

THE EFFECTS OF SELF-MONITORING ON THE FREQUENCY
OF ASPECTS OF STUDY BEHAVIOR

by
Martha Peyton Kazlo

Dissertation submitted to the Faculty of the Graduate School
of the University of Maryland in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
1975

APPROVAL SHEET

Title of Thesis: The Effects of Self-Monitoring on the Frequency of
Aspects of Study Behavior

Name of Candidate: Martha Peyton Kazlo
Doctor of Philosophy, 1975

Thesis and Abstract Approved:

George L. Marx

Dr. George L. Marx
Professor

Department of Counseling and Personnel
Services

Date Approved:

July 30, 1975

ABSTRACT

Title of dissertation: The Effects of Self-Monitoring on the Frequency of Aspects of Study Behavior

Martha Peyton Kazlo, Doctor of Philosophy, 1975

Dissertation directed by: Dr. George L. Marx
Professor
Department of Counseling and
Personnel Services

Previous research has indicated that self-monitoring, observing and recording one's behavior, has proved effective in helping individuals modify some behaviors; however, other studies have shown no behavior change as a result of self-monitoring.

The present study was designed to investigate the effects of self-monitoring on writing answers to questions, one of the steps of the SQ4R method of study. The effects of self-monitoring were measured by observing study behavior. Less direct measures of