Self-Control over Studying Behavior</td>
<td>1.85</td>
<td>0.07*</td>
</tr>
<tr>
<td>Desire to Increase Studying</td>
<td>0.07</td>
<td>0.95</td>
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<tr>
<td>Study Anxiety</td>
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<td>0.70†</td>
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<tr>
<td>Kulman-Anderson IQ</td>
<td>-0.79</td>
<td>0.43</td>
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<tr>
<td>Grade-Level</td>
<td>0.49</td>
<td>0.63</td>
</tr>
</tbody>
</table>

† These t-values were based on separate variance estimates rather than pooled variance estimates.

* p < .10
Grade-Point Average

Data on grade-point average were obtained for all eight experimental conditions across three periods--prebaseline, baseline, and intervention--corresponding to the first three quarters of the academic school year, using the first-quarter prebaseline G.P.A. as a covariate. The unadjusted and adjusted means and standard deviations of the G.P.A. of Ss in each treatment across baseline and intervention periods are found in Tables Ila and Ilb. A comparison of the adjusted mean study rates for each of the experimental conditions across time periods is graphically depicted in Figure 2.

Planned Comparisons

In addition to the set of four combinations of treatment means already described in relation to study rate, two other specific combinations of means constituted the basis of the planned orthogonal comparisons on grade-point average, as follows: (a) self-monitoring plus stimulus-control manual plus contingency-contracting manual plus stimulus-control group plus contingency-contracting group plus placebo plus no-treatment interested versus no-treatment uninterested; and (b) self-monitoring plus stimulus-control manual plus contingency-contracting manual plus stimulus-control group plus contingency-contracting group plus placebo versus no-treatment interested.

These orthogonal comparisons analyses of grades yielded significant F ratios for two of the six comparisons between combinations of treatment means. On the first comparison, as predicted, evaluation of the effects of participation versus no participation in the program
Table 11a
Means and Standard Deviations of G.P.A. of Experimental Conditions across Time Periods

<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>n</th>
<th>Prebaseline Mean</th>
<th>Prebaseline S.D.</th>
<th>Baseline Mean</th>
<th>Baseline S.D.</th>
<th>Intervention Mean</th>
<th>Intervention S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Monitoring</td>
<td>7</td>
<td>2.59</td>
<td>0.43</td>
<td>2.69</td>
<td>0.43</td>
<td>2.86</td>
<td>0.50</td>
</tr>
<tr>
<td>Stimulus-Control Manual</td>
<td>9</td>
<td>2.57</td>
<td>0.58</td>
<td>2.62</td>
<td>0.46</td>
<td>2.79</td>
<td>0.53</td>
</tr>
<tr>
<td>Self-Contracting Manual</td>
<td>9</td>
<td>2.70</td>
<td>0.47</td>
<td>2.88</td>
<td>0.69</td>
<td>2.80</td>
<td>0.72</td>
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<tr>
<td>Stimulus-Control Group</td>
<td>9</td>
<td>2.54</td>
<td>0.58</td>
<td>2.64</td>
<td>0.52</td>
<td>2.77</td>
<td>0.58</td>
</tr>
<tr>
<td>Self-Contracting Group</td>
<td>10</td>
<td>2.56</td>
<td>0.31</td>
<td>2.71</td>
<td>0.30</td>
<td>2.88</td>
<td>0.35</td>
</tr>
<tr>
<td>Placebo</td>
<td>10</td>
<td>2.73</td>
<td>0.44</td>
<td>2.86</td>
<td>0.61</td>
<td>2.85</td>
<td>0.44</td>
</tr>
<tr>
<td>No-Treatment: Interested</td>
<td>22</td>
<td>2.80</td>
<td>0.55</td>
<td>2.80</td>
<td>0.48</td>
<td>2.77</td>
<td>0.57</td>
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<tr>
<td>No-Treatment: Uninterested</td>
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<td>3.05</td>
<td>0.52</td>
<td>3.02</td>
<td>0.63</td>
</tr>
<tr>
<td>Total</td>
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<td>2.78</td>
<td>0.53</td>
<td>2.83</td>
<td>0.51</td>
<td>2.86</td>
<td>0.55</td>
</tr>
<tr>
<td>Experimental Condition</td>
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<td>Baseline</td>
<td>Intervention</td>
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<td>--------------------------</td>
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<td>-------------</td>
<td>----------</td>
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<tr>
<td>Self-Monitoring</td>
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<td>2.83</td>
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<td>Stimulus-Control Manual</td>
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<td>2.78</td>
<td></td>
<td>2.95</td>
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<tr>
<td>Self-Contracting Manual</td>
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<td>2.94</td>
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<td>2.86</td>
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<tr>
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<td>2.95</td>
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<td>Self-Contracting Group</td>
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<td>2.88</td>
<td></td>
<td>3.05</td>
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<td></td>
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<td>2.89</td>
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<td></td>
<td></td>
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<tr>
<td>No-Treatment: Interested</td>
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<td>2.78</td>
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<td>2.75</td>
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<td></td>
<td></td>
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<tr>
<td>No-Treatment: Uninterested</td>
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<td>2.80</td>
<td></td>
<td>2.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>2.84</td>
<td></td>
<td>2.90</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
FIGURE 2

Adjusted Grade-Point Average of Experimental Conditions across Time Periods
showed that program participation resulted in significantly greater improvement in grades than no such participation, $F = 6.53$, $df = 1,93$, $p < .025$. On the second comparison, the data analyses indicated that any active form of treatment, irrespective of its nature, was significantly more effective than no treatment in improving grade-point average, $F = 9.68$, $df = 1,93$, $p < .01$. However, there was no significant difference in grades between the combined means of all forms of active treatment and that of self-monitoring alone. Fourth, the combined effects on grades of specific treatment consisting of stimulus control (both manual and group conditions) and contingency contracting (both manual and group conditions) were not significantly greater than the treatment effects of the nonspecific placebo group. In addition, a combination of contingency contracting, both with and without groups, proved no more effective than stimulus control, both with and without groups, in improving grade-point average. Sixth, there were no reliable differences in the means of self-administered and group-administered treatment combined in relation to self-administered treatment alone in improving academic performance as measured by grades.

When the residual variances were pooled and evaluated, they gave rise to an $F$ value that did not attain statistical significance. Therefore, no post hoc multiple comparisons were done on the pooled residual sum of squares.

Correlation between Study Rate and Grade Point

A central focus of the present investigation was the nature of the relationship between daily average study rate and quarterly grade-
point average. The correlation between studying and academic performance was based on all program participants for whom study data were available. This was done by adjusting (a) each S's posttreatment (i.e., intervention II) average daily study rate for his corresponding pretreatment (i.e., baseline) study rate, and (b) each student's posttreatment (i.e., intervention) quarterly grade-point average for his corresponding pretreatment (i.e., prebaseline) G.P.A. These two sets of adjusted scores were correlated by means of the use of Pearson product-moment coefficients with Lacey (1956) adjustments. The resultant overall correlation between adjusted daily study time and adjusted quarterly grade point for the period of intervention was 0.11, which did not approach statistical significance.

Additional data bearing on this issue took the form of t-tests between those groups of Ss who reliably improved and those who did not significantly improve, as defined by the results of individual t-tests on study time data, for change in G.P.A. from prebaseline to intervention. A t-test between the improved and unimproved groups on this variable indicated that the differences in the two groups did not come close to approaching statistical significance ($p < 0.97$) for G.P.A. change from prebaseline to intervention. The lack of a corresponding increase in G.P.A. for the group of students who significantly increased their study output from prebaseline to intervention indicates a modest overall correlation between study time and grade point.
Supplementary Findings

In addition to the primary criterion variables of daily study rate and grade-point average, a number of other dependent variables were investigated. These secondary measures assumed the form of (a) pre- and posttreatment change scores on paper-and-pencil instruments and (b) self-evaluation of treatment by Ss at the conclusion of the program. Whereas the data on study time and grade point were designated for analyses by a priori statistical procedures, the additional self-report measures were submitted to analyses of variance with the aim of obtaining significant overall F ratios with which to conduct multiple comparisons between treatment means by way of post-hoc methods of data analyses.

Change on Paper-and-Pencil Instruments

The results with respect to change between pretest and posttest on each of the paper-and-pencil measures are presented first. Because of the failure of a number of Ss to complete the posttest of some of these paper-and-pencil instruments, the analyses of these variables suffered from reduced n's. The number (and percent) of Ss for whom there were both pre- and posttreatment scores available for each of the four criterion measures are enumerated, as follows: (a) Survey of Study Habits and Attitudes: n = 71 (70.3%), (b) Internal-External Locus of Control: n = 72 (71.3%), (c) Test Anxiety Scale: n = 73 (72.3%), and (d) Semantic Differential: n = 73 (72.3%).
Survey of Study Habits and Attitudes

A series of two-way (treatment x trial) analyses of variance were conducted on the two major scales of the SSHA, as summarized in Tables 12a and 12b. While these analyses showed no significant differences on either treatments or trials for the study habits scale, they revealed significant main effects on trials on the study attitudes scale \( (p < .03) \). In line with these findings, there were no significant F ratios for either of the subscales of the study habits scale—delay avoidance and work methods. With respect to the two subscales of the study attitudes scale—teacher acceptance and education acceptance—significant trial effects emerged on the former \( (p < .03) \) but not on the latter. Thus it appears that as a result of participation in the study-improvement program, the experimental conditions as a whole exhibited self-reported improvements in some of their study attitudes, though not in their corresponding study habits.

Internal-External Locus of Control

A two-way analysis of variance was performed on the pre- and posttreatment scores on the I-E Scale to determine whether or not there were any treatment, trial, or treatment x trial effects on this measure. The summary table for this ANOVA may be found in Table 13. There were no significant F ratios, indicating that there were no changes in Ss' I-E score as a function of either treatment conditions or time periods.
Table 12a

Two-Way Analysis of Variance:
Effect of Treatment and Trial on SSHA--Study Habits Scale

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>2749.35</td>
<td>7</td>
<td>392.76</td>
<td>0.72</td>
</tr>
<tr>
<td>Error</td>
<td>34310.78</td>
<td>63</td>
<td>544.62</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial</td>
<td>83.25</td>
<td>1</td>
<td>83.25</td>
<td>1.15</td>
</tr>
<tr>
<td>Interaction</td>
<td>435.39</td>
<td>7</td>
<td>62.20</td>
<td>0.86</td>
</tr>
<tr>
<td>Error</td>
<td>4576.28</td>
<td>63</td>
<td>72.64</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41799.49</td>
<td>141</td>
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</tbody>
</table>
### Table 12b

Two-Way Analysis of Variance:

Effect of Treatment and Trial on SSHA--Study Attitudes Scale

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
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<tbody>
<tr>
<td>Between</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>3305.07</td>
<td>7</td>
<td>472.15</td>
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</tr>
<tr>
<td>Error</td>
<td>35556.59</td>
<td>63</td>
<td>564.39</td>
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</tr>
<tr>
<td>Within</td>
<td>5531.00</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial</td>
<td>364.05</td>
<td>1</td>
<td>364.05</td>
<td>4.92*</td>
</tr>
<tr>
<td>Interaction</td>
<td>490.36</td>
<td>7</td>
<td>70.05</td>
<td>0.95</td>
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<tr>
<td>Error</td>
<td>4657.19</td>
<td>63</td>
<td>73.92</td>
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</tr>
<tr>
<td>Total</td>
<td>44662.87</td>
<td>141</td>
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<td></td>
</tr>
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</table>

* p < .05
Table 13

Two-Way Analysis of Variance:
Effect of Treatment and Trial on I-E Scale

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
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</thead>
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<tr>
<td>Between</td>
<td>1539.31</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>181.73</td>
<td>7</td>
<td>25.96</td>
<td>1.24</td>
</tr>
<tr>
<td>Error</td>
<td>1341.55</td>
<td>64</td>
<td>20.96</td>
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</tr>
<tr>
<td>Within</td>
<td>424.00</td>
<td>72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial</td>
<td>14.68</td>
<td>1</td>
<td>14.68</td>
<td>2.57</td>
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<tr>
<td>Interaction</td>
<td>44.04</td>
<td>7</td>
<td>6.29</td>
<td>1.10</td>
</tr>
<tr>
<td>Error</td>
<td>365.77</td>
<td>64</td>
<td>5.72</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1963.31</td>
<td>143</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Test Anxiety Scale

A treatment x trial analysis of variance on the scores of Ss on the TAS revealed significant interaction effects (p < .02) and main effects on trials (p < .005). Refer to Table 14 for a summary of this ANOVA. Post-hoc analyses involving multiple comparisons between interaction means showed that the significant differences reflected in the overall F ratio involved the large change in the TAS score of a single experimental condition, the self-monitoring group. Inasmuch as this particular treatment condition had a cell n of only five Ss, due to the failure of many Ss in this group to complete the posttest, it is likely that the emergence of significant overall group differences is an artifact of this condition. In view of this possibility, the reporting of differences between pairs of treatments on the TAS was not deemed appropriate.

Semantic Differential

An analysis of variance (see Table 15a) on the evaluative scale of the Semantic Differential indicated a significant main effect on trials (p < .05). As a function of program participation, Ss as a whole significantly reduced their emotive evaluation (i.e., feeling) of the anxiety or discomfort associated with the situation of studying in preparation for exams.

An analysis of variance (see Table 15b) on the cognitive scale of the Semantic Differential also showed significant trial effects (p < .02), indicating that there was a significant decrease from pretreatment to posttreatment in Ss' cognitive attitude (i.e., thinking)
Table 14

Two-Way Analysis of Variance:

Effect of Treatment and Trial on TAS

<table>
<thead>
<tr>
<th>Source</th>
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</thead>
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<td>Between</td>
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<td>Treatment</td>
<td>650.20</td>
<td>7</td>
<td>92.89</td>
<td>1.19</td>
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<tr>
<td>Error</td>
<td>5084.36</td>
<td>65</td>
<td>78.22</td>
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</tr>
<tr>
<td>Within</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Trial</td>
<td>133.50</td>
<td>1</td>
<td>133.50</td>
<td>8.59***</td>
</tr>
<tr>
<td>Interaction</td>
<td>294.82</td>
<td>7</td>
<td>42.12</td>
<td>2.71**</td>
</tr>
<tr>
<td>Error</td>
<td>1009.87</td>
<td>65</td>
<td>15.54</td>
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</tr>
<tr>
<td>Total</td>
<td>7076.58</td>
<td>145</td>
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</tr>
</tbody>
</table>

** p < .025

*** p < .005
### Table 15a

**Two-Way Analysis of Variance:**

**Effect of Treatment and Trial on SD—Evaluative Scale**

<table>
<thead>
<tr>
<th>Source</th>
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<th>Mean Square</th>
<th>F</th>
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<tr>
<td>Treatment</td>
<td>454.73</td>
<td>7</td>
<td>64.96</td>
<td>0.60</td>
</tr>
<tr>
<td>Error</td>
<td>7017.49</td>
<td>65</td>
<td>107.96</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial</td>
<td>112.59</td>
<td>1</td>
<td>112.59</td>
<td>4.02*</td>
</tr>
<tr>
<td>Interaction</td>
<td>384.51</td>
<td>7</td>
<td>54.93</td>
<td>1.96</td>
</tr>
<tr>
<td>Error</td>
<td>1820.83</td>
<td>65</td>
<td>28.01</td>
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</tr>
<tr>
<td>Total</td>
<td>9840.55</td>
<td>145</td>
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</tr>
</tbody>
</table>

* p < .05
Table 15b

Two-Way Analysis of Variance:

Effect of Treatment and Trial on SD--Cognitive Scale

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
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<th>F</th>
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</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>5449.74</td>
<td>72</td>
<td>52.94</td>
<td>0.67</td>
</tr>
<tr>
<td>Error</td>
<td>5104.75</td>
<td>65</td>
<td>78.53</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>1819.50</td>
<td>73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial</td>
<td>130.55</td>
<td>1</td>
<td>130.55</td>
<td>5.75**</td>
</tr>
<tr>
<td>Interaction</td>
<td>223.53</td>
<td>7</td>
<td>31.93</td>
<td>1.41</td>
</tr>
<tr>
<td>Error</td>
<td>1474.60</td>
<td>65</td>
<td>22.69</td>
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</tr>
<tr>
<td>Total</td>
<td>7269.24</td>
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</tr>
</tbody>
</table>

**p < .025
regarding the importance or meaningfulness of studying in relation to preparation for tests.

Self-Evaluation of Treatment by Subjects

At the termination of the study-improvement program, each $S$ exposed to treatment was asked to complete a posttreatment questionnaire (see Appendix H) on which he rated, on a scale from 1 to 5, (a) how much he had found the material in the study manuals relevant to his needs as a student, and (b) how much he had benefited from participation in the program. In both instances, the higher end of the rating continuum indicated the more positive evaluation. The means and standard deviations of the responses of the sample of 45 (83.3%) treated $S$s responding to these two questions were 3.29 (S.D. = 0.94) and 3.42 (S.D. = 0.78), respectively. A one-way analysis of variance on scores for the first question (i.e., how relevant the program was) yielded no significant differences between treatment conditions; analysis of the second question (i.e., how helpful the program was) also revealed no significant differences among groups.

Summary of Results

In summary, using a two-factor (treatment x trial) design with repeated measures on one factor, the relative therapeutic contributions of stimulus control and contingency contracting were compared within the context of either self-administered or group-administered treatment.
The combined application of *a priori* and *a posteriori* methods of statistical analyses within the same experiment revealed no significant differential outcomes associated with various combinations of behavioral treatment, on any of the principal and secondary measures of study rate, grade point, change on paper-and-pencil instruments, and self-evaluation of treatment by Ss. Specifically, a comparison of the treatment effects of stimulus control versus stimulus control plus contingency contracting revealed no differential outcomes in either study time or grade point. There were also no reliable differences between the intervention effects of self-administered and group-administered treatment, although the superiority of group treatment in producing larger study rates than self-treatment approached statistical significance.

Reliable differences in treatment effects were found, however, between treatments and controls on study rate and grade point, but not on any of the self-report measures. The results indicated that a form of active intervention, irrespective of its specificity or nonspecificity, was significantly more effective than self-monitoring control in increasing study rate, and significantly more successful than no-treatment control in improving grade point. It was also found, however, that nonspecific placebo treatment was reliably more effective than a combination of specific treatment in producing increments in studying, though not in corresponding grades.

In addition, n of one t-tests on each individual's daily study rate across time periods indicated that 19 (35.2%) out of 54 Ss exhibited significant improvements in study time. When this group of improved students was contrasted by means of t-tests with the remaining group of
unimproved students on two-dozen assorted variables, only two of them--I-E Scale and self-reported self-control over studying--approached statistical significance.
CHAPTER IX
DISCUSSION

The present chapter interprets and discusses the results of the study. The format parallels closely the outline of the previous chapter, in that each major topic in the presentation of results has a corresponding focus of discussion included herein. First, the results in relation to dropouts are addressed; second, the principal findings of the investigation with respect to studying and grades are interpreted; third, the supplementary findings in regard to self-report measures are discussed; and fourth, the possible sources of bias in the experiment are elucidated.

Dropouts

One of the most important findings of the study is the rather large attrition rate associated with the present approach to the self-improvement of studying, with as many as 27.9% of the 140 students participating in the program dropping out. There were no significant differences among treatments in dropout rate, although the self-monitoring condition had more dropouts than any of the other groups. Specifically, the self-monitoring condition suffered from a severe attrition rate of 53.3%. Furthermore, there were generally no reliable differences between experimental conditions in the period of the program at which attrition occurred, with the exception of the dropout rate of the self-monitoring condition during intervention I which was significantly greater than that of stimulus-control manual and self-contracting group.
Hence students who were instructed only to self-record their study times tended to leave the program after six weeks.

The additional finding that there were no differences in attrition between self-instructional and group-contact conditions indicates that group treatment made no contribution in keeping participants in the study-improvement program. Inasmuch as 41.9% and 38.7% of the students in self- and group-administered conditions, respectively, did not complete the program, these treatment modes did not differ much from each other in terms of their success in sustaining the interest of participants. These results suggest that group-administered treatment failed to increase the participation of students beyond the level provided by self-administered treatment alone.

Interpretation of Principal Findings

Studying

Differential Effects of Treatment

The results of the investigation indicate that a form of active treatment is significantly more effective than self-monitoring alone in enhancing average daily study rate. These findings obtained regardless as to whether or not intervention took the form of specific or nonspecific treatment. Thus participants in the present study-improvement endeavor did not reliably improve their rate of studying through the application of self-recording operations alone.

Another important finding of the study is that nonspecific treatment proved significantly more effective in producing increased
study rate than a combination of specific treatments, comprised of stimulus control—with and without contingency contracting as well as with and without group contact. It is possible that the operation of placebo factors such as attention, expectancy, and demand characteristics may be responsible for a large part of the treatment effects.

A comparison of the differential treatment effects of stimulus control plus self-contracting versus stimulus control showed no reliable differences between these two conditions. Thus it appears that no contribution to treatment effectiveness is afforded by the addition of self-contracting in attempts to increase study output.

Finally, no reliable differences emerged between self-treatment and group treatment in increasing study rate, though there was a trend in the data that approached statistical significance within the .10 level. The superiority of group treatment over self-treatment is not clear-cut, due in part to the considerable error variance—both within-subject and between-subject—associated with daily study rate that served to mask treatment effects to some extent. It remains questionable whether supplementing the use of self-instructional manual with group contact offers a substantial contribution to self-treatment. On the face of it, the findings of a trend in the data provide only moderate experimental support for the combined application of self- and group-administered treatment modalities.

Individual Improvement in Study Rate

Altogether, 35.2% of those students for whom study data were available displayed significant increments in daily average studying
from baseline to intervention II, as determined by individual t-tests on study rate across time periods. On the other hand, only a single program participant exhibited a reliable decrement from baseline to intervention II in daily studying average. The finding that only about a third of the program participants significantly increased their study rate from pre- to posttreatment, according to individual t-tests across time periods, indicates that the program achieved limited success in enhancing study output. A casual examination of the study data shows that in fact a large majority of students substantially increased their studying; these increments in study time, however, were obscured somewhat by the large within-subject error variance associated with daily study rate as a dependent measure.

It is worth noting that the largest proportion of students showing significant study improvement from pre- to posttreatment was evidenced by the stimulus-control group (55.6%), followed by stimulus-control manual (44.4%), contingency-contracting group (40.0%), and placebo-group condition (40.0%). The only significant differences in proportion of improved students were between stimulus-control group versus contingency-contracting manual (11.1%) and self-monitoring control (14.3%).

Thus in terms of the number of students showing significant gains in study rate, all treatments with the exception of contingency-contracting manual and self-monitoring demonstrated moderate success. The failure of the use of the self-contracting manual may be attributed possibly to the complexity involved in applying self-contracting procedures learned via self-instruction alone. In line with the findings of no change across trials in the group means of the self-monitoring
condition, only one member of this group showed a significant study increment. This finding adds further support to the conclusion that self-monitoring of study behavior does not itself bring about increased studying, at least with the student population in question.

Improved Versus Unimproved Subjects

Those individuals who successfully increased their studying, as documented by n of one t-tests across time periods, were contrasted with those students who did not increase their study rate. The direct comparison of these two groups of improved and unimproved students on a wide range of measures represented an attempt to elucidate some of the process variables associated with improved studying.

The t-tests indicated that there were no reliable differences at the .05 level of statistical significance between the improved and unimproved groups on any of more than two-dozen measures. However, two variables did emerge on which the groups were different within the .10 level of significance; these findings should be interpreted with caution, as two significant t-values at the .10 level are what would be expected by chance alone. These factors—score on Internal-External Locus of Control and self-reported degree of self-control over studying—loom as possible predictor variables in attempts at self-improvement of studying. Not unexpectedly, these factors are closely related to one another in that they seem to tap essentially the same thing: the individual's attribution of the causes of his behavior to himself (internal orientation) rather than to events outside of himself (external orientation), along with a personal belief in his capacity
to exert internal or self-control over his own behavior.

The findings of a possible trend in the data linking an orientation of internal or self-control with successful attempts at study improvement merit further examination. It may be that individuals who perceive events in their lives as caused by their own actions respond more receptively to a program of behavioral self-control than persons who attribute their behavior to forces outside of themselves. That is, "internal" students may be more likely to improve in their study and academic performance as a function of program participation than "external" students. The research findings that internally-controlled Ss, as measured by the I-E Scale, are generally more successful in controlling their problem behavior of smoking (e.g., Marston & McFall, 1972; Steffy, Meichenbaum, & Best, 1970) offer some experimental support for this hypothesis. Thus the results of the present investigation may be interpreted as lending moderate support for the supposition that the internally-oriented individual is more likely than the externally-oriented person to be receptive to the use of self-control methods for study improvement and to follow-through in the application of same. If further research provides additional empirical basis for this assumption, the administration of the I-E Scale may serve as a clinical predictor of students likely to attain success with study self-improvement techniques. Moreover, it is conceivable that the same purpose may be served by simply asking students the degree to which they perceive that they have self-control over their studying.

Comparison of improved and unimproved students on assorted variables via t-tests served to determine which subject characteristics,
if any, influenced the effects of the independent (treatment) variables. In addition to internal-external locus of control, six other subject characteristics in particular--grade-level, past academic performance, test anxiety, IQ, motivation to improve studying, and desire to increase studying--were expected to interact with treatment effects. The results of the t-tests on these subject variables indicate, however, that none was associated in a significant way with treatment outcome. Two of these subject characteristics, grade-level and past academic performance, deserve special comment.

The grade-level of Ss was expected to act as an important subject characteristic affecting treatment outcome. Ss were assigned randomly to experimental conditions in six homogeneous blocks on the basis of grade-level for this reason. It was hypothesized that students in the lower grade-levels (i.e., seventh through ninth) were likely to improve more than students in the upper grade-levels (i.e., tenth through twelfth) in their study and academic performance. If treatment procedures are to have any positive effects, the instructions for their use must be followed. It may be that the failure of college students to follow the study methods suggested in study-improvement manuals (e.g., Mahoe, 1970; Robinson, 1961; Watson & Tharp, 1973) is attributable in part to their educational level. That is, younger students may be less cynical and jaded than older students, and accordingly more likely to follow treatment instructions. T-test comparison of improved and unimproved students on the dimension of grade-level, however, did not support the hypothesis in question.

It was hypothesized also that students with superior past
academic performances, as reflected by cumulative G.P.A., are generally more successful in study-improvement attempts than students with inferior academic records. It may be that better students already possess some of the requisite skills for improving their study and academic performance; poorer students frequently lack both the scholastic skills and the academic motivation for successful study-improvement. The experimental findings of past investigations have indicated that remedial academic programs are usually least effective in reaching and maintaining the participation of the poor, "unmotivated" student (Beneke & Harris, 1972; Oakland, 1969; Robinson, 1961; Smith & Winterbottom, 1970; Spielberger & Weitz, 1964). A comparison by t-test of improved and unimproved students on pretreatment measures of G.P.A. showed no support for the above assumption.

Grades

Differential Effects of Treatment

The findings indicate that participation, as defined by expression of interest and enrollment in the study-improvement program, resulted in significantly greater academic performance, as measured by grades than no such participation (i.e., neither expression of interest nor enrollment in the program). In addition, the results show that an active form of treatment--regardless as to whether it was specific or nonspecific--produced reliably greater improvement in grade-point average than the no-treatment interested condition. Both no-treatment control groups, comprised respectively of those students
interested and those uninterested in participating in the study-improvement program, evidenced no change in grades throughout the duration of the program. Moreover, these no-treatment control conditions did not differ reliably from each other in grade-point average during the same period. Thus it appears that the motivation to improve academic performance, as reflected in an expression of interest in participating in the study-improvement program, is itself insufficient in bringing about any significant academic improvement.

It is important to note that no reliable differences in grades were found between self-monitoring alone and all the active treatment conditions combined. It therefore appears that, where improvement in grades is concerned, the addition of stimulus-control and self-contracting procedures to self-monitoring makes no significant contribution to the effectiveness of treatment over and beyond the use of self-monitoring alone.

Furthermore, the effects on G.P.A. of specific treatment comprised of various manual and group combinations of stimulus control and self-contracting were not reliably different from the effects of nonspecific placebo. Thus, while placebo treatment was significantly more effective than specific treatment in promoting study gains, these treatments did not differ in terms of producing grade improvements.

In addition, the G.P.A. data indicate that a combination of stimulus control and self-contracting was not any more effective than stimulus control in bringing about improvement in grades. This finding supports the results found in connection with the use of studying as a criterion measure.
Finally, there were no differential effects in grade point associated with self-administered treatment versus self- plus group-administered treatment, in line with the data on study rate. That is, the addition of group meetings to the use of self-instructional manuals did not make a contribution to academic improvement over and beyond that of self-treatment alone.

**Correlation between Studying and Grades**

The modest overall correlation of .11 found between daily average study time and quarterly grade-point average for Ss participating in the study-improvement program indicates that there may be little relationship between increased studying and improved grades. These results are buttressed by the supplementary finding that students who significantly increased their studying across treatment periods showed no difference in posttreatment grades as compared with students who did not display significant study increments. Indeed, t-tests between these two groups of improved and unimproved students on several measures of G.P.A. showed no reliable differences in grades obtained.

Thus the effect of the study-improvement program in increasing the amount of studying by participants is tempered by the failure to find corresponding improvements in grades in coursework. The failures of increases in the frequency of studying behavior to translate into increases in coursework G.P.A. represents a major finding of the study. Much more apparently is required to produce reliable improvements in course grades than intervention aimed at increasing study rates.
Other studies have found only moderate correlations between study rate and subsequent test performance. For example, Wiggins, Pope, and Bushell (1968) reported a correlation of 0.51 between studying and academic performance. Similarly, Bristol and Sloane (1974) obtained correlations of 0.45 and 0.41 between study time and test score for the self-monitoring and contingency-contracting groups, respectively. However, in the absence of data on the relationship between the course content assigned for study and test measures, or the specific study skills employed during studying, it is difficult to assess the significance of these correlational values.

The study-improvement program placed primary emphasis on improving the quantity, rather than the quality, of studying. Training of students in methods of behavioral self-control was aimed at providing students with the means for studying more with less effort. In line with this goal, students self-monitored their study time, arranged their immediate environment to facilitate studying, and implemented contingency contracts for shaping study behavior to higher levels of frequency. The focus throughout all of these efforts at study improvement was on increasing the amount of studying in which the student engaged.

The preponderance of student-participants in the study-improvement program indicated their desire to increase the amount of time spent studying. For these students, the initiation of study behavior was exceedingly difficult, as was the maintenance of studying once started. That is, they experienced great difficulty in sitting down to begin studying, as well as in continuing their studying for any
length of time. Such students found studying painful; they did not study enough and they knew it.

A number of participants in the study-improvement program, however, indicated that they did not wish to increase the time they spent studying; to the contrary, they desired to reduce their studying time. In effect, these students expressed the aim of studying quantitatively less but qualitatively more effectively and efficiently. For such students, the goal of increased studying is especially inappropriate. Any future study-improvement attempts at targeting higher rates of studying would do well to eliminate such students from enrolling in the program.

One of the major implications of the results is that the focus on increasing the studying of program participants may be completely inappropriate. Even for academically superior students such as those at Iolani with few deficits in verbal and quantitative skills, it appears that targeting increased studying misses the mark. It is apparently not enough to teach such students the means with which to enhance their amount of study time, at least if improved academic performance as measured by grades in coursework is the goal.

**Interpretation of Supplementary Findings**

**Changes on Paper-and-Pencil Instruments**

The results based on analysis of variance on supplementary variables show that the various treatments included in the study-improvement program did not produce much in the way of differential
treatment effects on self-report measures. Two-way (treatment x trial) analysis of variance on each of the four measures of self-report revealed no effects of any kind on the Internal-External Locus of Control, main trial effects on the study attitude scale of the Survey of Study Habits and Attitudes, main trial effects on both scales of the Semantic Differential, and treatment x trial interaction effects on the Test Anxiety Scale. The significant overall $F$ ratio obtained on the TAS appears to be attributable to artifact, in that the most divergent treatment mean happened to have an inordinately small cell $n$. The significant main effects on trial observed on two of the four dependent variables are not particularly noteworthy, since they seem to indicate only that there were significant overall changes between pretest and posttest, collapsing across experimental conditions. It appears that as a result of participation in the study-improvement program, Ss as a whole tended to self-report that changes occurred on the criterion measures in question irrespective of treatment received. In short, the various experimental conditions contained in the study-improvement program gave rise to no particularly meaningful effects on any of the criterion measures of self-report.

**Self-Evaluation of Treatment by Subjects**

On the whole, participants receiving treatment in the study-improvement program reported that they regarded the treatment program as relevant and helpful. In response to two pertinent items on the posttreatment questionnaire, Ss indicated that (a) they had found "some" of the material included in the study manual relevant to their needs.
as students, and (b) they had benefited personally quite "a lot" from participation in the program. There were no significant differences in these responses among treatment conditions, indicating that Ss evaluated the program similarly irrespective of the particular treatment which they received.

Sources of Experimental Bias

Loss of Subjects

Due to the relatively large proportion (27.9%) of dropouts from the study-improvement program, it is critically important to examine the implication of these losses in Ss. The initial random assignment of Ss to experimental conditions ensured that any differences among treatment groups at the onset of the experiment could be attributed to chance sources of variation. Here the issue of concern is not the loss of Ss per se, but the question as to whether or not subject loss has resulted in the destruction of randomness. For if the loss of Ss is inextricably related to the phenomenon under investigation, it is possible that randomness is lost and the initial equivalence among treatment conditions destroyed. As a result, a systematic bias may be introduced in the differences among treatment means which cannot be disentangled from the treatment effects.

There is reason to believe that the loss of Ss through dropout in the present experiment may be associated in some way with the phenomenon under study. Each of the experimental treatments required a considerable amount of work from Ss, and it is reasonable to assume
that at least some Ss dropped out due to the demands associated with treatment. Of course to the extent that treatment actually may have been responsible for subject loss, with the "less motivated" Ss quitting and the "more motivated" Ss surviving, the resultant dropouts could lead to an obvious confounding of subject differences and treatment conditions, since the more demanding treatments would contain a greater proportion of motivated students than the less trying treatments.

While it is possible that the loss of Ss was related to the experimental conditions in general, however, there is evidence that such loss was independent of particular treatment groups. The rate of dropout was approximately the same from all treatments, as indicated by a \( \chi^2 \) analysis of dropout frequencies which showed no significant differences in attrition among any of the treatment groups. Further support of this conclusion is provided by a test of the equality of two proportions between the group (self-contracting group) with the lowest proportion of dropouts (i.e., 33.3%) and the group (self-monitoring) with the highest dropout rate (i.e., 53.3%). This test showed that the differences between the highest and lowest rates of dropout were not reliable. Therefore, although the number of Ss lost was substantial, there is no evidence to indicate that this loss resulted in a bias among treatment groups.

**Reliability of Data**

A possible source of bias in the experiment stems from its failure to employ adequate procedures for the assessment of the reliability of the self-recorded data. The establishment of data
reliability represents a fundamental prerequisite for the validity of the study, particularly in the present investigation which relied on the use of Ss' self-reports on study behavior as a major dependent measure. Although independent observations by an external observer were employed as a check on the reliability of Ss' self-recording of study time, the representativeness of these independent observational data is questionable inasmuch as they were collected in a single study setting, the school library. In addition, due to the fact that the external observations of studying were based on a sample of only one-third of the students engaged in self-recording, the representativeness of the reliability check is called into further question. These limitations in the reliability-check procedures not only serve to restrict the representativeness of the independent observational data on study time, they also serve to point up the possibility of biases in the self-recorded data on study rate.

Another methodological shortcoming pertaining to the procedures for establishing the reliability of the self-recorded study data is the failure to report separate reliability coefficients (a) for each of the treatment conditions and (b) for each of the intervention periods. In the former case, calculation of reliability was hindered by unbalanced numbers of independent observations for Ss in the different treatment conditions, resulting in some conditions having more representative amounts of observational trials than others. In the latter case, assessment of reliability was mitigated by logistical considerations which prevented the earlier collection of observational study data by an external observer. For this reason, all independent
observations of Ss' study time were conducted during a part of only one phase--Week 3 of intervention II--of the study-improvement program. These methodological limitations in the assessment of the reliability of self-recording across treatment conditions and time periods hamper the determination of possible biases in the data.

Nevertheless, based on the available, though marred, data on the reliability of self-recording, there is some evidence that participants in the study-improvement program reliably self-recorded their study times throughout the duration of the experiment. An independent check by an external observer of the reliability of Ss' self-recorded study data produced an overall coefficient of agreement of 81.4%. Inasmuch as these externally-monitored observations were conducted on the studying behavior of a sample of one-third of the self-recording students in a single setting, the reliability coefficient obtained is regarded as partially representative of the population of all self-recording Ss in the study.

Additional support for the reliability of the self-recorded data on study time comes from the analysis of Ss' responses to pertinent questions on the posttreatment questionnaire. According to these self-reports, (a) Ss most of the time recorded accurately and continuously all their study times in their diary, (b) Ss seldom forgot to record any of their study times in their diary, and (c) Ss hardly ever recorded in their diary any study times in which they did not actually engage in studying.

Furthermore, analyses of variance showed no significant differences across treatment conditions in the degree of self-reported
reliability with which Ss self-recorded their study times. However, the self-contracting group and placebo group Ss reported that they were reliably less forgetful in the self-recording of their study times than the stimulus-control manual Ss. In general, according to analyses based on Ss' self-reports of their own reliability in data collection, it does not appear that those experimental conditions which reported substantially increased study rates across treatment periods were any more reliable in their self-recordings of study times than those treatment conditions which evidenced small or no increments in reported study output. Thus the superior study performances of some of the experimental conditions cannot be attributed generally to bias arising from more reliable and consistent self-recording of study times by Ss in these treatment groups.

Reliability of Operations

The reliability of operations, in terms of the degree and consistency with which Ss actually used the treatment procedures, was not adequately established in the present investigation. The only measure obtained on the reliability of operations was the posttreatment questionnaire, which simply asked Ss to rate their degree of follow-through in implementing the suggested treatment procedures. Such reliance on Ss' self-reports provided only partial and indirect verification that the treatment techniques in fact were applied by Ss. In the absence of more direct and complete assessment of the reliability of operations, it is difficult to ascertain whether Ss actually used the study-improvement methods suggested.
The problem of treatment reliability is an especially salient one in the current study, in which the principal treatment operations consisted of the implementation of self-control procedures. The specific self-control techniques included in the treatment program required the intermediate implementation step of completing checklists and worksheets detailing the plan-of-action. These beginning steps at implementation of treatment included (a) drawing up a study schedule, which verified Ss' attempt to use stimulus-control procedures with respect to time and place of studying; (b) setting up criterion shaping steps, which evidenced Ss' performance of the behaviors involved in self-applying shaping and rule-setting procedures; and (c) drawing up a contingency contract, which demonstrated Ss' effort in implementing self-reinforcement contingencies on studying. Since these checklists and worksheets were completed on a week-to-week basis, they served as data on the implementation of the independent (i.e., treatment) variables. Unfortunately, Ss generally were remiss in turning in these checklists and worksheets. Otherwise, more direct assessment of the reliability of treatment operations could have been obtained by inspection of these data in relation to Ss records of study time, as a way of corroborating the implementation of such treatment procedures as: (a) the self-application of stimulus control in regard to specified times of studying; (b) the self-administration of shaping procedures showing that the amount of studying increased progressively in line with criterion steps of the shaping plan; and (c) the self-imposition of rule-setting in relation to specified times and amounts of studying for particular courses.
Nevertheless, all of these reliability-check procedures are indirect at best; they still do not demonstrate the actual self-implementation of the treatment procedures. In actuality, they document the presumed effect of the self-regulatory operations. What is further required are reliable behavioral observations by independent observers, for example, of Ss actually rewarding themselves on contingency for engaging in studying. In the absence of such data, some reliance must be placed on partial and indirect confirmations of the implementation of self-control procedures, such as those described above. These partial and indirect sources of data provide useful, albeit inadequate, information on the degree and consistency with which Ss carried out the specified operations. Unfortunately, the use of inadequate procedures for assessing treatment reliability prevents the ruling out of the possibility of biases in the implementation of treatment operations across experimental conditions.

In the absence of data derived from more direct means of ascertaining the reliability of operations, Ss' self-reports of treatment implementation afford some illuminating data. The extent to which student-participants followed-through in the application of treatment procedures was assessed partially through the posttreatment self-reports of those Ss who received any form of intervention for study improvement. These students reported their degree of follow-through in four major classes of treatment behaviors. The results indicated that (a) Ss engaged in accurate and continuous self-recording most of the time, (b) Ss read the units of the study manual almost always, (c) Ss applied the suggested study methods most times, and
(d) Ss continued to apply the suggested study methods some of the time. An analysis of variance showed that there were no significant differences among treatment conditions in any of these categories of follow-through behaviors. Therefore, it appears that the differential outcomes associated with the various experimental conditions are not the function of the operation of bias stemming from differences in the extent to which Ss followed-through in the implementation of their respective treatment programs.

Contamination of Treatment Conditions

There appears to have been little bias resulting from contamination across experimental conditions within the program, on the basis of Ss' self-reports on the posttreatment questionnaire. Participants reported generally that they "never" read any of the study-improvement manuals which were given to other classmates in the program; Ss also reported that they "seldom" discussed any of the study-improvement techniques contained in their respective manuals with their classmates participating in the program. Additionally, there were no differences among experimental conditions in the extent to which Ss shared their study manuals or talked about study methods, according to analyses of variance of Ss' self-reports. E's explicit request to Ss at the start of the study to refrain from sharing study-improvement manuals and methods with one another until the conclusion of the program was followed apparently by Ss. As a consequence, there seems to have been minimal contribution of experimental bias due to contamination of treatment conditions.
Experimenter Bias and Therapist Specificity

A major potential source of bias in the present study is its use of a single E, who was the principal investigator himself, as the group leader in all counseling groups. The use of one E for all treatment groups raises the specter of possible experimenter bias, since E was knowledgeable as to the experimental hypotheses under investigation. Furthermore, the failure to employ multiple therapists or to cross treatments and therapists factorially may result in the inappropriate attribution of therapeutic benefits to the experimental treatment under investigation. It is important that the experimental design of the study provides controls for such "therapist specificity."

This problem is an especially salient one in the current experiment inasmuch as E, as an advanced graduate student in clinical psychology with more than a full year of internship experience, was a relatively well-trained clinician.

Generality of Results

Another important source of bias in the investigation is its special subject population and correspondingly restricted generality of results. Several considerations suggest that Ss in the present study were not representative of the total intermediate and high school population of students.

First, the location of the study—an all-male, college-preparatory school—is in itself a relatively unrepresentative educational setting in regard to its student population. Iolani School is in some ways a rather exclusive academic environment in that its
admissions and tuition structure generally favors academically superior students from middle-class backgrounds. Thus, the relatively high academic calibre of the student population serving as Ss in the study represents a major limitation in the generality of the reported results.

Second, the Ss of the investigation represent a rather special sample of students even with respect to the population of Iolani students. Whereas almost 30 percent of the entire student body of the Upper School expressed an initial interest in the study-improvement program, 42 percent of these interested students self-selected themselves to the extent of signing the commitment contract and enrolling in the program. Thus, it is evident that the approximately 15 percent of Iolani students who actually participated in the study represented a fairly select sample in terms of interest and motivation. The use of such highly motivated student-volunteers restricts to a certain degree the generality of the study's findings.

A related problem in the generality of the findings of the present study is that of subject attrition. Inasmuch as approximately 28 percent of the student-participants dropped out of the study-improvement program prior to its termination, those completing the program constituted a student population that may be characterized as sufficiently motivated to translate their desire to improve into action. Accordingly, the data obtained in the study are based largely on Ss who were motivated not only to enter the study-improvement program, but also to follow-through in their involvement in it as well.
CHAPTER X

IMPLICATIONS AND CONCLUSIONS

This concluding chapter reviews the major problems encountered in the present approach to the self-improvement of studying, particularly in relation to the use of study time as a criterion measure and the rate of dropouts from the program. Included are suggestions for procedural improvements for handling these problems. Some of the important implications of the study are elaborated in connection with the effects of placebo and social influence. In addition, practical and theoretical considerations in regard to the present model of study self-improvement are discussed. Finally, some conclusions of the study are drawn.

Major Problems in the Present Approach

Problems of Study Rate as a Measure

Study rate was selected as a principal dependent variable of the investigation because it constitutes the most direct measure of the treatment effects of the independent variables. That is, the therapeutic effects of the behavioral self-control procedures acted most directly on amount of time spent studying. Nevertheless, there were some major problems associated with the use of daily study rate as a criterion measure, in regard to its variability and its relationship with grades.

Variability in Daily Study Rate

As a dependent variable, daily study time constitutes a
troublesome measure in that there is a large amount of variation associated with its use. The typical student exhibits enormous variability in the amount of studying in which he engages on a daily basis. Moreover, students vary greatly from one another in the frequency with which they emit studying behavior. As a result, the use of study frequency as a criterion measure gives rise to substantial variance inherent in the nature of the behavior. This variability may assume the form of both within-subject and between-subject variance.

The variability associated with the use of study rate as a dependent variable, if left uncontrolled, contributes to experimental error and obscures the effects of the independent variable. For this reason, it is necessary that either experimental or statistical control is exercised over sources of extreme variation arising from inordinately large within-subject and between-subject differences.

In the present experiment, the extraneous variation associated with employing study rate as a criterion measure produced error variance which tended to obscure the effects of treatment. While the analysis of covariance removed a portion of this variance, the use of such statistical control was only partially effective in controlling for this source of extraneous variation. Alternatively, pretreatment equivalence between experimental conditions on this factor may have been assured more appropriately through the use of experimental control, such as a randomized block design in which Ss are assigned randomly to treatments in homogeneous blocks.
Relationship between Study and Grades

Another problem associated with the use of studying as a dependent variable in the present experiment is its apparent lack of relationship with grades in coursework. The failure of improvements in study rate to translate into corresponding improvements in grade point suggests the inappropriateness of employing changes in amount of study time as a criterion variable.

Thus the commonly-held assumption that improvement in grades is a function of increased studying is called into serious question, at least for students such as those in the present investigation, who tended to be bright and motivated. "Study more in order to obtain better grades" may not be the appropriate battle cry for such students. It may be that more frequent studying is a necessary, though insufficient, condition to improve academic performance, at least as measured by grades. More likely, it is necessary for students to enhance the quality, if not the quantity, of their studying as a means of attaining improvements in grades.

The critical research question, then, relates to the kind of studying behaviors in which program-participants engaged when they increased their studying. Was it simply quantitatively more of the same kind of studying or was it qualitatively different kind of studying as well? Unfortunately, the research design and methodology of the present experiment provided insufficient data bearing on this issue.

The investigation also was hampered in that changes in the amount of studying by student-participants represented the only direct
performance measure of study behavior. What is needed are additional behavioral measures which tap not only the quantity, but also the quality of studying as well. As it is, the investigation relied on the use of a paper-and-pencil instrument, the Survey of Study Habits and Attitudes, as a criterion measure of self-reported changes in study pattern as a result of participation in the program. Such self-report measures are useful, though inadequate, as a means of determining sensitively and nonreactively changes in study habits and methods.

The Problem of Dropouts: Some Countermeasures

One of the most salient findings of the study is the relatively large dropout rate of the present approach to the self-improvement of studying. It thus appears that one of the major problems in the development of self-control behaviors for study-improvement is the high rate of attrition for individuals during training. The experimental data on program attrition underscore the importance of developing ways of ensuring the continued involvement of students in study-improvement efforts.

The immediate focus of intervention might be centered more appropriately on the elicitation and maintenance of the requisite behaviors for participation in the study-improvement program, rather than on the improvement of study and academic behavior per se. The performance of the former behaviors of program participation may be regarded as prerequisites to the development of the latter behaviors of study improvement. For no matter how sound methods for study improvement may be, they are effective only to the extent that they
actually are used. For this reason, it is essential that study-improvement efforts direct more attention at encouraging students to actually apply the suggested study techniques.

Accordingly, the initial target of intervention efforts might focus specifically on the "program-participation" behaviors of doing the work of the study-improvement program, as a direct means of improving studying itself. The work required for the self-improvement of studying may include such specific behaviors as (a) self-monitoring of study time, (b) self-application of stimulus-control methods to studying, and (c) self-implementation of contingency-contracting procedures for study. These self-controlling behaviors constitute the means for study improvement, and as such represent critically important requirements of the program. The actual fulfillment of these program requirements by participants should be ensured; to the extent that this is done, the likelihood of subsequent improvement in study and academic performance is enhanced.

In short, the success or failure of attempts at study self-improvement may well depend on the success of the program in getting student-participants to actually apply the study-improvement methods suggested. A number of strategies may be employed for increasing the probability that program participants follow-through in their application of self-control techniques.

First, it is important that the rationale for the use of all suggested methods of study improvement is presented fully to students. Since the application of self-control procedures generally requires considerable effort, it helps if students are made fully aware of the
justification for their use. Otherwise, lacking an adequate understanding of the reasons for employing certain procedures in certain situations, students are likely to regard the use of such techniques as more trouble than is worth the effort.

Second, it is essential that the behaviors involved in implementing the suggested study-improvement methods are specified precisely. The particular behaviors required for improving study and academic performance should be delineated in explicit terms. Thus each of the sub-behaviors involved in self-monitoring, self-directed stimulus control, and contingency self-management should be spelled out. For example, in order to facilitate the self-application of contingency-contracting procedures, the requisite behaviors involved must be specified, including (a) setting criterion behavior subgoals as shaping steps, (b) selecting appropriate reinforcers, (c) drawing up a self-contract, and (d) dispensing reinforcement contingent upon performance of the criterion behavior.

Third, the behaviors of doing the work of the self-improvement of studying program themselves may be targeted expressly for intervention. Relevant antecedent and consequent events may be arranged by the student such that the required behaviors of the study-improvement program are facilitated. In particular, the student may structure his study environment in such a way that, before anything else, the behaviors of program participation are initiated and maintained. For example, environmental cues may be arranged to prompt the initiation of self-monitoring, self-monitoring itself may serve as a discriminative stimulus for maintenance of stimulus-control procedures, and self-
contracting methods in turn may be used to support attempts to engage in such self-improvement techniques as self-monitoring and stimulus control.

Marston and Feldman (1972) have suggested that the success of self-control programs is a function of two variables: (a) the strength of the commitment act in which the individual makes a personal commitment to change his behavior, and (b) the effectiveness of the particular self-control procedures which are employed by the individual in modifying his own behavior. Accordingly, programs for the self-improvement of studying should attempt to influence both of these variables—(a) by increasing students' awareness of their reasons for changing their study behavior, and (b) by instructing students in effective self-control methods for facilitating such changes.

Self-regulatory strategies capitalize on the fact that the individual himself may be the best potential observer and modifier of his own behavior. However, this promising position is worthless if attempts at behavioral self-regulation are not maintained. The maintenance of the controlling response has been termed the "contract problem" since it involves an obligation or commitment to change (cf. Marston & Feldman, 1972). Certainly, the contract problem is one of the most challenging aspects of the self-control enterprise (Mahoney, 1970, 1972).

Taking a clinical perspective, Franks and Wilson (1973) have stressed that no matter how straightforward and technically sound are "how-to-do-it" manuals for enhancing self-control for the nonprofessional (e.g., Watson & Tharp, 1972), active and skilled therapeutic supervision
is usually necessary for the effective implementation of self-regulation. The crucial point underscored by these investigators is that the therapist-client relationship frequently plays a decisive role in the facilitation of therapeutic behavior change. Specifically, the therapist and client enter into a contract with one another in which they specify and commit themselves to certain mutually agreeable means and outcomes of the behavior change endeavor. In this context, it is not enough for the therapist to simply teach the client a set of techniques for changing behavior. Whether the client actually will make use of such training is the primary issue and will depend on the same variables that influence all interpersonal negotiations (Kanfer & Karoly, 1972). In other words, it is often insufficient to train the client in self-control procedures without first establishing a contract to ensure that these techniques for facilitating behavior change in fact are applied and maintained.

In Kanfer and Karoly's (1972) behavioral analysis of self-regulation, the contract issue represents a central component in the self-control process. In their theoretical model of self-regulation, the contract occupies a special position in which it is recognized as an essential means for expediting behavior change through self-control. Contract-making involves the verbalization of intention statements, performance promises, or commitments. Such intention statements and promises may be viewed as verbal operants. The pitfalls associated with attempts to infer intentions from actions are widely known. Nevertheless, it is important to recognize the discriminative and reinforcement nexus within which overt and covert statements of intention
occur. The intention statement may well constitute one of the most critical components of the self-regulatory process.

The critical research issues are under what conditions are contract or intention statements likely to be made, and perhaps more importantly, under what conditions are intention statements likely to lead to behavioral action consisting of the matching of behavior to stated intentions? Of particular significance are the conditions providing the all-important link between verbal operants of the contract-making class and behavioral execution—-that is, the factors that facilitate the matching of actions to words. In this connection, it is important to refrain from reinforcing performance promises that are not fulfilled, lest "empty" verbalizations are rewarded in lieu of legitimate efforts at self-control.

It appears that an essential step in any self-control program using contingency contracting in particular is ensuring that the individual complies and follows-through with the terms (i.e., rules) of the self-contract, particularly with respect to dispensing the self-reward when earned and withholding it when not earned. Such compliance in the administration of contingent self-rewards may be brought about and strengthened through a host of methods, including modeling, differential reinforcement, and punishment for rule violation. As an additional means, Watson and Tharp (1972) instructed individuals to employ a shaping process to insure resistance to noncontingent self-rewarding. They emphasized that if the self-modifier finds himself "cheating," he probably is requiring more of himself than he is currently capable of doing, and therefore should
reset his subgoals (i.e., shaping steps) at a lower level. Then, through a process of gradual shaping he may work his way up to increasingly difficult behavioral performances.

In addition, the use of the student's natural relationships can serve as a valuable adjunct in fostering and maintaining desired study habits. Since the student's social nexus constitutes an integral part of his daily world, it follows that adaptive study behaviors can be facilitated by relying upon significant others (e.g., parents, teachers, siblings, or friends) in his natural environment as change agents (Tharp & Wetzel, 1969). Since people to a large extent control other people's reinforcers, there is much to be gained from enlisting the involvement of natural mediators in prompting and rewarding the student's study and academic performance. Clearly, by ensuring the cooperation of significant others, effective self-control behaviors learned as part of the study-improvement program can be extended more reliably to present and future study situations.

In this regard, it may be advisable for the student to take active steps in soliciting the involvement of significant others in his immediate environment. For example, as part of his attempts at study self-improvement, the student may post in a public place a graph depicting his weekly progress in study or academic performance. By doing so, he increases the likelihood that other people will notice his progress and praise him for it. Another strategy for enhancing the chances that study improvement results in reinforcement is for the student to explicitly arrange for natural mediators to reward him for progress by providing him with social approval and attention, or by
granting him access to material or activity rewards under their control.

A major limitation in the present approach to the self-improvement of studying is one inherent in and common to virtually all educational and therapeutic endeavors: participants in the program must want to change. The study self-improvement program described herein is extremely goal-oriented and task-oriented. Considerable energy expenditure on the part of the student-participant is required to engage in the numerous behavioral tasks. The individual student continually is assessing the effort required in making a response against the rewards available to him for doing so. In short, no matter what rewards the student—along with significant others—is able to bring to bear, the individual himself at the least must want to change enough to do the work of the self-improvement program (Watson & Tharp, 1972). Nevertheless, as outlined in the present endeavor, there is much that the individual student can do in arousing and sustaining his own motivation throughout the self-improvement effort.

Implications of the Results

Effects of Placebo

The potency of the treatment effects of attention-placebo merits extended discussion. Dynamic-willpower treatment consists of the following steps leading to the self-improvement of studying: (a) an appeal to exercise willpower; (b) self-monitoring of studying; (c) studying in multiple settings and at different times (i.e., a kind of reverse stimulus control for broadening the domain for the application
of willpower); (d) setting ambitious goals and relying on willpower to achieve them all at once (i.e., a reverse counterpart of shaping); (e) engaging spontaneously in unplanned studying (i.e., avoiding setting rules for studying so as to increase the opportunity to practice willpower on a completely spontaneous basis); and (f) associating studying with pleasant things on a "first engage in the rewarding activity, then study" basis (i.e., a form of noncontingent self-reinforcement).

Such a treatment approach for developing dynamic willpower is analogous in content and structure to the behavioral self-control program. While the procedures included in the internal-willpower approach are deviations of major principles of learning theory, they nevertheless fit together well within the rationale afforded by the willpower framework. Accordingly, there appears to be considerable face-validity in the treatment procedures comprising the internal-willpower approach; this condition therefore constitutes an extremely plausible and appropriate attention-placebo condition for controlling the nonspecific effects of treatment, such as attention, placebo, and demand characteristics.

As it turned out, there is evidence that the attention-placebo condition was extremely well-accepted by program participants assigned to it. Ss responded favorably to its exhortation elements and to its explicit rationale, both of which were integrated persuasively within the framework of internal willpower. Ss also responded positively to this treatment condition in terms of their significant gains evidenced in study rate, though not in corresponding grade point. Moreover, the
superiority of placebo treatment over a combination of behavioral treatments in enhancing studying output raises a number of questions. It is possible that the demonstrated efficacy of attention-placebo treatment may be attributable in part or in whole to four considerations, each of which is discussed in turn.

First, it is possible that the gains in study rate of Ss undergoing placebo treatment reflects self-reported rather than actual behavior change. That is, in response to exhortation for increased studying, Ss simply may have reported that they studied more when in fact they did not. There are data from two sources that suggest that members of the placebo group did not fudge their self-reports of study time. The overall degree of agreement between self-reported and externally-observed study times reflects the reliability of the self- recorded data; also the self-reports of Ss in response to the post- treatment questionnaire seem to mitigate against the possibility that placebo Ss self-monitored their studying any less reliably than other program participants.

Second, the possibility exists that the nature of the attention- placebo treatment gave rise to greater expectancy and demand characteristics than those present in the other treatment conditions. While placebo treatment is designed as a control for the influence of expectancy and demand characteristics operating in the experiment, it may be that the action of nonspecific factors was more salient in the placebo group than in the other groups, due to the former's more explicit and pronounced emphasis on studying more. That is, inherent in the act of exhorting students to assume greater willpower over their studying
behavior was the expressed demand for increased study performance.

Third, there is a possibility that some of the observed effects of attention-placebo treatment may be attributed to the action of reinforcement. Inasmuch as the placebo condition assumed the form of group treatment, it is probable that members in this condition, as individuals or as a group, rewarded one another for showing study and academic improvement. Furthermore, since placebo Ss were encouraged to set ambitious study goals and achieve them immediately, it may be that large, initial increments in studying rate were prompted for and, when they occurred, were reinforced explicitly by other group members and perhaps implicitly by E. Such reinforcement operations inherent in the nature of the placebo group treatment may have given rise to an early, increasingly escalating cycle of improved study performance.

Fourth, the possibility exists that the effects of placebo treatment may be a function of the operation of social influence. It is possible that the application of what may be conceptualized as social-influence techniques is responsible in large part for the observed effects. An integral aspect of the dynamic-willpower approach to study improvement was its exhortation of students to seize ultimate control of their lives, summon untapped internal reservoirs of willpower, engage in positive thinking, and so forth. Such "you can do it if you put your mind to it" rhetoric was designed to arouse the student's enthusiasm and obtain his personal commitment for constructive behavior change. Such attempts at social influence and persuasion may have exerted a powerful effect in altering the behaviors of these intermediate and high school students. Moreover, the modeling effects of E as an
authoritative and relevant model (i.e., study-improvement expert and "successful" alumnus of the school) may have enhanced the credibility and pertinence of his study-improvement suggestions.

Effects of Social Influence

The overall results of the study point up the possibility that the active therapeutic ingredients accountable for the observed treatment effects may encompass treatment variables that go beyond those constituting the major focus of the present investigation, which examined the differential effects of such behavioral intervention procedures as self-monitoring, stimulus control, and contingency contracting. The failure of these independent variables combined to produce study improvement which exceeds that associated with attention-placebo raises the specter that outcomes usually attributed to the efficacy of these behavioral techniques may simply reflect in part the operation of placebo factors such as attention, expectancy, and demand characteristics.

In addition to suggesting the operation of nonspecific therapeutic variables in the use of behavioral self-control methods, the findings of the investigation point up the possible influence of other active therapeutic factors present in the overall treatment package. The presence of these previously unspecified treatment variables may have accounted for an undetermined part of the observed outcome; their influence seemed to have been especially manifest in the treatment effects associated with attention-placebo. The combined
effects of some of these unspecified therapeutic factors may be subsumed under the rubric of social-influence variables. The results of the study-improvement program, particularly in regard to the efficacy of placebo in enhancing study rate, suggest the potency of social-influence procedures. The use of exhortation and persuasion methods, which were designed as an integral part of placebo treatment to elicit the student's enthusiasm and commitment for study and academic improvement, may have been partly responsible for bringing about gains in studying performance.

These results and speculations suggest the feasibility of developing an intervention approach to study improvement that includes a combination of social influence and behavior modification procedures, geared to the particular problems of the students comprising the target population. Such a treatment approach emphasizes the initial, behavioral assessment of each individual student's presenting difficulties, leading to a differential behavioral diagnosis. For instance, students entering the study-improvement program would be classed into such behavioral diagnostic categories as (a) inadequate study effort, (b) deficits in study skills, (c) study or test anxiety, and so forth. Treatments would be matched to students accordingly. That is, specific treatment procedures would be earmarked for specific problem behaviors, through the application of a variety of therapeutic techniques such as (a) social-influence techniques, (b) behavior modification procedures, (c) systematic desensitization, etc.

The application of social-influence techniques is called for specifically to elicit the student's personal commitment to study
improvement and to instigate his attempts at academic improvement. The use of behavioral self-control procedures is warranted especially in maintaining the student's continued efforts at study and academic improvement. Employed together, the combined use of both social-influence and behavioral self-control methods serves to initiate and sustain the critical behaviors involved in the self-improvement of studying.

**Practical and Theoretical Considerations**

The failure of students to follow-through in their study-improvement efforts can be related to a number of possible controlling variables extant in the natural environment of students. First, it is likely that many students have a learning history of attempting to improve their studying through a variety of means, and failing. Inasmuch as many of such attempts at study improvement involve the use of study methods on a trial-and-error basis, the chances of success are few and far between. As a result, the student is conditioned to extinguish his efforts at study improvement soon after it appears that a study method is not going to work. Such a past learning history of trial-and-error application of study techniques works against any current attempts at study improvement. For unless a study method works immediately and dramatically in improving the student's academic performance, it is likely to be dispensed along with the rest of the other techniques tried and discarded. Furthermore, while effective study methods may result in gradual and subtle gains in study and
academic performance, the likelihood that they will produce immediate and large increases in course grades is relatively slim.

Unfortunately, the social significance of grades dictates that students will continue to rely on grade changes in coursework as the sole criterion for judging the merit of a given study method. The exclusive reliance by students on course grade change as the only important index of study improvement is undue in that the variables controlling the grades that a student receives extend beyond the realm of the study techniques which he uses. For instance, grades in coursework also are affected by such academic-related behaviors as his participation in class discussion, his ability to read and write well, his skills in listening and note-taking, and his emotional reactions to examinations, to name a few. In addition, there is little question that course grades are influenced subtly and not so subtly by academically unrelated considerations, such as the teacher's expectations regarding the student's performance (e.g., labeling of students in terms of "good" and "poor" students), the relationship between teacher and student, the student's interest in the subject material, and the student's extent of involvement in extracurricular activities. Furthermore, the student's attitude toward learning and his motivation to perform well scholastically represent some of the other, more intangible factors affecting academic performance. In short, the study and academic performance of the student varies as a function of a wide range of controlling variables.

One particularly pertinent variable in this regard is the student's ability to make himself study when he needs to—that is, his
capacity to get himself to study when he wants to, or when he does not want to but has to. This ability of the individual to get himself to undertake tasks which are difficult, effortful, or otherwise unpleasant is highly adaptive, especially in educational endeavors.

Although such ability commonly is conceptualized as a fixed, personality characteristic in terms such as self-discipline, self-motivation, and willpower, an alternate conceptualization is to view these acts of self-control simply as behaviors, or more precisely, operant responses. This latter behavioral perspective of self-control implies that such self-control behaviors can be learned, in accordance with the same principles of learning governing other human behaviors. That is, self-control in behavioral terms is conceptualized simply as the individual's learned repertoire of skills for making himself do what he wants to do. The usefulness of this behavioral conception of self-control derives directly from the fact that the individual actually may be taught to exercise self-controlling behaviors.

Such a behavioral view of self-control has substantial implications for attempts to help students to improve their study and academic performance. One of the foremost implications of this conception of self-control, as applied to the educational setting, is that students may be taught to acquire a repertoire of skills in behavioral self-control as a means of improving their study and academic performance. That is, an alternative strategy of intervention in study improvement may consist of training students in acquiring greater self-control over their studying behavior. This treatment strategy is more pertinent when self-control is conceptualized as a learned skill rather than when it is viewed as a global personality trait that the person either has or
Teaching students the skills involved in acquiring behavioral self-control over their studying may represent a viable model of intervention for study and academic improvement. Specifically, this intervention model focuses on training the student in general strategies and specific procedures for obtaining increased self-control over study behavior. These methods of behavioral self-control are derived directly from empirically-based principles of learning theory and behavior change. The student is taught to self-apply these self-control techniques to his study and academic behavior. As a result of the self-implementation of these self-control procedures, the student learns to influence and manage his studying more effectively. In particular, he learns to use behavioral procedures for the self-management of his study behavior with respect to studying more frequently and more regularly.

One of the major advantages of the application of behavioral self-control strategies is that the student learns to put his study behavior under his own self-control, rather than under the external control of events outside of his influence. Generally, the study behavior of students is under the control of external determinants, such as the cajoling of parents, the threats of teachers, and the study practices of fellow students. Moreover, the frequency of studying usually varies as a function of the examination schedule, with studying escalating to peak levels just prior to exams and declining to minimal levels during the intervals between exams (Wiggins, Pope, & Bushell, 1968).
To the extent that the student has a learning history of studying under the influence of these external determinants, his study behavior is likely to occur only when he is pressured to study--due to the presence of external agents or the imminence of exams. Certainly, permitting study behavior to come under the external control of influences outside of the individual has a number of distinct disadvantages associated with it.

First, the presence of external agents to monitor the individual's studying cannot always be ensured; such is the case in the college environment where the student frequently is left completely on his own regarding when, what, and how much studying in which to engage. It is possible that students with a history of studying under the external influence of social agents, particularly throughout intermediate and high school, experience severe difficulties in getting themselves to study in the relatively free and unstructured environment of the college setting.

Second, whereas students are given frequent, often weekly, quizzes and tests in intermediate and high school, exams in college are administered typically only twice during the semester--at midterm and at the end of the term. Thus while sporadic, last-minute studying under the pressure of exams may serve the student well in high school, such study habits are likely to cause the student to fall short in his preparation for exams in college. Indeed, a study pattern in which studying peaks at exam time and drops during the intervening periods between exams may prove disastrous in preparing students adequately for exams in college. There is likely to be simply too much study
material to be covered in too short a time span for the student to pull it off.

Third, given the numerous distractions of college life, the student whose study behavior is under the external control of situational factors may find himself completely unable to get himself to engage in studying. His study behavior may have been too long under the situational control of events beyond his own influence for him to begin suddenly to exert self-control over his studying. Under these circumstances, the student may find himself hopelessly unable to study frequently enough, and as a result, totally at the mercy of the external stimuli affecting his studying.

In this context, it is clear that there are some major advantages in training students in the acquisition of self-control over their study-behavior. Students with a repertoire of behavioral self-control skills for managing their studying are not at the complete mercy of their immediate environment. Such students can resort to the self-application of methods of behavioral self-control for inducing themselves to study sufficiently in the absence of the external influence of social agents and frequent examinations, and in the presence of an unstructured environment replete with distractions to studying.

Accordingly, intermediate and high school students who receive training in behavioral self-control of studying in effect prepare themselves for studying under any presenting circumstances. These students possess the skills for creating and managing their own study environment, no matter how adverse or incompatible their external environment may be to studying. In particular, students equipped with
a repertoire of behavioral self-control skills in intermediate and high school would be expected to enjoy a major advantage in maintaining their study and academic performance in college. Such students are likely to be more adaptive and resourceful in meeting study and academic requirements, regardless of the limitations and restrictions of their educational environment.

Finally, an important advantage of an intervention model focusing on behavioral self-control is that there is an increased likelihood that the student will leave the study-improvement program with a strong personal belief in his ability to manage and modify his own behavior. The importance of having the individual learn that he has the ability as well as the responsibility of self-directing his own behavior cannot be overemphasized. The individual's reliance on his own repertoire of self-controlling behaviors frees him from being at the complete mercy of his immediate environment. As a result, the person who has developed behavioral self-control skills in his repertoire clearly has a wider range of existential choices and alternative behaviors open to him. In a real sense, free will comes easier for him.

Conclusions of the Study

In conclusion, the behavioral intervention model for the self-improvement of studying reported herein appears to have achieved some limited success with its target population. Students participating in the study-improvement program generally improved their study performance in terms of successfully increasing their rate of studying.
In terms of enhancing their academic performance as reflected by gains in coursework G.P.A., moreover, the overall treatment program evidenced some positive impact in this area.

The intervention model described herein for training students in behavioral self-control shows some promise as a feasible and economical treatment for academic underachievement. Some of the more effective procedures of this approach to study improvement—especially certain of its self-instructional and group-contact elements—may be used for helping large numbers of students easily and inexpensively, rather than relying on the limited time and manpower of counselors engaged in individual consultation. Although a presumed advantage of a self-regulatory approach to behavior change is its increased efficiency as compared with other treatments, the present investigation provides insufficient data with which to evaluate the relative cost-effectiveness of behavioral self-control methods of study improvement.

It is important to note, however, that those students most in need of remedial academic help are (a) less inclined to seek study improvement or counseling (Oakland, 1969; Smith & Winterbottom, 1970), and (b) less prone to develop adaptive study skills even when compelled to participate in study-improvement programs (Beneke & Harris, 1972; Robinson, 1961; Spielberger & Weitz, 1964). For these reasons, it is imperative that research attention is directed at the development of effective methods of behavioral intervention for enhancing participation in treatment by " unmotivated" students who most need help. It is possible that such students may be differentially responsive to a combined intervention approach emphasizing the selective application of such treatment techniques as social influence, behavior modification, and systematic desensitization.
A final research issue concerns the durability of behavioral changes produced by the self-improvement methods under investigation. A fundamental assumption and purported advantage of a behavioral self-control approach is that the probability of generalization (across time, settings, or behaviors) and maintenance of behavior is increased greatly (Bandura, 1969; Cautela, 1969; Thoresen & Mahoney, 1974). In particular, training students in the application of behavioral self-control presumably increases the probability that they will continue to self-direct their own behavior change long after termination of the study-improvement program. Whether program participants, however, actually follow-through in their use of such procedures as self-monitoring, stimulus control, and contingency contracting remains an empirical question. Therefore, it is necessary that a follow-up study is undertaken to assess the long-term effects of intervention in relation to the generalization of behavioral changes across time.

A related question demanding research attention is the generalization of self-control behavior across other behaviors and situations. That is, how is training in behavioral methods of self-control likely to affect the student in terms of not only his study and academic performance but also a lifetime of adjustment? After all, the ultimate goal of instructing the individual in behavioral self-control skills is to provide him with effective means of controlling his own behavior in diverse situations throughout his life.

Thus it is essential that future research includes both cost-effectiveness and follow-up analyses of treatment and outcome in order to evaluate empirically some of the major assumptions underlying the concept of behavioral self-control.
Dear Iolani Student:

Does studying sometimes get you down? Is studying a real drag for you at times, with the effort required enormous and the rewards small? Do you find that the amount of studying required by your courses is often more than your willpower can handle?

If you responded affirmatively to any of these questions, it may be that the "Self-Improvement of Studying" Program is just what you need. This do-it-yourself study program is specifically designed to improve your studying habits and enhance your academic (test) performance. The emphasis is on teaching you to apply to yourself study techniques that make studying much easier. Moreover, since better learning and higher grades are likely to result, studying may become a more rewarding endeavor for you as well. Indeed, the ultimate aim is to make studying a much more enjoyable experience than it presently is. That is, studying may become less of a hassle and, unbelievably, more of a joy in your life.

This Study Clinic is being conducted throughout the second quarter as a research project. It involves the use of a newly developed, self-instructional manual for teaching students how to apply self-control to their study life. While all the study methods included in the program have been shown to be effective, some of these methods are likely to be more effective than others. A major objective of the Clinic is to determine which study techniques are most helpful, and to use these research findings in improving the study manual for the benefit of future students.

If you are interested in participating in the Study Clinic, or wish to know more about it, please fill out the form below and place it in the box marked "Self-Improvement of Studying" located under the Library.

Mahalo,

Walt Fo
Department of Psychology
University of Hawaii

"Self-Improvement of Studying" Program
Expression of Interest

Dear Mr. Fo:

I am interested in learning more about the study program.

I am interested in participating in the study program.

(check one)

Student's Name ________________________
Grade-Level ________________________
APPENDIX B
HEADMASTER'S LETTER OF INVITATION

IOLANI SCHOOL
Honolulu, Hawaii 96814

October 31, 1974

Office of the Headmaster

Dear Iolani Student,

Walt Fo, an Iolani alumnus and a doctoral student in Clinical Psychology at the University of Hawaii, has asked to do his Ph.D. dissertation here at Iolani School. He has developed a self-instructional study program for helping students to improve their studying and academic performance. His study program is open to all Iolani students interested in improving their study habits or increasing their scores on exams.

It is likely that all Iolani students could benefit from a study program designed to equip them with helpful study skills and techniques. Certainly, effective study methods are an important asset in enabling students to do well academically both here at Iolani and in college. Therefore, I encourage you to look into what the study program has to offer.

Attached is a letter of invitation from Mr. Fo describing his "Self-Improvement of Studying" Program.

Sincerely,

David P. Coon
Headmaster
APPENDIX C
PROGRAM DESCRIPTION

"Self-Improvement of Studying" Program

Introduction to Participants

Program Objectives

The "Self-Improvement of Studying" Program is designed to improve your study skills and academic performance. The primary objective is to equip you with effective study habits and methods through the use of a self-instructional manual. This do-it-yourself study manual has been developed specifically for teaching you ways of acquiring greater self-control over your studying behavior. Through reading and following the manual, you can learn to make studying easier as well as more rewarding for yourself.

Research Objectives

Another major objective of the study program is its research focus. The present program is designed as a research project for evaluating various sections of the self-instructional manual to determine which self-improvement methods are the most effective. While all of the study techniques included in the manual have been shown to be helpful, some of the methods are likely to be more effective than others. Which study procedures are most effective can only be ascertained through systematic scientific comparisons such as the one currently being conducted. In this connection, it is important to note that the study methods which appear to have more face validity (that is, seem to be valid through common sense) than others may not necessarily be more effective; only through carefully designed scientific comparisons can the most powerful methods be identified.

For this reason, you will be given different portions of the study manual. You are to read and follow only the instructions of the study manual which you are given. By carefully applying the ideas and suggestions contained in the manual which you receive, you are likely to enhance markedly your academic performance and at the same time help to improve the effectiveness of the manual for the benefit of other (future) students. Therefore, I ask that you do not read the manuals of any of your classmates participating in the program, as doing so will destroy the scientific nature of the research study. It is also important that you do not discuss with one another the various study methods that you are using, since doing so will introduce error into the results of the study.
By following these instructions, you can help to make the present program a true research endeavor, as well as ensure the validity of the planned scientific comparisons. Moreover, by doing your part in this research effort, you will also be helping yourself and other students in the program. This is because the research findings of the study program will be shared with all of you. That is, at the conclusion of the program, you will be told which study procedures turned out to be the most effective so that you all can apply them to your study life. In short, everyone will benefit from doing his part.

Program Integrity

It is important that you understand the relationship of the self-instructional study program to Iolani School. The study program is being conducted as an independent research/service project by me, a doctoral student at the University of Hawaii. As such, the study program is administratively separate from Iolani School, which has allowed the program to be conducted and is interested in its overall results. It is possible that particularly effective aspects of the study program may later be incorporated into the educational and counseling services offered by the school.

What this means is that how successfully or unsuccessfully you are in using the study manual in improving your studying will have no bearing on your standing with the school administration. Thus the role of the school counselor, for example, is limited to helping to get the project off the ground. The counselor is primarily concerned with helping me to ensure that you, as program participants, follow through in your record-keeping, regardless of how much studying you are doing or how much success or failure you are experiencing with the study manual. Accordingly, no one in the administration or faculty at Iolani will be shown the study records and results of individual students at any time. While the Iolani School staff of course will be interested in the general outcome of the study program, none of the results in terms of the studying and academic performance of individual students will be made available to them.

Commitment Contract

If you would like to participate in the study program, I am requesting that you enter into a formal contract with me to undertake a personal commitment to participate fully in the program until its completion at the end of the current quarter. By signing the contract, you specifically agree to fulfill the following requirements of the study program: (a) to read carefully the study manual which you are given; (b) to follow systematically the instructions contained in the manual regarding the self-application of methods for improving your studying; (c) to keep an accurate and ongoing written record of your daily studying behavior, your self-application of suggested study
methods, and weekly quiz and exam scores; (d) to turn in these records once a week (every Monday); and (e) to complete a number of questionnaires and inventories at the beginning and ending of the program.

I ask that you sign this performance contract as a precondition to participation in the study. I also will put my signature to the contract, as will a classmate or parent who will serve as a witness for the two of us involved in the contract. One copy of the contract will be given to you, while a second copy will be retained by me.

Record-Keeping

You are requested to keep a continuous record of your studying behavior throughout the duration of the program. A daily study diary has been given to you for this purpose. You are to carry it with you wherever you might study throughout the day. When you do study, simply make an entry of the subject studied, the time you started studying, the time you stopped studying, and the number of minutes you studied. In this way, you are to record every instance of studying throughout the day.

It is essential that you keep an accurate and honest record of all your study times during the day. It is also important that you make entries in your daily study diary on a continuous basis, and that you do not include in your diary any instances in which you do not actually study. Since no one other than I will ever see your study diary, you can be assured that the information contained in it will be treated confidentially. Thus, however much you may find yourself studying, you should feel no reluctance to record and report your study times honestly and faithfully.

The study diary is an integral part of the "Self-Improvement of Studying" Program. Such a study record is extremely valuable in that it provides you with useful information about your studying behavior and simultaneously serves as an excellent means of evaluating the study program.

Maintaining accurate and reliable records of study behavior represents a fundamental requirement of the program. No records or faked records are more damaging to the program than accurate records which show no benefits arising from the use of the study manual, since negative results can lead to improvement of the manual whereas false results are misleading. The importance of keeping records of your study and academic behavior cannot be overemphasized, for such records represent the most objective means of evaluating the impact of the study manual.
Turn in your study diary every week (on Monday morning), and at the same time pick up a fresh diary for the forthcoming week. Please make every effort not to misplace or lose your diary. If you should do so, however, continue your recording of study times on any available paper and transfer this information to a new diary as soon as possible.
"Self-Improvement of Studying" Program

Commitment Contract

I, the undersigned ____________________________ hereby agree to participate fully in the "Self-Improvement of Studying" Program during the entire current quarter. I commit myself to undertaking all necessary effort in fulfilling the following specific requirements of the study program:

(a) I will read carefully the study manual within two days of receiving it;

(b) I will follow systematically the instructions in the study manual regarding the self-application of methods for improving my studying;

(c) I will keep an accurate and ongoing record of my daily studying behavior, my self-application of suggested study methods, and my weekly quiz and exam scores;

(d) I will turn in all of these records once a week (every Monday); and

(e) I will complete a number of questionnaires and inventories at the beginning and ending of the program.

I promise to continue to engage in all the above behaviors throughout the duration of the study program, lasting from November 4, 1974 to January 19, 1975.

____________________________________  ______________________________
Date                                  Program Participant

____________________________________  ______________________________
Witness                                Program Director
APPENDIX E
PARENTAL APPROVAL FORM

IOLANI SCHOOL
Honolulu, Hawaii 96814

Office of the Headmaster

November 4, 1974

Dear Iolani Parent:

Your son has expressed an interest in participating in a self-instructional study program designed to improve his study habits and enhance his academic performance. This study program is being offered to interested Iolani students as part of a Ph.D. dissertation by Walter Fo, a doctoral student in Clinical Psychology at the University of Hawaii. Mr. Fo, an alumnus of Iolani, had asked to use Iolani School as the setting for developing and evaluating a study manual for instructing students in effective study skills. Since all Iolani students could profit from exposure to helpful study methods, I had few reservations in bringing the study program to the attention of students.

As is routine in matters such as this, Iolani requests that—should you concur in your son's decision to participate in the study program—you indicate your approval (a) in allowing Mr. Fo to administer a number of questionnaires and personality tests to your son; (b) in granting Mr. Fo access to your son's coursework and academic records, with which to evaluate his improvement in the program; and (c) in permitting Mr. Fo to publish the research results in a manner that ensures all students' anonymity. Mr. Fo has assured me that all such information pertaining to individual students will be treated confidentially; no one other than he will be given any personal information.

Mr. Fo is working under the auspices of the Department of Psychology of the University of Hawaii. His dissertation advisor is Dr. Clifford R. O'Donnell, Associate Professor of Psychology.

Finally, Mr. Fo has offered to share his research findings with Iolani School at the conclusion of the program. At that time, it is possible that certain particularly effective aspects of the study program may be implemented as an integral part of the school program. I welcome this opportunity to enhance the Iolani program.

Sincerely,

David P. Coon
Headmaster
"Self-Improvement of Studying" Program

Parental Approval

I hereby grant permission to Iolani School to allow my son, __________________________, to participate in the study program conducted by Walter Fo. I also give my approval for Iolani School to permit Mr. Fo:

(a) to administer a number of questionnaires and personality tests to my son before and after the study program;

(b) to have access to the coursework and academic records of my son during the current academic year; and

(c) to publish the results of his study in a manner that ensures my son's anonymity.

I understand that all such information pertaining to my son will be treated with the strictest confidence by Mr. Fo; no one other than he will be given any personal information regarding my son. In addition, I understand that Mr. Fo will not provide the individual results of my son's personality tests to Iolani School or to anyone else without my expressed (written) permission.

__________________________
Parent's Signature

__________________________
Date
APPENDIX F

SAMPLE PAGE OF STUDY DIARY

"Self-Improvement of Studying" Program

Study Diary

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APPENDIX G
PRETREATMENT QUESTIONNAIRE

"Self-Improvement of Studying" Program

Information Sheet

This enrollment sheet requests background information from you. All information on it will be treated confidentially. Be assured that the information contained herein will not be disclosed to anyone at Iolani.

Name ____________________________   Home Telephone __________

Grade _______   Age _______

Homeroom _________   Ethnic Group ______________

Grade first attended Iolani _________

Grade point average last quarter (expected) _______

Cumulative grade point average at Iolani (estimated) _______

Approximate average hours of study per week last quarter

Average _______

Approximate range in hours of study per week last quarter   Low___ High___

Have you attempted to improve your studying or study habits on your own previously? _____ If so, when? _________ Results? _________________________

Have you participated in a study improvement course or program previously? _____ If so, when? _________ Details? _________________________

In your judgment, how much motivation, or desire, do you have to improve your study habits? (Check one)

Very little ____ A little ____ Some ____ A lot ____ Really a lot ___

In your judgment, how much willpower, or self-control, do you have over your studying behavior? (Check one)

Very little ____ A little ____ Some ____ A lot ____ Really a lot ___

How much do you want to increase your time spent studying? (Check one)

Very little ____ A little ____ Some ____ A lot ____ Really a lot ___

How much anxiety do you experience when you are studying? (Check one)

Very little ____ A little ____ Some ____ A lot ____ Really a lot ___
List your course schedule for the current quarter. Estimate the average number of hours per week of outside-class study time that you expect to spend on each subject. Estimate the grade you expect to receive in each subject. Indicate free periods.

<table>
<thead>
<tr>
<th>Period</th>
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<th>Days of Week</th>
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<th>Estimated Study Time</th>
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APPENDIX H
POSTTREATMENT QUESTIONNAIRE

"Self-Improvement of Studying" Program

Research Questionnaire

Please respond honestly to the following questions.

1. Did you record accurately and continuously all study times in your diary?
   never__ seldom__ sometimes__ most times__ always__

2. Did you forget to record any of your study times in your diary?
   never__ seldom__ sometimes__ most times__ always__

3. Did you record in your diary any study times in which you did not actually engage in studying?
   never__ seldom__ sometimes__ most times__ always__

4. Did you read all of the study manuals which were given to you?
   never__ seldom__ sometimes__ most times__ always__

5. Did you actually apply the study methods suggested in the manuals?
   never__ seldom__ sometimes__ most times__ always__

6. Did you continue over time to apply the study methods suggested in the manuals?
   never__ seldom__ sometimes__ most times__ always__

7. Did you read any of the study manuals which were given to your classmates in the program?
   never__ seldom__ sometimes__ most times__ always__

8. Did you discuss any of the study methods contained in the manuals with other participants in the program?
   never__ seldom__ sometimes__ most times__ always__
9. How much did you find the material in the study manuals relevant to your needs as a student?
    very little___ a little___ some___ a lot___ really a lot___

10. How much did you benefit from participation in the study program?
    very little___ a little___ some___ a lot___ really a lot___

Any comments you may have about the program are welcome:
APPENDIX I
SEMANTIC DIFFERENTIAL

"Self-Improvement of Studying" Program
Evaluation Questionnaire

The purpose of this questionnaire is to measure the meaning of certain things to various people by having them judge them against a series of descriptive scales. In completing this questionnaire, please make your judgments on the basis of what these things mean to you. On the next page you will find a situation to be judged, followed by two sets of scales. You are to rate the situation on each of these sets of scales.

Here is how you are to use these scales:

If you feel that the situation at the top of the page is very closely related to one end of the scale you should place your check-mark as follows:

fair X: _____: _____: _____: _____: _____: _____: unfair
or
fair: _____: _____: _____: _____: _____: _____: X: unfair

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

strong: _____: X: _____: _____: _____: _____: weak
or
strong: _____: _____: _____: _____: X: _____: weak

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

active: _____: _____: X: _____: _____: _____: passive
or
active: _____: _____: _____: _____: X: _____: passive

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

safe: _____: _____: _____: X: _____: _____: _____: dangerous
IMPORTANT: (1) Place your check-marks in the middle of spaces, not on the boundaries:

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<thead>
<tr>
<th></th>
<th></th>
<th>X</th>
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<tr>
<td>this</td>
<td>not this</td>
<td></td>
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(2) Be sure that you check every scale for every situation. Do not omit any.

(3) Never put more than one check-mark on a single scale.

Make each item a separate and independent judgment. Work at fairly high speed. Do not worry or puzzle over individual items. It is your first impressions, your immediate reactions about the items, that we want. On the other hand, please do not be careless, because we want your true impressions.

1. How do you feel about the following situation in terms of the set of scales provided?

YOU ARE PREPARING TO TAKE AN EXAM IN ONE OF YOUR COURSES.

<table>
<thead>
<tr>
<th>Word</th>
<th>Scale 1</th>
<th>Scale 2</th>
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</tbody>
</table>

2. How do you think about the following situation in terms of the set of scales provided?

YOU ARE PREPARING TO TAKE AN EXAM IN ONE OF YOUR COURSES.

<table>
<thead>
<tr>
<th>Word</th>
<th>Scale 1</th>
<th>Scale 2</th>
<th>Scale 3</th>
<th>Scale 4</th>
<th>Scale 5</th>
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<tbody>
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</table>
Dear Participant:

You have in your possession a do-it-yourself study manual designed to help you attain greater self-control over your studying behavior. By following the step-by-step sequence of instructions contained in the manual, you can make studying easier as well as more rewarding for yourself. Of course, the ultimate aim is that your self-improvement efforts will lead to enhanced academic performance and better grades.

Studying effectively and efficiently is something you can learn to do. However, make no mistake: it is not easy to study well, as effective studying is a complex skill which is acquired only with considerable practice and effort. The effort required in studying cannot be magically eliminated, for there is no way to take the hard work out of studying. Nevertheless, as in learning to play tennis or piano, practice can be fun at the same time as it is a lot of work. Moreover, the work involved in acquiring a critically important skill such as studying yields enormous pay-offs, including more effective learning, more efficient use of time, improved grades, and greater self-esteem.

As in any self-improvement endeavor, it is you who must do the work if success is to be attained. The study manual cannot do the required work for you; it can only direct you to apply your efforts in constructive ways. In addition, however, the manual can show you how to go about making your day-to-day studying less effortful and more under your self-control.

In short, it is possible to make studying a more rewarding experience for you than it is presently. The purpose of this study manual is to explain just how. Read it carefully and thoughtfully. Most importantly, you must actively apply the study methods suggested in the manual if you are to learn to study more effectively and efficiently.

Best wishes to you in this exciting self-improvement endeavor.

Aloha,

Walt Po
SELF-IMPROVEMENT OF STUDYING:
A SELF-INSTRUCTIONAL MANUAL

Adapted from

STUDY SKILLS
by
William R. Higa & Charleen A. Higa

and

SELF-IMPROVEMENT OF STUDYING: A MANUAL
by
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Edited by
Walter S. O. Fo
PART I

KEEPING STUDY RECORDS

Introduction

The topic of self-improvement has become a major interest of recent research in psychology. One important finding of this research has been a surprising one: keeping accurate record of one's own behavior helps any self-improvement program. Whether you are trying to lose weight, run a faster mile, or improve your studying, a simple technique that will produce great improvement is to keep accurate records of your progress. Simply recording how much you study tends to actually increase the amount of time you do study.

This fact may not be very obvious to most of us. But apparently this is one of the reasons why a "New Year's Resolution" approach to self-improvement does not work. It does not include any system for finding out exactly how you are doing. If you want to know whether or not you are really improving, you must have a system of feedback. Record keeping does just that—it gives you accurate feedback on the results of your efforts. It would be very difficult for a person to diet if he does not have a scale for weighing himself. It would also be difficult for a track runner to run faster if he does not know how fast he ran before. In the same way, it would be difficult for you to improve your studying if you do not know how much you're studying. By keeping accurate records of your studying, you provide yourself with a good system of feedback with which to judge how well you're doing in your study efforts.

A final reason for keeping records is that it clearly directs your attention to the realities of your studying. Few of you are very good observers of your own behavior: you are much too busy living life to be also watching it. Failing to observe your own behavior, however, can be unfortunate if you are trying to really improve something. It is too easy for the dieter not to notice the little candy bar that he ate. It is too easy to think: "It seems like I really studied a lot more this week." It is all too easy to forget what you did or didn't do. This situation can be avoided by keeping accurate records of your own behavior on an ongoing basis, because the records will tell you exactly what you did.
Procedures for Keeping Records of Studying

A system for keeping records on your studying is presented in the following pages. This record-keeping system is elegantly simple and can be used conveniently by you. It consists of two components—the Study Diary and the Study Graph. The Study Diary is used to record the amount of time which you spend in studying each day. The Study Graph is used to chart your progress in improving your studying over an extended period of time.

Study Diary

You are requested to keep a continuous record of your studying behavior throughout the duration of your study program. A daily study diary is given to you for this purpose. You are to carry it with you wherever you might study throughout the day. When you do study, simply make an entry of the subject studied, the time you started studying, the time you stopped studying, and the number of minutes studied. In this way, you are to record every instance of studying throughout the day.

It is essential that you keep an accurate and honest record of all your study times during the day. It is also important that you make entries in your study diary on a continuous basis, and that you do not include in your diary any instances in which you do not actually study. Since no one else will ever see your study diary, you can be assured that the information contained in it will be treated confidentially. Thus, however much you may find yourself studying, you should feel no reluctance to record and report your study times honestly and faithfully.

The Study Diary is an integral part of your self-improvement of studying program. Such a daily study record is extremely valuable in that it provides you with useful information about your studying behavior and simultaneously serves as an excellent means of evaluating your attempts at study self-improvement.

Maintaining accurate and reliable records of study behavior represents a fundamental requirement of any study self-improvement program. No records or faked records are more damaging to you than accurate records which show no benefits arising from your efforts at study self-improvement, since negative results can lead to improvement of your study program whereas false results are misleading. The importance of keeping records of your studying behavior cannot be overemphasized, for such records represent an objective means of evaluating your success in enhancing your academic performance.

You are to turn in your study diary every week and at the same time pick up a new diary for the forthcoming week. Please make every effort not to misplace or lose your diary. If you should do so, however, continue your recording of study times on any available paper and transfer this information to another diary as soon as possible.
Recording in the Study Diary

In using your study diary, follow this sequence of steps:

Step #1: In the front of the diary, write your name along with the week of your recordings. Each week's recording runs from Monday through Sunday (e.g., Mon., Nov. 18 - Sun., Nov. 24).

Step #2: Carry the diary with you everywhere that you are likely to do some studying. Always take the diary with you wherever you might study. You may keep it with those study materials which you frequently use, such as your loose-leaf folder or notebook. Or you may simply carry the diary with you in your pocket, as it is pocket size.

Step #3: Make an entry in the diary for every instance of studying throughout the day. Record as study time any and all activity (with the exception of class meetings) involving any of your courses, such as reading textbooks, reviewing for exams, writing term papers, preparing speeches and oral presentations, working on special assignments and projects, and editing and rewriting lecture notes. Do not include class time unless the instructor gives you study time in class. In short, record all instances of studying on your own.

Step #4: Begin each new day of recordings on a fresh page of the diary, and circle the day of the week at the top of the page. Some of you may have many entries per day, while others of you may have few entries, depending on your study pattern. Use as many pages as you need for each day.

Step #5: In the first column labeled "subject," indicate the course studied. In recording the subjects, use abbreviations.

Step #6: In the second column entitled "time started," write in the precise time you started to study. That is, "punch in" when you begin to study, as an employee punches in his time card when he arrives at work.

Step #7: In the third column entitled "time stopped," record the exact time you stopped studying. That is, "punch out" when you cease to study, as an employee punches out his time card when he leaves work.

Step #8: In the fourth column labeled "study minutes," enter the number of minutes spent studying for each entry. Calculate the amount of study time for each recorded instance of studying by subtracting the time you started from the time you stopped. Then tally the total amount of study time for the day by summing all of the day's entries.
Step #9: Do not count as study time any instance in which you do not actually study. Keep a strict, honest count of how much you actually study. Suppose you arrive at your desk at the library at 1:00 and study consistently until 1:20, at which time you get up to visit the restroom, returning at 1:30 when you renew your studying again. Do not count as study time the period from 1:20 to 1:30. Similarly, if after you "punch in" your friend comes over to chat with you, you ought to "punch out" when he interrupts you and "punch in" again when you go back to your studies after he leaves. Likewise, do not include in your diary any time spent daydreaming while studying. Now, everyone's attention wanders sometimes. We're not suggesting that if you daydream for 60 seconds, you carefully deduct that minute from your study time. We are suggesting that you do not fool yourself: if you spend a great part of a 10-minute period doing something other than studying, you are fooling yourself if you record that time as 10 minutes of studying. In fact, one reason why this kind of record keeping is helpful is that it allows you to find out what you do that interferes with concentrated studying. If many time periods which are scheduled for study sessions do not get recorded, then you have learned something about your own behavior which interferes with concentrated studying. If many time periods which are scheduled for study sessions do not get recorded, then you have learned something about your own behavior which interferes with studying. Accordingly, you can investigate for possible distractions that interfere with concentrated studying—and take corrective action.

Step #10: If you do not study at all during a given day, indicate "no study" on the page for that day. Record the next day's study time on the following page. Some of you may have many "no study" days while others of you may have few such days, again depending on your pattern of studying.

Step #11: If you do not have your diary with you when you are studying, record the necessary information on any available paper. Then transfer this information into your study diary as soon as possible. Likewise, if you lose or misplace your diary, continue your recordings of study times on a sheet of paper and transfer them later to another diary. In this way, no records of your studying are lost.

Step #12: Keep a running (ongoing) record of your study times; do not fall into the habit of forgetting to record your study times and then trying to remember them afterwards. If you try to remember several hours later just which times you were studying, you are almost certain to forget. Keeping a record of your studying in this manner is likely to be so difficult (and painful) that you are likely to quit your record keeping altogether.
Study Graph

Each day's recordings of study times in the Study Diary provides you with feedback on how much you studied on a particular day. You may also obtain feedback as to the amount of studying engaged in during the week by summing up the study times recorded in the diary across the seven days of a given week. If you want to look at your progress (or lack of progress) over a longer period of time, you may make a graph of your study time. This graph summarizes in a concise manner the information on your study times which you have recorded on the individual daily sheets of your study diary. It takes only a few seconds to translate the information in your study diary into graphical form. The resulting Study Graph is useful because it shows you the overall pattern of your studying over an extended period of time. It is on such a graph that feedback about your studying becomes most clear and helpful to you.

By maintaining your study graph, you can trace your improvement (or lack of improvement) across every week of the semester. In this way, you can provide yourself with a bird's-eye view of where you have been, where you are going, and how you are doing. If special events occur that affect your studying, be sure to note these events on your study chart. For example, the flu bug may strike you with the result that your study graph goes down; or a big exam may come up as a result of which your study chart climbs very sharply. Since these are unusual events that cause great fluctuations in the study graph, you'll want to make a note of them.

A certain amount of ups and downs in your studying will always happen. Nevertheless, effective study skills are regular habits. And keeping study records helps you to become more systematic in your studying. Such record keeping also helps you study more frequently and more efficiently.

Drawing up the Study Graph

In drawing up a study graph, several steps are taken:

Step #1: Tally the amount of study time recorded for each day of the week. Proceeding through each recorded page of the study diary, sum up each day's recordings of study times in order to obtain the Daily Study Time.

Step #2: Calculate the total amount of time spent studying during the week. Since each study diary covers a period of a week (Monday through Sunday), the Weekly Study Time may be obtained by summing the daily study time across the seven days of the week.

Step #3: Compute the average amount of studying per day for the week. By dividing the weekly study time by the number of days of the
week for which study records were maintained, the **Average Daily Study Time Per Week** may be obtained. This procedure accounts for days for which recordings of study time were not kept, by excluding such days from the calculations. That is, while those days for which the recorded study time was zero (0) are included in the computations, those days for which there was no record of study times are explicitly excluded. In addition, school holidays and vacations are excluded from all calculations.

**Step #4: Transfer the resulting information on average daily study time per week onto the study graph.** The vertical axis of the study graph represents the average amount of study time per day per week, while the horizontal axis corresponds to the weeks of the school year. Simply plot the points on your study graph by finding the appropriate week of the school year on the horizontal axis and then moving up the vertical axis to the level corresponding to the computed average daily study time for that particular week. Place a dot (.) at the appropriate points across the various weeks of your self-improvement program. Then connect these dots with a dark line showing your progress over time.
PART II
SELF-DIRECTED STIMULUS CONTROL

Introduction

You've probably realized that some of your behaviors have become habits in certain places. For example, when you go to a football game, certain behaviors are almost automatic—whether the team is winning or losing, you yell and cheer or moan and groan. In the same way, many kinds of behavior are habit-like and controlled by the place.

You've probably also noticed that some of your behaviors have become habits at certain times of the day. You get up at a certain time, you go to work or attend class at a certain time, and you get home at a certain time each day. While there may be changes from day to day, many of your behaviors are habitual and controlled by time.

Finally, you've probably realized that some of your behaviors have become habits because of other behaviors you engage in. Going to your classes in the morning depends upon an earlier behavior—actually getting yourself out of bed. In the same manner, getting to the library to study depends upon whether you leave immediately after class and walk directly to the library or take a detour to the student center for a coke. In other words, certain behaviors become automatic because of other behaviors that happen before them.

All of these cases are examples of a well-established principle of psychology called stimulus control. What this means is that certain things in your life come to set into motion certain behaviors. The place, time of day, and other behaviors that occur—all of these things set into motion (i.e., they control) certain of your behaviors so that they appear habitual, or automatic. An important characteristic of habitual behavior is that it is quite easy to get started—just the place, the time, or another behavior is enough to set into motion the habitual behavior. Thus, you can arrange or alter the conditions that influence whether certain behaviors take place. You can arrange or alter the conditions that influence whether certain behaviors take place. You can set up or change the place in which the behavior occurs, the time at which the behavior occurs, and other behaviors that occur just before the behavior. In other words, you can control your own behavior by the conditions that you arrange in your own life.

Accordingly, since studying is a behavior just like any other behavior, you can set up conditions so as to make studying into a habit. You can make serious and concentrated studying almost
automatic, so that studying becomes fairly easy to get started and continue doing. How do you do this? . . . by learning to apply the principle of stimulus control to studying. That is, you use the principle that certain things in your life make studying more likely to occur. What are these "certain things"? They consist of three things related to studying: study place, study time, and study behavior. Study place refers to the places where you do your studying, study time refers to the times when you do your studying, study behavior refers to those behaviors that occur prior to actual studying. This manual will discuss each of these factors and provide suggestions (in the form of rules) for making concentrated studying easier and more likely to occur.
UNIT 1
STUDY PLACE

Rules Governing Use of Study Place

This section discusses study procedures for improving your chances of actually engaging in study behavior—ways of getting yourself not only to begin studying but also continue studying efficiently and effectively. These study procedures are presented in the form of the following four rules, all of which deal with the place where you study:

(1) Have one regular place where you do all of your studying.

(2) Have only necessary study materials and tools in your study area.

(3) Eliminate auditory and visual distractions.

(4) Avoid disorganization.

Let's review each of these rules in turn.

Rule #1: Have one regular place where you do all of your studying.

The first rule states that you should have one place, and one place only for studying. The idea behind this rule is that you will develop the habit of actually studying when you are in that place. By following this rule, you can expect that merely being in your regular study area will cause you to study. Moreover, you will not be wasting time and effort trying to find some place to work. The only effort will be to get yourself to that regular place. Once there, you will find that studying will begin almost automatically.

How to choose a study place? Research has consistently demonstrated that the library is one of the best places to study. After all, the library is built specifically for scholarly activity. There are generally fewer distractions and less temptation to put aside your studying in the library than anywhere else. Also, the reference materials needed for homework assignments are often available only at the library.

However, more likely than not, you may find it necessary to have two places to do your studying. For example, you may not be able to
go to the library at night or you may want to study when the library is closed. Thus, you may find you need to do some studying at home. If so, be sure to use only these two places for studying and no others.

**Rule #2: Have only necessary study materials and tools in your study area**

A little common sense will tell you what you should have in your study place and what you should not have. Anything present in your study area that is a temptation not to study should be excluded, since it will do just that—tempt you not to study. Conversely anything that helps you to study should be included in your study area. Check through the lists below:

**THINGS TO HAVE**

<table>
<thead>
<tr>
<th>IN YOUR STUDY AREA</th>
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<tbody>
<tr>
<td>desk</td>
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<td>chair</td>
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<tr>
<td>lamp</td>
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<tr>
<td>bookcase</td>
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<tr>
<td>typewriter and typing paper</td>
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<tr>
<td>dictionary</td>
</tr>
<tr>
<td>thesaurus</td>
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<td>stapler and staples</td>
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<tr>
<td>pens and pencils</td>
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<tr>
<td>paper clips and rubber bands</td>
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<tr>
<td>textbooks</td>
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<tr>
<td>reference books</td>
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**THINGS NOT TO HAVE**

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<thead>
<tr>
<th>IN YOUR STUDY AREA</th>
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</thead>
<tbody>
<tr>
<td>people</td>
</tr>
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<td>bed or couch</td>
</tr>
<tr>
<td>telephone</td>
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<tr>
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<td>pin-ups</td>
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<td>mementos</td>
</tr>
<tr>
<td>novels</td>
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<tr>
<td>dart board</td>
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<tr>
<td>chess set</td>
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</table>

These lists should give you a general idea of the kinds of things that should be present and absent from your study place. You can probably think of a lot more items that should be included in these lists.

**Rule #3: Eliminate auditory and visual distractions**

Auditory and visual distractions refer to sounds and sights that take your attention away from your studying. These distractions tend to reduce your study effectiveness and efficiency by hurting your ability to concentrate. So, the third rule regarding your study place is to remove all auditory and visual distractions. These distractions come from sources both inside and outside your immediate study area.

**Inside noise.** Although many students defend the practice, most experts criticize studying with the radio, television, or phonograph turned on. There are, of course, a few students who study with the radio, TV set, or stereo turned on and still manage to make good grades. However the sounds from such sources are for the purpose of
relaxation, enjoyment, and entertainment, and they therefore tend to take your concentration away from your studying. The radio, television, and stereo are thus inappropriate to have in your study area—it is even worse to have them turned on!

Outside noise. Noise that occurs inside or within your study area can be controlled by you—by turning off the radio, television, or stereo set. Noise that occurs outside your study area is more difficult to control. Such sounds as an exciting football broadcast from a neighboring room, traffic noise from the street outside your window, and chatting of students at a nearby table at the library—these are outside noises over which you have little or no control. What to do about these sources of outside noise? This is a particularly difficult problem because you usually cannot eliminate such noise. While you may be able to concentrate harder and block out the noises, the extra effort may just tire you and cause you to stop studying earlier than you had planned. If you cannot remove the source of the outside noise, you may have to remove yourself instead. So, rather than being distracted by outside noise, (1) change your study place to a quieter area, or (2) change your study time to a quieter time of the day. If you cannot do either, you may need to soundproof your study area or wear ear plugs. Whatever you do, eliminate outside noise as much as possible.

Inside sights. One major source of visual distractions comes from the surface of your study desk and the immediate surroundings. Your study area should be kept free of visual distraction such as favorite pinups, pictures of girlfriend, trophies, high school varsity letters, and psychedelic posters. Looking at these things may bring back pleasant memories or start you on a chain of distracting thoughts. As a result, daydreaming may take the place of studying. You must be especially careful to eliminate such distractions because they can utterly destroy your concentration by triggering off distracting emotions and thoughts. So, the thing to do is to simply remove all visual distractions from your study area.

You can eliminate unwanted visual distractions within your immediate study area quickly and easily in the following way. First, sit at your desk and face directly forward. Second, extend two imaginary lines, one left and one right, at 45-degree angles from your eyes to the wall in front of your desk. Third, remove everything not directly related to studying from the area included within the resulting triangle. Of course, you must continue to keep this area cleared of undesirable visual distractions or you will soon be back where you started. See the diagram for a pictorial description.
Outside sights. A second major source of visual distractions is created if your study desk faces a window or door, offering you a view of the outside. As a result, you may find that you have difficulty in concentrating on your studying. So, at all costs, eliminate this source of distraction by placing your desk away from any window or door. Also, if you have a classmate who studies with you in the same room, be certain that your desks do not face each other and are not close together. If they are, such a setup will more likely result in conversation than in study.

Rule #4: Avoid disorganization

The last rule on your study place deals with disorganization--a lack of organization in your study area can cause you to lose your concentration. One sure sign of disorganization is frequently interrupting your studying to do a number of things--sharpening a pencil, borrowing paper from a classmate, hunting for missing notes, searching for your textbook, and looking for a dictionary. Another sign of poor organization of your study area is physical discomfort, eyestrain, or sleepiness. In order to initiate and maintain good concentration, it is important to have your study place well organized for studying. This means you need to attend to two features of your study area: (1) working conditions, and (2) study tools.

Working conditions. A suitable chair and adequate working space are essential for effective and efficient study. You should sit in a straight-backed, comfortable chair while studying. A chair that is too comfortable will produce sleepiness, while a chair that is too uncomfortable will cause restlessness and physical discomfort. Reduced concentration is the result in both cases.

You should also avoid studying in bed or stretched out on a couch. Both positions are normally associated with relaxation, not with the mild tension required for concentrated work. Thus, if you try to study while lying down, you may find yourself relaxing too much--and falling asleep.

Lighting, both natural and artificial, should be evenly distributed over the desk surface and should not glare on your book or reflect into your eyes. Indirect lighting is better than direct lighting. Most reading lamps, especially the concentrated high-intensity type, when shown directly on your reading area will produce a glare and cause eyestrain, headache, and fatigue. To avoid this problem, use a fluorescent lamp whenever artificial lighting is needed for your study area.

Study tools. Do you often interrupt your studying in order to search for textbooks, a dictionary, sharpened pencils, or other study tools? Frequent interruptions to get needed items or to hunt for missing things can be avoided by systematic planning in equipping your study area.
The first step is to prepare a list of materials that you need for your studying. The next step is to obtain the necessary items and place them where they can be easily reached from your study desk. You may use a desk drawer for such things as paper, pencils, erasers, paper clips, etc. A small bookcase within your arm's reach might be desirable for your textbooks, notebooks, dictionary, etc. The final step is to return the study tools to their proper place after you use them so that you can find them readily again whenever you need them.
STUDY PLACE

Checklist

Yes___ No___ 1. Did you select two regular study places— one at school and the other at home— and then study only at these places?

Yes___ No___ 2. Did you decide what study materials and tools you need to have in your study area, and then obtain them?

Yes___ No___ 3. Did you identify irrelevant things in your study area that should not be there, and then remove them?

Yes___ No___ 4. Did you take note of any auditory distractions both inside and outside of your study area, and then eliminate them?

Yes___ No___ 5. Did you notice any visual distractions inside or outside of your study area, and then eliminate them?

Yes___ No___ 6. Did you check the working conditions and study tools in your study area for any signs of disorganization, and then remedy any problems to ensure that your study area is well-organized and well-equipped for studying?
STUDY PLACE

Worksheet

By completing the steps that follow, you can help to ensure that your study area is properly arranged and equipped for effective and efficient studying. Please fill out this worksheet immediately after reading the unit on Study Place, using the space provided below. Return the completed worksheet to the box located in Mr. Yelas' secretary's office.

Completion Dates

1. Select two regular study places--one at school and the other at home--where you plan to do all your studying. Then study only at these regular study places.
   a. school study place: _____ b. home study place: ___

2. Make a list of study materials and tools that you need to have in your study area. Then obtain these needed study materials and tools.

3. Make a list of irrelevant things presently found in your study area that tempt you not to study. Then remove these temptations from your study area.

4. Sit at your study place and listen for any auditory distractions from sources both inside and outside of your study area. Then eliminate these auditory distractions.

5. Identify any visual distractions both within and outside your study area by sitting at your desk and using the visual triangle technique. Then eliminate these visual distractions.

6. Indicate any signs of disorganization in your study area, particularly in regard to poor working conditions and inadequate study tools. Then remedy these problems in working conditions and study tools to ensure that your study area is well-organized and well-equipped for studying.
Planning Your Study Time

During a typical semester, you have approximately 18 weeks in which to complete all of your required coursework. This total semester time amounts to about 125 days or 3,024 hours available time for studying. Obviously, you'll have less time than this since you must eat, sleep, work, and play. Regardless of what your time schedule is, you must make the best use of the hours set aside for studying and avoid unnecessary loss of time. If you're able to study four hours each day of the week, then you'll have a total of 504 hours of study time for the entire semester.

Most students, however, are unable to claim anywhere near 504 hours of total study time because of the unnecessary loss of valuable time. Do any of the following examples of wasted time apply to you?

You have an hour of free-time between some of your classes, but somehow you never get more than 15 minutes worth of work done during that hour; and more frequently you get nothing done.

You cannot decide whether to study English, practice for speech class, or read for history, so you fiddle a little with each assignment before deciding there is no longer enough time to do any of them after all.

You find that the library book you need is out on two-hour loan, so you chat with a friend until the book is returned.

You get involved in a discussion with friends about the upcoming gubernatorial election and there's no end to the conversation because of the heated feelings over the topic.

Sometimes, the days and weeks slip by in the same fashion, as in the following examples:

You do not want to wait in line at the library on Friday afternoon, so you do not take out the reserved reading material until noon on Monday.

You allow yourself four weeks after the beginning of classes to "get used to things" before bothering to crack a book.
You are the "kind of person who works best under pressure" so you wait until the pressure is really on . . . like the day before the exam.

You're waiting to see the instructor about something you don't understand in the course. He's busy talking with another student, so you decide to come back the following week.

All of these are illustrations of unnecessary loss of time . . . time loss that could have been avoided. In addition, there is unavoidable loss of time. For example, your car breaks down, and the entire afternoon is spent in repairing it. You are hit by the flu bug and remain sick in bed. You spend an evening comforting a classmate whose girlfriend just broke up the relationship. You loan a textbook to a friend who is late in returning it for your exam.

Thus, even though you may think you have an excellent plan for using your time, you may still find that you just "don't have time" to do all of the required work in your courses. This common complaint ("no mo time") of students may be the result of loss of valuable time from both avoidable and unavoidable sources. To make matters worse, students frequently tend to underestimate the amount of time required to do an assignment.

How can those problems be avoided? . . . by systematic and careful planning of the use of your available time for each day and week of the semester. There are two features of systematic planning: (1) planning the minutes and hours of each day of the week (week plan); and (2) planning the weeks and months of the semester (semester plan). Planning the week helps to avoid wasting time unnecessarily, while planning the semester helps to avoid last-minute cramming and all-night stands to complete term papers and prepare for exams.

In combination, both types of planning help provide time for leisure and non-academic activities without sacrificing the time required to complete all academic work on schedule. Because systematic planning gives you plenty of time that is really your own time, the time demanded by academic work becomes less bothersome and produces fewer emotional pressures. Your time can be used as you wish . . . for sleeping, surfing, TV watching, reading novels, going on dates, or digging more deeply into an academic subject that turns you on. In other words, careful and systematic planning will help you to feel secure in knowing (1) that enough time is planned for academic tasks that must be done without a last-minute rush; and (2) that enough time is available to do the things you want to do, without worrying whether you should be somewhere else doing something else.

Rules Governing Use of Study Time

This section presents some specific rules and steps to follow in constructing a sound study time plan for the week as well as for the entire semester.
The following eight rules for setting up your study time plan deal specifically with when and how to schedule your study sessions:

1. Have regular times for your study sessions.
2. Each study session should have a definite beginning and a definite ending.
3. Do not schedule study sessions at the same time as pleasurable activities.
4. Do not schedule study sessions after pleasurable activities that have no time limit.
5. Schedule study sessions for odd hours.
6. Schedule study sessions before participation-type courses and after lecture-type courses.
7. Schedule study sessions for the weekends.
8. Do not steal study time; borrow it.

Let's look at each of these rules more carefully.

Rule #1: Have regular times for study sessions

This rule states that you should have certain times during each day of the week when you do your studying. These study times may be at different hours of the day for different days of the week. The important point is regularity. You should have times for studying that are regular. For example, you may plan study sessions at 8:00 a.m., 1:00 p.m., and 7:00 p.m. on Mondays, Wednesdays, and Fridays, and other study sessions at 10:00 a.m., 2:00 p.m., and 6:00 p.m. on Tuesdays and Thursdays. The important thing is that you set aside fixed and clear times for your study sessions.

Rule #2: Each session should have a definite beginning and ending

This rule may sound a bit silly but it is important. Your time for studying should always have a regular starting point and a regular stopping point. For example, if you plan a study session on Tuesday from 11:00 to 12:00, you should be at your regular study place at 11:00 and ready to begin studying. In addition, since your plan calls for ending the session at 12:00, you should stop studying at 12:00. The reason for this rule is simple. If you don't have a definite starting point for your study session, you may be tempted to continue what you were doing before the planned session. If your study sessions don't have a clear end-point, you may find yourself wasting valuable time during the session, thinking that you have lots of time. If you know that you are going to stop at a definite time, you can work with greater concentration during the study session. Moreover, using Rule #2 can result in an important benefit to you: at the end of your study session, you can stop studying with a clear conscience. You have started studying on time, you have done the work, and you have ended the session as planned . . . you can then relax and enjoy the period after.

Rule #3: Don't schedule study at the same time as pleasurable activities

This rule states that you should not schedule study sessions at the
same time that other, more pleasurable activities are going to take place. You want to get rid of all competition for your studying. Do not plan your sessions at times when you will be tempted constantly to do something else that's more enjoyable or exciting. For example, in scheduling your study sessions, you might remember that Wednesday from 9:00 to 10:00 a.m. is the only time during that day when you can talk with your best friend. Don't plan a study session for that hour because talking with your friend is an activity that will nearly always win over studying. If you plan study sessions at the same time as pleasurable activities, two things are likely to happen: (1) you probably will not stick to your plan; and (2) even if you are able to stick to the plan, you may find it hard to concentrate on studying and may begin to feel that school is all work and no fun. In order to prevent these things from happening, you should plan your study sessions around pleasurable activities . . . plan on studying at times other than when fun activities usually take place.

Rule #4: Don't schedule study after pleasurable activities with no time limit

In planning study sessions around pleasurable activities, be sure that the study sessions do not follow the fun activities. In other words, Rule #4 states that you should avoid scheduling study sessions just after pleasurable activities that can go on and on. The reason for this rule is the same: the fun activities will compete with studying. In most cases, the fun activities will tempt you to continue playing and thus prevent you from starting your study sessions. For example, if you have lunch with a friend on Thursdays from 12:00 to 1:00 p.m. and sometimes talk for an hour or sometimes two hours, do not schedule a study session that begins at 1:00 p.m. If you do, two things are likely to happen: (1) you very likely will not stick to your plan; and (2) as you are engaging in the pleasurable activity, you may worry about your studies and feel guilty that you're not studying. For these reasons, plan on having study sessions before pleasurable activities . . . not after or at the same time. Or if you must schedule study sessions after pleasurable activities, be absolutely certain that there is a definite end to the fun activity . . . be sure that you can and will stop having fun at a certain time, so that you can begin your study session.

Rule #5: Schedule studying during odd hours

This rule tells you to use, whenever possible, any odd hours in your day for studying. There may be one or two scattered here and there throughout your day that you may consider free time. For example, you may have an hour between classes, two hours waiting for a ride home, a free hour because a class is cancelled, a half hour before dinner is served, etc. These hours can be easily wasted and forever lost. The rule states that you should use these hours for your regular study sessions. This is especially true during the day when you're on campus and have available time between classes. Use these free intervals for studying and plan on regular study sessions at these times.
Rule #6: Schedule study before participation classes and after lecture classes

In planning study sessions during the day between classes, be sure to follow this rule with regard to participation-type and lecture-type classes. Participation courses such as foreign language, math, or speech require you to be actively involved in the class activities—translating words, solving problems, or giving speeches. For this reason, you should plan a study session just before the class to review your assignment and prepare yourself. Lecture courses such as history, philosophy, or economics require you to be actively involved in listening to the instructor's lectures. Accordingly, you should plan a study session just after the class in order to edit and rewrite your lecture notes.

Rule #7: Schedule study for the weekend

Everyone looks forward to the weekend... and with good reason, since that's the time for relaxation, recreation, and "good fun." Nevertheless, you should plan some study sessions during the weekend for two reasons. First, the weekend is a good time to work on special projects that require a lot of time... projects such as writing a term paper or preparing a speech that involve the use of library materials. Second, it's a good idea to plan on a study session over the weekend, in the event that you may have fallen behind in any of your assignments.

Rule #8: Borrow time; don't steal it

This rule deals with situations in which unexpected things happen that take away the time you had planned for studying. For example, you're walking toward the library and see a good friend whom you haven't seen for awhile... so you stop to talk and miss your study session. Or you have a doctor's appointment for 4:00 p.m. and plan a study session at 5:00, but you find you're still waiting to see him at 4:55... resulting in further loss of study time.

Since many of these interruptions in your study plans may be to engage in pleasurable activities, you sometimes won't mind the loss in study time. On the other hand, you may sometimes feel guilty or frustrated for not studying as planned... that is, while you're engaging in the unexpected you may have thoughts like "I really shouldn't be doing this," "I really should be studying," or "I've had it; it looks like I'm not gonna study today at all!"

In order to avoid feeling guilty or frustrated, you should follow the rule in regard to borrowing time. That is, when unexpected disruptions in your study plans occur, you should immediately begin planning how and when to make up for the lost study time. Look at your regular time plan for the week, and figure out when you can make up for the lost time. Once you decide when to make up your study time, you may (1) feel more relaxed and free to enjoy the interruption, knowing that you'll be able to make up the time being lost; and (2) avoid the reaction of not studying at all for the day, since you know that while you cannot prevent the unexpected from
happening, you can make up for the lost time.

Drawing Up a Time Plan for the Week

The last section presented rules for scheduling your study times. This section describes the six steps involved in drawing up a systematic time plan for the week. The plan specifies the times that you will be doing everything in the course of living your life during the span of a week . . . encompassing every hour of the day and every day of the week.

Step #1: Record essential living activities. Allow enough time, but not excessive time, for activities that are necessary for daily living. These activities include eating, sleeping, dressing, and bathing.

Step #2: Record fixed time commitments. Set aside those hours for activities and events that you must attend. These activities include your classes, labs, employment, household chores, church services, etc.

Step #3: Schedule your study sessions. Specify the times for studying in your regular study place. In doing this, be sure to follow the eight rules for scheduling study times . . . and be certain to plan enough study time to meet the demands of your courses.

Step #4: Schedule some flexible times. Indicate those hours that are not assigned to specific activities and are thus free to handle unusual events. These events fall into two categories: (1) as previously discussed, there may be unexpected events that rob you of your planned study sessions for which you need flexible times to make up the lost study time; (2) there may be periods during the semester when you have to put in extra study time, especially in reviewing for exams and preparing for term papers.

Step #5: Schedule recreation time. Block off specific times for recreational activities such as television watching, relaxing, reading newspapers, going on dates, surfing, and shopping. As you schedule these fun activities, be sure to use the rules discussed earlier . . . especially Rule #3 (don't plan on fun at the same time as study), Rule #4 (don't plan on fun before study), and Rule #7 (don't plan on only fun during the weekend).

Step #6: Post your plan where you can frequently see it. After you have followed these steps in filling in all of your activities, you will have completed a plan for the week that is systematic and well-thought out . . . provided you have followed the eight specific rules for scheduling regular study sessions. When you have a systematic time plan for the week, the final step is to make copies of it. Post these copies of your time plan where you will see them frequently . . . at your study desk, on your notebook cover, and on your bedroom dresser. Placing copies of your time plan where you'll see them will help you to remember what you should be doing at the time you should be doing it.
Drawing Up a Time Plan for the Semester

This section discusses overall planning for the entire semester. Such planning is necessary to avoid last-minute cramming and all-night stands to prepare for exams, complete term papers, or work up speeches. Note the difference between the week plan and the semester plan: the week plan guides your use of time from hour to hour and from day to day, while the semester plan guides your use of time from week to week and from month to month.

The semester plan is designed to provide you with a realistic picture of the total amount of work required by your courses throughout the semester. That is, the plan is actually a semester calendar on which you write all important dates and deadlines. In drawing up such a master plan for the semester, use the following six steps.

Step #1: Record all fixed academic deadlines and all official holidays. Write down all deadlines set by the school for academic actions that concern you. Also, indicate all state and federal holidays.

Step #2: Record all other fixed events. Write down all important deadlines and dates set by your instructors for your coursework. These deadlines and dates include (1) scheduled dates for taking exams, (2) scheduled deadlines for submitting term papers, and (3) scheduled dates for giving presentations in class. Some courses have neither fixed dates for exams nor deadlines for papers. In these cases, be sure to set your own deadlines so as to complete all course requirements by the end of the semester.

Step #3: Record reviewing dates for exams. After writing down all fixed dates for exams, fill in the dates when you will do the reviewing for the exams. Be sure that these review dates do not fall only on the day just before the exam. Such "cramming" for an exam is ineffective if you're doing the reading for the first time or if it is your only review period. While you should set aside the day before an exam for reviewing, be sure to spread out other review sessions over the week before the exam.

Step #4: Record starting dates for projects. After writing down the deadlines for term papers, presentations, and other special projects, put down the dates on which you will start each project. Be sure to give yourself enough time before the deadline to be able to complete the work.

Step #5: Record pleasurable events. After plugging in all of the important dates, then and only then write in the dates on which certain recreational events take place. These are the social events which you don't want to miss . . . such as the big football game, a great movie, the annual carnival, etc.

Step #6: Post the completed plan. After completing the master plan for the semester, make copies of it and post them where you'll see them. Keep one in your notebook and one at your study desk, so that you can see at a glance what's happening when.
STUDY TIME

Checklist

Yes___ No___ 1. Have you scheduled regular times for your study sessions?

Yes___ No___ 2. Does each study session have a definite beginning and a definite ending?

Yes___ No___ 3. Were you careful not to schedule study sessions at the same time as pleasurable activities?

Yes___ No___ 4. Were you sure not to schedule studying after pleasurable activities that have no time limit?

Yes___ No___ 5. Have you scheduled some study sessions for odd hours during the day?

Yes___ No___ 6. Have you scheduled study sessions before participation classes and after lecture classes?

Yes___ No___ 7. Have you scheduled study sessions during the weekend?

Yes___ No___ 8. Did you borrow time, not steal it, when unexpected events interrupted your study plans?
STUDY TIME

Worksheet

This worksheet is designed to help you to draw up systematic time plans for the week and for the entire semester. Attached are blank schedules—one labeled "Weekly Time Plan" and the other "Semester Time Plan." Set up your schedules on these time plans by following the steps listed below. By completing this worksheet, you will be structuring your study time more effectively with the result that studying may come easier for you. Please turn in your completed worksheet, along with your two time plans, to the box located in Mr. Yelas' secretary's office. Your time plans will be returned to you promptly so that you can post and follow them. Remember: if your study plan is to be of any benefit to you, you must stick to it!

### Weekly Time Plan

**Action Steps**

1. Write in times for sleeping and eating.
2. Block off times for your classes, household chores, and part-time work.
3. Schedule times for studying, keeping in mind the rules for planning study time.
4. Set aside free (flexible) times for handling unexpected events.
5. Specify times for recreation.
6. Post the weekly time plan on your notebook cover and at your study desk at home.

### Semester Time Plan

**Action Steps**

1. Record all school holidays.
2. Write in all course deadlines for term papers, class presentations, and exams.
3. Schedule reviewing sessions prior to exams.
4. Block off dates for working on term papers and special projects.
5. Indicate special recreational events.
6. Post the semester time plan on your notebook cover and at your study desk at home.
### WEEKLY TIME PLAN

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Rules Governing Study Behavior

The previous sections of the manual have shown you how to use study place and study time as a means of increasing your chances of actually studying. In this section, you will learn about the third factor that controls studying—the behaviors that happen before or at the same time as studying. You will learn about things you can do to increase your study effectiveness and efficiency...things you can do before and during your regular study times in your regular study places. These suggestions on how to increase the likelihood that you will study are given in the form of rules: four rules on what to do before your regular study sessions and eight rules on what to do during your regular study sessions.

Behavior Before Studying

The following rules concern specific things that you can and should do before beginning your regular study session.

Rule #1: Anticipate and avoid temptations that occur before studying.

This rule is similar to Rule #4 on planning your study time. Rule #4 on study time states that you should not schedule study sessions that take place subsequent to pleasurable activities, while the present rule on study behavior states that you should arrange to avoid temptations which occur just prior to your study sessions.

What kinds of temptations take you away from studying? There are many and you must guard against them...and the way to do so is to first know what they are and then prevent them from happening. For example, an obvious temptation involves walking to your regular study area (such as the library) with a good friend. Your friend may decide before arriving at the library not to study, and tempt you to do the same. If your friend enters the library with you, the temptation remains to chat with him. It's hard to tell a friend to go away so that you can go to your regular study place in the library...and if you don't get rid of your friend, you'll very likely find yourself "talking story" with him instead of studying. What to do about this situation? Avoid the entire set-up by simply anticipating and avoiding the temptation of walking to your study area with a friend.

Suppose you successfully avoid the temptation of walking with a friend to your study place. Are you then free of temptations? Maybe...then again, maybe not. For instance, there may be several available routes that you might take in walking to your study area. Some of them may lead
you through places where your classmates are gathered. These are routes you should avoid because they'll lead you right into nests of people who'll tempt you to forget studying.

These are only a few of the many temptations that stand in the way of studying as you had planned. You can easily think of others... seeing a paper football game played by some friends, walking by a television set showing a basketball game, or chatting with a classmate just as the class ends. These and other temptations are always present, inducing you to drop your plans for studying. The moment you expose yourself to these temptations, you've lost... since temptations involve activities that are more fun to do than studying. Accordingly, you must plan ahead to avoid temptations.

Rule #2: Take only what you planned to study to your study area.

Do you sometimes take two books to your study area—one book from an easy course (or one you like) and the other from a difficult course (or one you hate)? Although you plan to read the book you hate... you end up reading the book you like. The reason for this should be as obvious as the solution... take only that book for which you had planned a study session.

In addition, when you sit down for your study session, be sure that everything inside the imaginary visual triangle is directly related to what you had planned to study for the session. For example, if you planned to study English, be sure to have only materials related to that course inside the triangle... and materials from other courses completely outside the triangle. In this way, you can avoid the temptation of studying for courses that you had not planned on studying for that particular study session. In fact, the rule really applies to all your courses: when you go to your study place for a study session, take only what you plan to study and have only what you plan to study within your visual triangle.

Rule #3: Set up your study symbol.

You have probably had the experience of feeling formal and dignified when you've put on formal clothing such as a tuxedo. You may have also had the experience of feeling relaxed and casual when you've worn a pair of comfortable jeans or shorts. Similarly, you may have felt sleepy and drowsy when you've put on the pajamas that you usually wear to bed. These experiences simply mean that what you wear can influence how you feel and think.

Choose a special article of clothing that you will wear whenever you study. This is your study symbol. Put it on just as you start your study session... and take it off as soon as you end your study session. Don't wear it at anytime except when you're in your regular study place during your regular study session. After doing this for a while, you'll find that you'll feel more like studying as soon as you put on your study symbol. This is a great advantage for getting down to work.
There is another advantage in using a study symbol. Other people (e.g., family members, friends, and classmates) will know that they should not bother you when you have your study symbol displayed. They will know that you are involved in serious study and wish to be left alone. In addition, they will see to it that still other people will not disturb you—such as by calling on the telephone. They can tell the caller that you are busy and that you will call back later.

The study symbol can be a hat, puka-shell choker, wrist-band, ring, or any piece of clothing that's easy to put on and take off. You want something that you can immediately put on or display when you start studying and immediately take off or remove from display when you stop studying. Thus the study symbol does not have to be clothing...it can also be a printed sign. For example, you could make and display signs that say: "DO NOT DISTURB: THOUGHTS AT WORK," "DO NOT ENTER: MAD STUDENT AT WORK," "PLEASE DON'T WISH ME GOOD LUCK IN SCHOOL: JUST LET ME STUDY," "I THINK I'M STUDYING: PLEASE DON'T INTERRUPT ME UNTIL I FIND OUT," "DO NOT INTERFERE: LOVE AFFAIR WITH BOOKS IN PROGRESS," or "DO NOT ENTER: STUDY EXPERIMENT IN PROGRESS."

Rule #4: Keep a reminder pad available.

Some of you may find that as you are trying to study, you think about things you forgot to do or should remember to do later. Others of you find that you cannot concentrate on studying because you worry about the quarrel you had with your girlfriend, the argument you had with your parents, or the disagreement you had with your instructor. Such thoughts interfere with your concentration...they may interrupt your studying or prevent you from continuing to study, although you are in your regular study place during your regular study session.

Since these thoughts distract you from concentrated studying, they should be eliminated from your mind before you begin to study. How do you do this?...by keeping a small pad and pencil handy to write notes to yourself. Just write down reminders to yourself about things you forgot to do and must remember to do later...things like forgetting to return a book to your friend, forgetting to keep an appointment with your instructor, and remembering that you have a dental appointment next week.

The reminder pad should also be kept available throughout your study session. You may happen to think about something while you're studying. You'll want to write it down so that you can go right back to studying, knowing that when you look at the pad later, you'll be reminded of the things you have to do. Remember: the purpose of the reminder pad is to clear your head of distracting thoughts so that you can concentrate on the task of studying.

Behavior During Studying

Let's now consider eight rules on how to improve your concentration during your study sessions. Each rule is important in making sure that when you sit down to study, you actually do study.
Rule #1: Do only studying in your regular study place and study time.

In selecting a place for studying and in scheduling your study sessions, be sure not to engage in activities other than studying when you had planned to study. The reason for having a regular study place and regular study time is that you want your study behavior to begin almost automatically as soon as you enter your study area for your study time. However, this will not happen if you engage in activities that compete with studying.

This rule is absolutely vital. The study place and study time must be used for studying . . . and nothing else. The idea is to give your study area and study time the power to control your study behavior. It is important to set up the crucial link: study place/time = studying. If your study area is one in which you also eat meals, talk to friends, read magazines, watch television, listen to the radio, or sleep . . . if you do any of these things in your study place/time, you will break down the crucial link between study place/time and actual studying. Any competition with studying in your regular study place/time must be eliminated. Go someplace else to engage in non-studying activities.

Rule #2: Divide your study session into study intervals.

Some of your study sessions, especially in the evenings and on weekends, may be scheduled for long periods of three or more hours. For such long study sessions, it is advisable that you break down each session into shorter time periods (called "study intervals"). In other words, your study session should be divided into realistic, easy-to-handle units of time for studying.

The best way to set up study intervals for each study session is to find out the most effective study time for each of your courses. Effective study time refers to the longest time you can concentrate on studying without taking a break. You may find that this time differs for different courses. You may also find that the effective study time may vary depending upon the kind of study activity that is involved . . . for example, reading technical material such as a math textbook may take longer and tire you sooner than reading nontechnical material such as an English novel.

To find out your effective study time, first set up brief study intervals without a break. Then work up to progressively longer intervals for each type of studying that you must do and for each course that you have. By experimenting with your studying time in this manner, you should be able to arrive at a viable estimate of your effective study time for each course and for each kind of study activity.

Rule #3: Plan to take short breaks after study intervals.

After you decide on your study intervals, you should set up a system of taking short breaks from studying. This rule means that you should get up from the desk at the end of the study interval. There are a number of things that can be done during this short break from studying . . . such as...
getting a cup of coffee, making a quick phone call, taking a coke break, doing a few calisthenics, or stretching and walking around. The idea behind these breaks is that they will help to rest your mind and improve your concentration. After the break, you'll feel refreshed and ready to go.

Rule #4: Study hardest subjects first.

For a long study session in which you must study two or more subjects, start with the subject that is the most difficult or least interesting. There are three reasons for this rule: (1) at the start of the study session, your mind will be freshest and clearest; (2) during the study session, you can switch to a more interesting subject when you begin to feel fatigued; and (3) you can think of studying the easier or more interesting subject last as a reward for studying the more difficult or boring subject first.

Rule #5: Always study alone.

If you're like most students, you enjoy talking with others about anything and everything. In fact, "bull sessions" can be both pleasant and educational, but as pleasurable activities they compete with studying and thus should be avoided when you study. This means that you should always study alone in your study place during your study sessions. You should not study with friends, classmates, or family members.

This rule is very important. If you fail to observe this rule, you will more than likely have a difficult time concentrating and wonder why you can't study. There's no need to be puzzled... the answer is right next to you: your friends. Why do they make it hard for you to study? There are two basic reasons: (1) what do you usually do with friends when you're not studying? Right... you talk to them about academic as well as non-academic matters; and (2) even if you're able to resist talking with them, your friends will start talking to you. Having friends or classmates around has usually never been connected to serious studying in the past; instead, it has almost been connected with "good fun." Thus, these people are great to have around when it's time for fun, but they are in fact disastrous when it's time for studying.

There is only one time when it may be okay to study with others: after you have both studied the material, know the material very well, and want to do some reviewing for an exam. In this case, having others around may be okay... but remember: the activity is not studying material for understanding; it is engaging in testing each other about material you already know and the talking is serious conversation with the purpose of reviewing for an exam. In order for this to work, both of you have to make a clear agreement that you will be talking only for this purpose and that you will only do fun-type talking after your study sessions.

Rule #6: Be active when studying.

Too many students mistakenly think of studying as a passive process. The more passive you are, the more easily you'll be distracted by outside
noises or by your own thoughts not related to studying. The more actively you study, the better your concentration on studying. So when you study, study actively.

Rule #7: When daydreaming starts, turn away from books.

When most students find that they’re not concentrating, they usually continue to sit at their desk, stare blankly at their books, and tell themselves they’ve got to use more willpower. The only thing they achieve from all of this is a lot of wasted time. This method of dealing with the problem of daydreaming is almost guaranteed to fail. What’s worse is that this method results in another problem: if you daydream and continue to sit at the desk and stare at the books, what you’re doing is setting up an association between daydreaming and your study place. This means that the next time you try to concentrate in your study place, you may start daydreaming again . . . because the area has become associated with daydreaming.

What can you do about this common problem? First, you can apply the four rules on setting up your study place. That is, you should have only one regular study place, have only necessary study materials and tools in the area, eliminate auditory and visual distractions, and avoid disorganization. Second, you can apply the rules on scheduling your study time. That is, to prevent daydreaming, you should be using the following rules: have regular times for studying, have a definite beginning and ending for each study session, do not schedule studying at the same time as pleasurable activities, and do not schedule studying just after pleasurable activities with no time limit. Third, you can apply the rules on what to do before you begin your studying. That is, you should avoid temptations before studying, take only what you planned to study to your study place, set up your special study symbol, and keep a reminder pad handy to write down any thoughts or worries. That is, you should do only serious studying in your study place/time, divide your sessions into study intervals, take short breaks after each study interval, study the hardest subject first, always study alone and never with others, and always be active when studying.

In other words, to prevent daydreaming and a loss of concentration, you should apply all of the rules you’ve learned thus far. For many of you, following those rules may be enough . . . provided you use them correctly and consistently. For some of you, however, while the rules may help, you may still find yourself daydreaming. For these students, it is suggested you apply the rule of turning away from the books.

The rule states that, when you begin to daydream, you should turn and face away from the books. Turn to the opposite wall, count the cracks in the ceiling, look for dirt on the floor . . . do anything except look at your books.

Rule #8: Relax before you start to study.

If you are one of those students who have tried everything recommended
and still cannot concentrate on your studying, it may be that this final rule can help you to improve your concentration and eliminate your daydreaming.

First, ask yourself: "Does studying make me nervous?" If so, ask yourself "How do I react when faced with studying?" If you react physically by frequently leaving your study area to take "quick breaks" which turn into hours . . . or if you avoid going into your study area at all or almost always do something else besides studying when you had planned to study . . . or if you react psychologically by daydreaming or constantly thinking about other things, instead of concentrating on your studying . . . if you react in any of these ways, you may be suffering from study-anxiety.

Some of you may have noticed that when you open your books to begin studying, you feel nervous and anxious and then start to daydream to escape from these feelings of discomfort. Others of you may not even have noticed feeling anxious; you've been escaping and avoiding such anxiety so often by daydreaming that it has become almost automatic (i.e., a habit) for you to start daydreaming as soon as you begin to study.

The key to overcoming study-anxiety is to learn how to relax when studying. When you are physically and deeply relaxed, it is almost impossible to feel nervous or anxious at the same time. If you are in a completely relaxed state, you will certainly feel no anxiety about something as harmless as a book on your desk. A coiled rattlesnake on the desk, yes. But a book, no.

The basic idea is to learn a new connection between studying and how you feel. In the past, studying and books resulted in your feeling anxious. You must now learn to connect studying with relaxation. You must associate books with relaxation and not with anxiety. When you study . . . STUDY. When you worry . . . WORRY (but not in your study place). However, don't try to do both at the same time.

One final word about Rule #8. Do not try to relax so much that you begin to feel drowsy and sleepy . . . that is defeating the purpose of the rule. You want to feel relaxed enough so that you don't escape from studying by daydreaming. At the same time, you should feel just a little tension so that you'll be awake and alert to do the kind of concentrated studying that is necessary.
STUDY BEHAVIOR

Checklist

Yes__ No__ 1. Did you anticipate and avoid temptations that occur before studying?

Yes__ No__ 2. Did you take only what you planned to study to your study area?

Yes__ No__ 3. Did you display your study symbol when studying?

Yes__ No__ 4. Did you keep a reminder pad handy when studying?

Yes__ No__ 5. Did you do only studying and nothing else in your regular study area and at your regular study time?

Yes__ No__ 6. Did you divide your study sessions into study intervals?

Yes__ No__ 7. Did you take short breaks after your study intervals?

Yes__ No__ 8. Did you study your hardest subject first?

Yes__ No__ 9. Did you study alone?

Yes__ No__ 10. Were you active when studying?

Yes__ No__ 11. When daydreaming started, did you turn away from books?

Yes__ No__ 12. Did you make an effort to relax before you started to study?
PART III
SELF-DIRECTED CONTINGENCY MANAGEMENT

Introduction

The first three units of this manual discussed how to use the principle of stimulus control to create effective study habits. Accordingly, you were given rules for setting up regular study places that are free from distractions and conducive for serious studying. You were also provided with rules for scheduling regular study times so as to make the most efficient use of your available time during the semester. Finally, you were offered rules as to what you should do and not do before and during each study session, in order to minimize distractions and temptations that interfere with concentrated studying. In other words, you were presented with a useful set of rules on how to arrange your environment and plan your life so that studying becomes an automatic, easy-to-do behavior.

In the following three sections, you are going to undertake a systematic program for the self-improvement of studying. Some of you may already be doing fine in your studying, while others of you may still be struggling. In either case, you'll probably want to improve upon your present level of performance. If you're performing at the "D" or "F" level, you'll certainly want to move up to the "C" level; if you're doing "C" work, you may want to begin doing "B" work; and if you're performing at the "B" level, you'll probably want to achieve grades of "A." If you're already doing "A" work, you may want to maintain that performance level with less study effort--that is, you may desire to study more efficiently. Read on to learn how to construct a well-designed program for improving your study behavior.
Introduction

This section of the manual will be most meaningful to you after you have completed several weeks recording of your study time. The topic, Shaping Study Improvement, refers to a system for gradually improving your study behavior over your present level. In order to do this, you must know exactly what your present level is. And to know what your present level is, you turn to the records you’ve kept thus far on your studying.

Planning for Improvement

Accurate self-knowledge is absolutely necessary for the self-improvement of studying. Your record of studying gives you this accurate self-knowledge: it tells you exactly how much you are now studying. But the idea of this study program is not just to obtain a measure of your studying, but to improve your studying. Making the initial recordings of your study time can be expected to bring about some improvement. But how much improvement? How can you go beyond that initial level?

The first several weeks record is called your baseline. It refers to your beginning point . . . the original level to which later levels can be compared. Comparing your study records from week to week will give you exact feedback on whether your self-improvement program is succeeding. So, it is vitally important to continue recording and to collect and compare each week's record with those of previous weeks.

Now, almost every student has a rather strong reaction to seeing his study records during the beginning weeks of the program. This reaction may be pleasure but it is more often discouragement. While you may be pleasantly surprised at how much you are studying, you are more likely to be dissatisfied to see how little time you actually spend on studying. In either case, you will probably want to increase your studying time. How do you go about planning for this improvement?

The wrong way. Unfortunately, the wrong way to go about planning for improvement is the one most often used by students. The typical student, upon seeing his study records, is likely to relate his performance to his ultimate goal and decide to start attaining this ultimate goal immediately. While such a reaction may sound reasonable, it often leads to failure. Consider this example: John Wise checks his baseline record and finds that he is studying on the average only two hours a week. He realizes that this is not enough to obtain good grades or to increase his learning. He estimates that he needs to study at least 15 hours a week. Accordingly, he
decides immediately to set up a weekly schedule that calls for 15 hours of study per week.

Such an approach in planning a self-improvement program contains two major errors. The first error is deciding on the final goal in advance. John's estimate of his ultimate goal can only be a wild guess. He may need only 10 hours of studying per week; more likely, however, he'll need 20 hours of concentrated studying. The final goal can only be determined by actual experience in studying. Therefore, the final goal should not be established in advance.

The second error is that John planned too large a step for improvement. He is probably biting off more than he can chew. Let's assume that John has really been trying to study during the early weeks of his recording. He is trying to use his regular study place and he is trying to study during his regular study times. He wants to improve, but there are many old habits that are interfering with his plans for self-improvement. In short, John is doing about as well as he can at this particular time.

We can predict the outcome of John's plan to increase his study time immediately and by a large amount...it will fail. John is likely to find that he is not really getting to his regular study place and that he is not actually studying during his regular study times. He checks his subsequent weeks record of studying and finds that he has not improved as much as he desires. He becomes disappointed and begins to forget the recording of his study times. He begins to avoid his regular study areas; he starts to do other things instead of studying during his scheduled study times. To John, his plan to study 15 hours seem like an impossible amount of studying...he hasn't improved, he's right back where he started, and consequently he decides to forget the whole thing. This failure is due to his planning on too large a first step for improvement.

The right way. In a correct plan for improved studying, John would have done things quite differently. In the first place, he would have avoided making a judgment about his final goal. He would have said to himself:

"I'm not sure how much I will need to study eventually, because this will be affected by how efficiently and effectively I actually do study. But I do know that I must improve and I must increase my study time by some amount."

How much of an increase in studying? The answer lies in the baseline record. The decision should be made by checking the baseline, not by looking at some ultimate goal. John should examine his baseline record and set his first step for improvement slightly above that level. For example, John's baseline record showed that he was studying two hours a week. His first step might consist of studying two-and-a-half hours during the subsequent week. This is wise planning, even if John believes that the first step will not be enough in the long run. It is wise because he can do it.
Rules Governing Use of Shaping

The discussion above is firmly grounded in experimental research on learning. This research suggests that in order to learn complicated skills, you must learn them a step at a time . . . each step building on what you can do, with progress to the next step dependent on the prior step being accomplished. This procedure is called "shaping" or "successive approximations," which means that the learning of a goal-behavior is achieved through a set of approximations to that goal . . . with each approximation begun only after the previous step is mastered.

Suppose, for example, that you want to learn how to bowl. The goal-behavior is of course bowling strikes. The procedure of "shaping" or "successive approximations" involves requiring yourself to improve only by steps that you can actually perform. Accordingly, the first step might be to learn how to hold and grip the bowling ball. The next approximation might be to take four steps down the alley and release the ball. You'll probably roll the ball into the gutter many times, but it doesn't matter. You're learning the necessary skills one step at a time, and you'll always get another chance. The third step might be to try to hit the head pin with the ball. This may take a great deal of practice, but after it's accomplished you're ready to aim for the 1-3 strike pocket. So, through a series of small approximations (steps) toward the final goal-behavior (bowling strikes), you can successfully progress toward achieving a goal that was previously beyond your skill level.

In using this shaping procedure, there are four rules you should follow. Let's review briefly each of them.

Rule #1: Design sufficiently small steps in the shaping program such that successful progress is assured

The first and most basic rule is that each step should always be small enough to guarantee success. You should ask yourself to improve only by steps that you can actually perform without difficulty. This is extremely important, because almost every student who tries to use this shaping procedure makes one fundamental error: the shaping steps are not small enough. It is much more important that each step actually be completed, then it is for you to rush immediately toward some future goal which you cannot now perform.

In following this rule, if you're uncertain as to whether a step is too small or too large . . . always err on the side of steps that are too small. Thus, if you select a shaping step that seems ridiculously easy to you, then it is probably in the right range . . . precisely because it appears easy, you'll do it and succeed. There is another reason for choosing too-small steps. If your shaping steps are too large, you will increase the chances of failure. If you fail to complete the steps, you may become discouraged. And if you become discouraged, you may destroy any progress made as well as give up the entire self-improvement plan. Now, some students claim that they can't afford to take only small steps, because there isn't sufficient time to reach the study level which they wish
to attain. However, it should be pointed out, as yet another reason for taking small shaping steps, that you can always add another step as soon as you have accomplished the previous step. Your records of studying will tell you if you are succeeding and when you are succeeding, you can add another step and continue to progress until you are performing at the level that you desire.

Rule #2: Select the first shaping step on the basis of your baseline performance

The second rule deals with selecting the first step in your self-improvement plan. This rule states that you should determine the first step in your shaping plan by looking at your baseline record . . . by taking note of what you have actually been doing. Thus, the first step should be only slightly above or slightly better than what you have actually been doing. You should never start at a level that you perhaps can achieve, but in fact almost never actually do.

For example, on the night before an exam, you can probably study hours on end in cramming for the test. So, when you're pressured, you can engage in several hours of concentrated study at a time. But to set that level as your first shaping step is a serious mistake . . . it is a mistake because you're likely to give it up very soon. The baseline information on your studying behavior provides you with a record of your typical performance under typical conditions . . . conditions under which you actually do your studying. Thus, the baseline record should be used to determine the first step in your self-improvement plan.

Rule #3: Arrange each successive shaping step so that it is only slightly more difficult than the previous one

The third rule on the use of the shaping procedure deals with the selection of steps following the first one. This rule states that you should determine these subsequent steps in the following way: check your past performance and make the next step only slightly more difficult than the previous step. This means that you must have an ongoing record of your studying so that you'll know your most current level of studying performance. More importantly, the rule also requires that you must have achieved success with the prior step before adding another step. Thus, be sure that you have mastered one step before moving on to another. After all, the whole point of the shaping procedure is doing only as much as you can and adding more only as you can handle it.

Rule #4: Your program for shaping should be completely individualized

The fourth rule states that the shaping procedure is an individualized process. That is, your choice of shaping steps should be made on an individual basis, by checking your baseline record and your past and current performance. The series of steps that you undertake in your self-improvement program are going to be different from those of any other student. No two students are exactly alike in terms of their study
behaviors, study times, and study places . . . and thus, no two students will have the same shaping steps in their self-improvement plans. This means that you cannot rely upon some other student's program of shaping steps in designing your own plan. Moreover, you must have an ongoing record of your own studying in order to make intelligent decisions regarding your shaping steps.

**Example of a Correct Shaping Program**

It is difficult to give relevant examples of the correct use of the shaping procedure, due to the fact that shaping is a completely individualized effort. However, since students often commit errors in selecting their shaping steps, it may be useful to present an illustration of the step-by-step process of a good shaping program.

**Introduction.** The following is the shaping program for a student who is having difficulty in concentrating on his studying. John Wise finds that even when he is in his regular study place, his studying is inefficient, with the time actually spent in studying virtually zero. John's plan for self-improvement shows the tiny steps that make up a wise shaping program. First, John picks his most difficult subject (math). His self-improvement program calls for him to study math and only math in his regular study place. He is not to study anything else there at this time. When he studies math, he undertakes the following shaping steps:

**First study session.** When John loses his concentration, he immediately leaves the study area. He leaves as soon as he begins to daydream or begins to feel anxious. He just picks up his materials and leaves. He stops studying immediately, and goes to do whatever he wants to do.

At this point, John has established his baseline—the record of what he is doing and the point from which he'll begin the shaping procedure. The plan is to gradually increase the amount of time he spends studying, the number of pages he reads, or the number of problems he solves. It doesn't matter if he's studied only five minutes, or read only half a page, or solved only one small problem. The important thing is that he now knows what his baseline performance is and thus, at what point he needs to start his self-improvement program.

**Second study session.** In this session, John follows the same procedure of leaving when he begins to daydream or begins to feel anxious, but with one addition: when he decides to leave, he reads one more page carefully or solves one more problem (the easiest one). After doing this, he leaves the study area immediately. Under no condition does he remain to study, even though he may become interested again in the work.

**Third study session.** In this third session, John again follows the same procedure. But this time, when he has made the decision to leave, he must read two more pages carefully or he must solve two more problems. After he does this, he must leave the study area immediately and do something he enjoys such as watching TV, or talking to a friend.
Fourth study session. In this session, when John begins to daydream or feel anxious, he must make a decision to leave. And when he does make the decision to quit, he must read three more pages or solve three more problems before leaving. After he does this, he absolutely must leave.

Fifth study session. In this fifth session, when John decides to call it quits, he must read four more pages or solve four more problems before leaving. This now means that even if John wants to leave as soon as he arrives at his study place, he will read at least four pages or solve at least four problems before leaving.

Comment. These five study sessions need not take place on one day; they could be spread over two, three, four, or five days. However, the point of these first five sessions is that John has now divided his studying into 4-page work units, or into 4-problem work units. In effect, John has set a minimum rule for himself: each time he goes to study math in his regular study place, he will read at least four pages or solve at least four problems before he quits and leaves.

There are three additional points to note about the program so far. First, notice that John gradually built up to the minimum rule over the five sessions . . . this is shaping. Second, note that when John made the decision to leave, he completed extra work and then left immediately . . . even though he became interested again in the work. Third, the additional steps (one more page to read or one more problem to solve) could be handled with ease by John. This may not be true in your own case; you'll have to adjust the procedure to fit your own circumstances so as to be sure that the shaping steps are easy for you.

Subsequent study sessions. Now that the minimum rule is set, it means that John will always read at least four pages or solve at least four problems. At the end of that work unit (reading four pages or solving four problems), John makes a conscious decision as to whether to leave or to continue studying. If he decides to quit at that time, he must leave the study area immediately. If he decides to continue studying, he must complete another work unit (reading four more pages or solving four more problems). Upon completing another work unit, he makes another decision as to whether to leave or remain. John continues to study in this way up to a maximum of one hour, at which point he stops studying and takes a break.

Comment. Notice five important things about these later study sessions. First, John makes a conscious, explicit decision as to whether he will stop or continue working. Second, whatever his decision, John will always complete at least one work unit for each study session. He will always follow the minimum rule of reading at least four pages or solving at least four problems. Third, if John decides to continue studying, he must complete another work unit. After doing this, he again comes to a decision point: whether to continue or stop. Fourth, if John decides to stop studying, he must immediately quit working and leave the study area. Finally, if John does decide to continue working, he must eventually stop after studying for one hour. On full hour of concentrated studying is the maximum that he should work at any one sitting, at which time in order to avoid
fatigue and restlessness, he should take a break from studying.

Adding other courses. After John is able to study math (his most difficult subject) for an hour at a time, he then applies the same shaping plan to his next most difficult course. Notice that he waits until he is doing effective and efficient studying in his most difficult course before he applies the same shaping program to his other courses. During this time, he just tries to do his best with these other courses. Only after he has succeeded with the math course does he begin to use the shaping procedure with other courses.

When he does apply the shaping plan to his other course, John finds that it is easier to do, since the other courses are not as difficult as math and since he has been practicing the necessary steps in the shaping procedure. He follows the same shaping steps for each of his other courses. He also takes on only one course at a time . . . adding a new course only after he has successfully completed the shaping procedure on a previous course.

Increasing study time. Notice that if you follow the above system of shaping, you'll end up dividing your study time into distinct work units, and eventually dividing your day into one-hour study sessions for your various courses. This suggests two ways to gradually increase the amount of time you study.

Suppose you have shaped your studying so that once per week you're spending one full hour on your hardest course. If you find that it's not enough, you could begin to add a second hour on that subject for the week. Or suppose you've shaped your studying so that you're completing two work units each day for five days of the week. If you find that this isn't enough to keep up with the course, you could start adding another work unit for each day, making three work units per day.

In increasing your study time, however, keep in mind that you should not go too fast . . . otherwise, you'll fail to make the necessary progress. In other words, remember to follow the four rules given earlier on the proper use of shaping. In particular, note the fourth rule about individualization. The previous example is offered as merely that . . . as an example. Do not hesitate to change the procedure or the steps to fit your own situation, particularly your baseline record. Upon checking your baseline, you may choose to begin to use shaping steps just to get yourself to your study place. Whatever your current situation, it is likely that you want to improve on it . . . and if you do, you should start a self-improvement program by correctly applying the shaping procedure to your studying.
SHAPING STUDY IMPROVEMENT

Checklist

Yes  No  1. Did you translate your study goals in terms of a series of successive approximations (i.e., shaping steps) toward those goals?

Yes  No  2. Did you incorporate a series of shaping steps into your study self-improvement program?

Yes  No  3. Did you design sufficiently small steps in your shaping program such that successful progress is assured?

Yes  No  4. Did you select the first shaping step on the basis of your baseline performance?

Yes  No  5. Did you arrange each successive shaping step so that it is only slightly more difficult than the previous one?

Yes  No  6. Did you draw up your program for shaping so that it is completely individualized?
UNIT 2

SELF-CONTRACTING FOR STUDY

Introduction

Once you've designed a plan of individualized shaping steps, you're ready to undertake fully a program for the self-improvement of your studying. Already you have set up the conditions in which you can study most effectively. You have chosen the best place to do regular studying without distractions. You have chosen the best times to do consistent studying without interruptions. You are behaving--before and during your study sessions--in ways that allow you to avoid temptations and distractions, and to engage in concentrated studying. You have collected careful records which provide you with feedback about your actual study behavior. You have established a series of shaping goals--arranged one step at a time--which are only slightly above your baseline level of performance.

These are the characteristics of a careful and intelligent plan for studying. If you've completed these stages, you can be content ... your program for studying could hardly be improved. But now comes the crucial question: will you actually stick to the plan?

The answer is yes ... provided you have a clear set of rules for carrying out the plan. There are five major reasons why explicit rules make studying more likely. First, setting a rule for yourself means establishing an expectation about your own behavior. If you expect to be studying at a certain time and at a certain place, the expectation itself makes it more likely that you will do so. Second, setting rules is a way of creating personal standards for your own behavior. These standards can then be used to judge your behavior; since the standards are your own personal ones, and thus more meaningful, you're more likely to meet those standards. Third, clear rules provide a means of allowing you to judge errors and failures. If you are not studying in the way called for by the rule, your behavior is in error. If you do not have explicit rules and are relying on a vague promise to "study better," you can never tell whether you are doing so or not. Self-correction becomes impossible because you never know on a moment-to-moment basis if you need correction. Fourth, clear rules provide a way of allowing you to feel free from guilt. One reason studying is painful is that it hangs over your head all of the time ... no matter where you are, there's usually a vague feeling that you "should" be studying. Explicit rules effectively eliminate this problem, because they tell you when you should not be studying. In other words, if your rules call for studying at certain hours, then all other hours are legitimately free from studying. In this way, explicit rules can bring great relief during non-studying hours since you will have earned the freedom from work. Finally, clear rules produce a sense of commitment on the part
of the individual. A good set of rules is one which is clearly written and formally signed by the individual. This tends to bring a sense of formal commitment to the fulfillment of the rules . . . since a good set of rules becomes, in effect, a self-contract.

Procedures for Self-Contracting

Drawing Up a Self-Contract

A self-contract consists of a set of explicit rules containing three elements (when, where, what).

When. You should specify exactly when you will study. The beginning time for each study session should be defined precisely; for example, Mondays at 8:30 a.m., Fridays at 2:00 p.m., etc. The ending time for each session should also be defined exactly; for example, Mondays at 9:45 a.m., Fridays at 3:30 p.m., etc. Your contract may also include instructions on what you will do if you begin to daydream or feel anxious during your study session. For example, you might include in your self-contract instructions that you will read one more page or solve one more problem before stopping, as discussed in the last unit.

Where. You should state exactly where you will study. These places should be only those which you have selected as your regular study areas. If some parts of your daily time plan make it impossible for you to get to your study area, you may include minor adjustments that call for studying in other places. However, don't let this happen too often, as an ideal contract calls for all studying to be done at the regular study area. Whatever the case, it is important that the contract state exactly where you are to study each time that you do study.

What. You should state exactly what you will be doing during your study session. You should specify which course you will be studying in each of your study sessions. You should also indicate the type of activity you'll be engaging in--that is, writing a term paper, preparing a speech, revising lecture notes, reading a textbook chapter, reviewing for an exam, etc. Finally, you should state precisely the study intervals you plan to use for each session and the kinds of breaks you plan to take.

Recording and Shaping as Part of the Self-Contract

How should you decide on the "when," "where," and "what" of self-contracting? . . . by checking the recordings of your own study behavior and by using the shaping procedure. The self-contract should not be some idealized plan which you are far from achieving. The contract should call for a series of goals that are within your reach. Thus, you should design your contract (i.e., you should set up your explicit rules for studying) on the basis of your observations of your past and current studying, as well as on the basis of the proper use of shaping steps. Accordingly, you should draw up a series of contracts from one week to the next, with the exact content of each contract changing from week to week.
Writing and Signing the Contract

Each of the three elements (when, where, what) comprising the self-contract should be clearly written down on a sheet of paper. Use one of the Study Self-Contract forms that come with this unit. Keep the written contract with you at all times in your notebook or folder.

While signing the self-contract may seem a bit unnecessary, it can make a powerful difference. The form of the contract should be in legal terms. Moreover, you should sign it with all the seriousness that you would sign a legal contract with someone else.

In summary, the first step in determining the "when," "where," and "what" of self-contracting is to examine your baseline record. The information on your baseline level of performance tells you what you are actually doing in terms of your study behavior. The second step is to decide on an initial shaping goal which you are certain of achieving, and which is only slightly more difficult than what you've been doing during your baseline period. The third step is to actually write the contract . . . and then to sign it.

Examples of Self-Contracts

Simple self-contract. The following self-contract would be appropriate for students who find that their baseline performance is very low:

"I, Noah Johnson, hereby agree to study only at or near the fifth desk at the makai side of the Iolani Library between 9:00 and 9:30 a.m. on Mondays, Wednesdays, and Fridays; I shall spend this time reading the textbook for my history course.

Signed: _____________________________"

In designing this contract, Noah notes that his baseline record indicated that he was reading his history textbook for less than 20 minutes on each of the three days. As a result, he was falling behind in his required reading assignment and doing less than he needed to pass the course. He wisely uses a small first shaping step . . . from 20 minutes of studying during his baseline to 30 minutes as the first step in his shaping program. The resulting self-contract is clear, precise, and practical . . . and can be revised upward the following week.

Complex self-contract. Other students may find that their baselines suggest a more complicated plan. Whatever your current level of studying, a contract should be developed that calls for a sequence of shaping steps.

"I, Bradford Ramos, hereby agree to increase my studying and improve my study habits. I need two study areas--one for math and one for my other courses. I will study math at the Iolani Library, and all other courses in my room at home."
Math. I will study math (solving problems) for a minimum of 20 minutes and a maximum of 60 minutes each day, starting at 1:00 p.m. At the end of the 20 minutes, I can choose to leave or remain for another 10-minute period. If I decide to leave, I must solve one more problem before leaving. I can continue in this way up to one hour, but no longer. At the end of each day's session (regardless whether it lasts 20 minutes or 60 minutes), the rest of the day is joyously declared to be free from math!

Other courses. My current baseline for these courses averages 90 minutes a day. I will increase my study time to 120 minutes, using 10-minute shaping steps. I will read the required textbooks for these courses, and take notes. I will study from Monday through Friday, 7:30 to 9:30 p.m. in my room at home.

Signed: ________________________

Bradford's contract is constructed wisely. Notice that it is completely explicit as to when, where, and what he will study. Dividing his contract into two sections—one dealing with his most difficult course, math, and the other dealing with the rest of his courses—is wise because it allows him to use separate plans for each. His shaping procedure for math is similar to the one offered in the example in the unit on shaping, but it is adapted to his individual situation. Also notice that he gains freedom from math (i.e., freedom from feelings of guilt) by fulfilling his daily contract requirement. Bradford's contract, which is based on accurate self-knowledge gained from the recording of his study behavior, appears likely to lead to success.

Revising the Self-Contract

Whatever your baseline level, the basic strategy is essentially the same: check your baseline record, use gradually increasing shaping steps, and individually design your contract so that steady improvement occurs. In following this strategy, most students should expect to revise their contracts every week. If sound contracting is used, over the weeks you will make successive approximations to your ultimate goal, which is concentrated studying in sufficient quantity. As your study output increases, so will your expectations for further studying. Each week's contract will tend to encourage you onward and upward . . . to a level just above that which you have already achieved.

For these reasons, continuous record-keeping is extremely important throughout your entire program of self-improvement. The self-contract does not replace record-keeping. Keeping accurate records of your studying will tell you how well you are meeting the terms of your contract. As you compare what you actually did with what your contract called for, you can judge what changes are needed in the contract.
For a moment, let's suppose the worst. Suppose Noah Johnson or Bradford Ramos keep accurate records and find that they did not actually meet their contract requirements. They might be disappointed . . . but they should not conclude that they have no willpower, are hopelessly bad students, or resign themselves to poor grades. Instead, they should recognize that they wrote up a bad contract in the first place: the contract was too demanding, too far above their current level of performance.

Under these circumstances, the appropriate thing to do is to revise the contract downward. Noah might reduce his study time to 20 minutes. Bradford might reduce his minimum math study time to 15 minutes. These decisions to revise the contracts are based on Noah's and Bradford's actual performance as shown by the records of their studying behavior. In other words, they should set the subsequent week's contract only slightly above the previous week's level of performance. In this way, they can correct the error in the original contracts of demanding too large a first step.
SELF-CONTRACTING FOR STUDY

Checklist

Yes No 1. Did you draw up a self-contract for your studying?

Yes No 2. Did you design your self-contract on the basis of your study records of your past and current studying?

Yes No 3. Does your self-contract specify exactly when you are to study?

Yes No 4. Does your self-contract specify exactly where you are to study?

Yes No 5. Does your self-contract specify exactly what you are to study?

Yes No 6. Does your study self-contract include a program consisting of a series of individualized shaping steps?

Yes No 7. Did you examine your baseline level of studying in determining the initial shaping goals for your self-contract?

Yes No 8. Did you sign the self-contract?

Yes No 9. Did you post the self-contract in a conspicuous place for you to see?

Yes No 10. Did you revise your self-contract each week, so as to require a higher level of studying performance from yourself from one week to the next?
Now that you have read the section on Self-Contracting for Study, it is important that the new knowledge which you have gained be translated into actual practice. By undertaking the following action steps, you can begin to apply systematically the procedures for bringing your studying behavior under the control of the terms of the self-contract. After completing this worksheet, together with the attached Study Self-Contract, place them in the box in Mr. Yelas' secretary's office.

<table>
<thead>
<tr>
<th>Completion Dates</th>
<th>Action Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (Blank)</td>
<td>Using the Study Self-Contract form, draw up a self-contract for your studying. Make it as specific as you can, since setting <strong>specific rules</strong> (i.e., spelling out the specific terms of the contract) helps you in following the rules.</td>
</tr>
<tr>
<td>2. (Blank)</td>
<td>Spell out the <strong>precise times</strong> (i.e., when) during which you are scheduled to study throughout the week. For example, MWF 7:45-8:35, TTh 11:50-1:23, weekday evenings 7:00-9:30, etc. If your study times are already specified on your Weekly Time Plan, you may include it as a part of your contract.</td>
</tr>
<tr>
<td>3. (Blank)</td>
<td>Indicate the <strong>specific places</strong> (i.e., where) at which you plan to study in the course of the week. These are likely to be your regular study places. For example, your study desk at home, the library at school, study hall, etc.</td>
</tr>
<tr>
<td>4. (Blank)</td>
<td>Name the <strong>particular subjects</strong> (i.e., what) which you wish to study during the week. You may choose to include all your courses in your contract, or just certain courses such as the most difficult ones.</td>
</tr>
<tr>
<td>5. (Blank)</td>
<td>Outline the <strong>individualized shaping steps</strong> to be undertaken. Your contract should call for gradually increasing amounts of studying from one week to the next. For example, 120 minutes of average daily study time this week, with increases (i.e., shaping steps) of 20 minutes for each subsequent week.</td>
</tr>
<tr>
<td>6. (Blank)</td>
<td>Specify the <strong>available self-rewards</strong> to be employed. Arrange for powerful rewards to follow your studying, to be obtained for fulfilling the various terms of your contract. You need to specify what amount of contract work results in what amount of rewards. For example, &quot;120 minutes of average daily study time this week earns me four hours of tennis on the weekend.&quot;</td>
</tr>
</tbody>
</table>
7. Include any additional details. Make a note of any relevant additions to the conditions of your contract. For example, "My parents agree to give me a bonus reward of $5.00 for completing the week's contract in its entirety."

8. Sign the self-contract with all the sincerity with which you sign a legal document with someone else.

9. Post the self-contract in a conspicuous place to be seen. Indeed, you may choose to place your contract on public display, as a means of increasing the pressure to stick to it.

10. Revise and rewrite the self-contract every week, based on your success or failure with it during the previous week. In most cases, your contract is likely to remain the same from week to week, except for changes in weekly shaping steps and rewards.
UNIT 3

SELF-REWARDING OF STUDYING

Introduction

After you have established clear rules for carrying out your study plan, you need only one more thing to make your self-improvement program really complete. What you need is a way to make sure that you follow the rules of your plan. Up to this point, you have chosen the best place for your regular study area, you have selected the best times for your regular study time, and you have behaved in ways that reduce distractions and avoid temptations. You have thus established the conditions for effective stimulus control of studying. In addition, you have collected accurate records of your studying, you have arranged appropriate shaping steps based on these records, and you have set up explicit rules for carrying out the study plan. In short, you have designed an intelligent program for studying.

The only remaining thing to consider is whether you will continue to maintain the conditions for effective stimulus control of studying and to carry out your systematic plan for studying. We come now to the final necessary ingredient for your self-improvement program: a method of ensuring that you follow the rules of your study plan, while at the same time strengthening your study behavior.

Principle of Reward

There is a well-known principle in psychology called reinforcement. This principle states that any behavior which is followed by a reward is strengthened—that is, rewarded behavior is more likely to occur again. What this means simply is that if something good happens after you do something, you are more likely to do it again. On the other hand, if you do something and nothing good happens, then you will probably not do it again. This principle works for studying just as it does for other kinds of behavior. Studying, as behavior, will be strengthened if it is followed by rewarding events. Conversely, studying will be weakened if it is not followed by rewards.

What kinds of things might serve as rewards for studying such that studying is strengthened? In general, if you carry out a systematic study plan, you'll gain a number of positive results such as better grades, less worrying, more free time, and less cramming. In particular, following the rules of your study plan may bring you a sense of self-satisfaction. That is, as you see yourself gradually improving, you may begin to feel more in control of your studying and thus more satisfied with it and with yourself. In addition, carrying out your study plan may lead you to anticipate future
positive consequences. That is, as you improve in your studying, you may begin anticipating the time when you will receive higher exam scores, feel less hassled, or experience more self-respect. All of these things are rewards, and may be sufficient to strengthen studying for some students.

For many students, however, these rewards are not enough . . . especially in the beginning stages of their study plan. Most of these rewards are too far in the future to exert a strong influence on your behavior now. The effects of these rewards are likely to be slow in showing up. It may take weeks before your grades improve, since it'll take weeks to get your study plan working properly. In addition, for most of you, an intelligent study plan is one with gradually increasing steps of shaping. It may thus be several weeks before your studying is at a level at which your grades show improvement.

What's worse, your progress may become stalled. You may never even begin the first shaping step. You may quit keeping records. Perhaps, you may find more and more excuses for not following your self-contract. Finally, you may begin to hate this entire notion of study improvement . . . including this manual. If these things happen, they mean that you are not being rewarded enough for studying and for doing the things necessary for effective studying to take place.

Therefore, you all need to apply the principle of reward to the behavior of studying. You can use this principle both to increase the amount of studying you do and to improve the kind of studying you do. By applying the reward principle, all that you've learned about effective studying can be put into actual practice in your daily life. How to do this? . . . read on.

Rules Governing Use of Self-Rewards

There are six major rules to bear in mind in applying the reward principle to studying. Each of them must be followed exactly if the principle is to influence your study behavior.

Rule #1: The reward must follow the behavior

This is the most basic rule. The rule states that the reward must occur after, and not before, the behavior. For example, suppose you had planned a study session for 3:00 on Monday afternoon. As you're going to your study area, your classmate invites you to join a card game. So you decide to play a little now and then do your studying. In this instance, the reward (card-playing) is taking place before the behavior (studying) . . . and this is clearly the wrong way to do it. It's very tempting to reward yourself before studying . . . so, be aware of what you're doing and be careful to reward yourself only after studying takes place. Remember to get the order correct: first you study, then you get the reward.
Rule #2: The reward must be something you like or some activity you enjoy

There are two things to note about this rule. First, a reward may be not only a thing, but also an activity, such as surfing, listening to music, shopping, and watching TV. Second, it is important to note that a reward is defined by you. A reward is a reward only if you feel good about it, if you want it, or if you would enjoy it. This means that what is a reward for one person may not be a reward for another person. Thus, in selecting things or activities for rewards, do not look at what your friend is choosing. ... you'll find what is rewarding for you by looking at yourself. If you feel good, pleasant, or positive about a thing or activity, then it is a reward for you.

Rule #3: The reward must follow immediately after the behavior

This rule states that the reward must come immediately after the behavior. As soon as the behavior occurs, the reward should follow. In this way, the reward has a stronger effect on the behavior. If a reward occurs a long time after studying, such a reward will have little influence on your study behavior. Sometimes, it may be difficult or impossible to follow the rule exactly. For example, if you've selected the weekend football game on Friday night as your reward for studying you'll find it impossible to reward yourself for studying one hour on Tuesday. Nevertheless, there's a way to handle a situation like this: use token rewards to bridge the gap between Tuesday and Friday. More about this later.

Rule #4: The reward must be available only under the conditions of your self-contract

This rule assumes that you have a self-contract which specifies exactly what you have to do in order to get the reward. The rule requires that you can obtain the reward only by doing what your contract says you must do. This rule is extremely important. If you are able to get the reward any time you choose, you obviously don't have to do what the contract says. As a result, you will have defeated the whole purpose of setting up an effective study plan. When you use rewards, you must agree to obtain them by meeting the terms of your self-contract ... and only in this way. In other words, you get the reward only if you "deserve" it ... that is, only if you do what your self-contract says.

Rule #5: The reward should be made easy to obtain

After reading the first four rules, some of you may be saying: "I can't do it; you're asking me for more willpower then I have!" The way to ensure that you will follow the rules is to set up shaping steps that are so easy that you are likely to do the studying and thus get the reward. Arrange your shaping steps so that at first, you require yourself to do very, very little in order to obtain the reward. Then you increase the requirement by a step which is still small and easy enough for you to accomplish successfully. You continue to increase the requirement in small steps, so that each time you're able to meet the requirement and get the
reward. In other words, Rule #5 states that you should make your shaping steps so easy to do in order to get the reward that you'll feel foolish if you fail to do them.

Rule #6: The reward may be any activity that you usually engage in instead of studying

You can use as rewards any activities which you would prefer doing rather than studying. That is, whenever you have a planned study session, there is surely some other activity you would rather be doing instead (such as having coffee with a friend, daydreaming under the shade of a tree, or "talking story" with a friend). These alternate activities are usually more rewarding than studying and therefore can be used to reward studying. In other words, any activity which you usually do instead of studying can be used as a reward for studying.

Types of Self-Reward

In the last section, we mentioned three kinds of rewards: things, activities, and tokens. Let's examine each more closely.

Thing-Rewards

These are material rewards that you would like to have, such as a new shirt, a mod hairstyle, a puka-shell necklace, or a pair of leather sandals. If these things are to serve as rewards for you, they must be what you personally want, not what someone else wants for you. The following contractual statement serves as an illustration of the inclusion of a thing-reward in the terms of the self-contract:

"If I study all week in accordance with the terms of my self-contract, then at the end of the week I can buy the record album I've wanted for so long. If I do not meet the conditions of my contract, then I absolutely cannot get the record album."

Notice that the contractual statement calls for getting the thing-reward only if and only after the studying specified in the contract has been done. Also notice that the reward can be gotten only under the conditions of the self-contract and that it cannot be obtained outside of the contract. This is an excellent example of the proper use of the reward principle.

Activity-Rewards

These are rewards that you would enjoy doing, such as playing tennis, reading a mystery novel, going to a movie, going to a fancy restaurant for dinner, calling a friend on the phone, and taking a nap. For example, you could include activity-rewards in your self-contract in the following way:

"If I study according to the terms of my self-contract all week, then at the end of the week I can shoot pool or watch
TV Friday night as much as I want to. If I do not study in the way stated in my contract, I can watch TV for a total of only one hour all weekend and not shoot pool at all."

**Token-Rewards**

In the previous examples of the use of thing-rewards and activity-rewards as part of the self-contract, the reward is available only at the end of the week. While this violates Rule #3, the terms of the contract may bridge the time gap between studying during the week and the reward at the end of the week. This is done through the use of tokens. Tokens are symbolic rewards that stand in the place of real rewards. The best known example of a token-reward is money . . . it is the things that money can buy (i.e., the real rewards) that make money so attractive. Accordingly, you can use money itself or some other token (such as a point system) as a self-reward.

Here's an example of a token point system. Jim wants to get himself to study history at least 20 minutes each weekday at his regular study place. Since he likes to go surfing but can do so only on Saturdays, he makes the following agreement with himself:

"For every 20 minutes that I study history in my regular study place, I get one point. In order to surf one hour on Saturday, I must have five points. When I have studied history for 20 minutes for five days, I will have earned 5 points. Then and only then can I spend one hour surfing on Saturday."

Note that the tokens--i.e., the points--help Jim to bridge the gap between the time he actually engages in studying and the time he gets the reward. Each day he studies history for 20 minutes, he checks off "one point" and that makes him feel good . . . he feels positive because he can see himself making progress toward his weekend surfing.

After the plan has worked for a week, Jim may decide that he wants to increase the amount of time that he studies history. He writes a new contract: "Surfing on Saturday still requires 5 points. Now, however, I must study 30 minutes of history in order to earn one point." The point system thus makes it easy for you to increase your studying on a gradual basis . . . according to the rules governing shaping steps. You can gradually require yourself to study more in order to obtain the same number of points necessary to "buy" the reward.

At a later date, Jim has succeeded in increasing his studying of history up to one hour per day. Now he wants to start increasing his study of speech, but he wants to be sure that he doesn't forget about history. Here is his new plan: "One hour of studying history now earns me one point. Surfing for one hour on Saturday now costs me 10 points. I can earn one point for each 20 minutes of studying speech." Note two changes in the plan: (1) the point-value for studying history is now lower than before; Jim has to study for one full hour just to earn one point, but this is okay because studying history already has become a strong habit; and (2) the
reward of surfing has gone up in price; it now costs 10 points to surf one hour (inflation has hit Jim's economy too), but this is also okay because Jim is far enough along in his self-improvement program to handle it. Thus, his new self-contract calls for rewarding two different behaviors—studying history and studying speech—with the same activity (surfing).

In short, Jim has designed and employed a systematic point system for the self-rewarding of his study behavior. He earned points for studying and rewarded himself with these points immediately after studying. Later, he "spent" the points to "buy" time to engage in his favorite activity, surfing. In this way, the points served as symbolic rewards that bridged the gap between studying at one time and being rewarded at a later time.

Self-Rewarding Studying Behaviors

As discussed in the previous section, you can design a self-contract that specifies studying for an entire week and provides for rewards upon fulfillment of the contract terms. You can plan on a big end-of-the-week self-reward which you earn by doing what your week's self-contract specifies. In setting up this self-reward system, you can also employ a token-reward system. In doing so, you should take the following steps: (1) write a clear and precise self-contract by checking your baseline record and using the shaping procedure; (2) make a complete list of things and activities that can be used as self-rewards, and decide whether you're going to use money or points as your token-rewards; (3) set up the token-reward system by applying the rules on the use of self-rewards; (4) set up a systematic plan for recording the number of tokens you earn and the number of tokens you spend; (5) continue to observe the self-contract's effect on your studying; and (6) if necessary, revise the self-contract and token-reward system.

The last two steps are important: you must continue to observe and record your studying so that you can evaluate the success of your contract-reward system. If you are failing to meet the terms of the contract, you may need to revise the contract downward. If you are succeeding in meeting the terms of the contract, you must revise the contract upward. Some students, if they succeed, are reluctant to change the contract and mess with success. But they miss the point: the entire purpose of self-contracting and self-rewarding is for the self-improvement of study behavior. And self-improvement means change and revision. You must continuously ask yourself to do just a little more than you have done previously. In this way, you will build upon success and move forward in your self-improvement program.

We have discussed the application of self-rewards as a means of strengthening studying for an entire week. It is important, however, to remember that rewards can be used to strengthen almost any behavior. In particular, self-rewards can be used to strengthen nearly every activity involved in studying. Thus, self-rewards can be used to reward short periods of studying (study intervals), long periods of studying (study sessions), or any other study-related activity.
Self-Rewarding Self-Improvement Behaviors

In addition, rewards can be used to strengthen the various behaviors involved in self-improving your studying. That is, you can use self-rewards to encourage yourself to keep records of your studying, to follow the four rules on the use of the shaping procedure, to write up self-contracts each week, to make up a list of possible self-rewards, to develop a token-reward system, to keep records of tokens earned and spent, etc. Here are some examples of self-contracts that call for the self-rewarding of behaviors involved in the self-improvement of studying:

"If I keep an accurate record of my studying all week, I can earn 5 token-points toward my end-of-the-week self-reward."

"I cannot buy another record album until I write my self-contract for next week."

"In writing my next self-contract, if I ask myself to do more studying than last week, I can have one hour of free time to do whatever I want."

"If I come up with a complete list of possible self-rewards, I can make an additional phone call to my girlfriend."

"If I develop a token-reward system by following the steps given in this manual, I can have one extra hour of watching TV."

"If I keep strict records of tokens earned and spent, I can get a special bonus of $1.00 worth of tokens."

The point of these examples is that a reward will strengthen virtually any behavior . . . it will reward not only studying itself, but also activities involved in setting up and running a self-improvement program for studying. Thus, if you find that you're not doing certain things in your self-improvement program, you can use self-rewards to get yourself to begin and continue to do these necessary things.
SELF-REWARDING OF STUDYING

Checklist

Yes___ No____ 1. Have you drawn up a list of possible rewards--thing-rewards, activity-rewards, or token-rewards--which you can use to strengthen your studying behavior?

Yes___ No____ 2. Have you selected the specific rewards which are to be included in your self-improvement program?

Yes___ No____ 3. Have you arranged for the rewards to occur after, and not before, studying?

Yes___ No____ 4. Are the rewards things which you like or activities which you enjoy?

Yes___ No____ 5. Have you arranged for the rewards to follow immediately after studying?

Yes___ No____ 6. Are the rewards available only under the conditions of your study self-contract?

Yes___ No____ 7. Have you chosen sufficiently small shaping steps such that the rewards for meeting the requirements of your self-contract are relatively easy to obtain?

Yes___ No____ 8. Are the rewards activities which you usually engage in instead of studying?

Yes___ No____ 9. Have you designed a study self-contract which provides for rewards upon fulfillment of the contract terms?

Yes___ No____ 10. Have you employed rewards to strengthen the various activities involved in setting up and maintaining a self-improvement program for studying?
SELF-REWARDING OF STUDYING

Worksheet

The purpose of this worksheet is to help you to implement some of the suggestions outlined in the unit on Self-Rewarding of Studying. By following the steps below, you can strengthen your studying behavior and make studying more likely to occur. Using the space provided at the bottom of the page, complete this worksheet and return it to the box in Mr. Yelas' secretary's office.

Completion Action Steps

Dates 1. Draw up a list of available thing-rewards which could be employed to strengthen your studying.

2. Looking over the list of available thing-rewards, select the three things which are most reinforcing for you (i.e., turn you on the most). Rank order them according to the following scheme: 1 = most reinforcing, 2 = second most reinforcing, and 3 = third most reinforcing.

3. Make a list of available activity-rewards which you could use to strengthen your studying behavior.

4. Glancing through the available activity-rewards listed, choose the three activities which are most rewarding for you (i.e., give you the most fun). Then rank order them, with 1 = most rewarding, 2 = second most rewarding, and 3 = next most rewarding.

5. Permit yourself these top-ranked rewards if you study in accordance with the conditions of your self-contract; likewise, deny yourself these rewards if you do not study according to the contract terms.

6. Set up a system of token-rewards (in the form of points or poker chips to bridge the time gap between studying and gaining access to the reward).

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Available Thing-Rewards</td>
<td>Selection of Top-Ranked Thing-Rewards</td>
<td>List of Available Activity-Rewards</td>
<td>Selection of Top-Ranked Activity-Rewards</td>
</tr>
</tbody>
</table>
STUDY SELF-CONTRACT

Week of ______________________

I, ______________________, hereby agree to the following terms of my Study Self-Contract:

Details on When to Study:

Details on Where to Study:

Details on What to Study:

Details on Shaping Steps for Studying:

Details on Self-Rewards for Studying:

Additional Details:

Signed: ______________________

Date: ______________________

Addendum:

My Weekly Time Plan for week of ________ is hereby made a part of this contract.
REFERENCES


Fox, L. Effecting the use of efficient study habits. *Journal of Mathetics,* 1962, 1, 75-86.


Gewirtz, J. L. The roles of covert responding and extrinsic reinforcement in "self-" and "vicarious-reinforcement" phenomena and in "observational learning" and imitation. In R. Glaser (Ed.),


McReynolds, W. T., & Church, A. Self-control, study skills development, and counseling approaches to the improvement of study behavior. Behaviour Research and Therapy, 1973, 11, 233-236.


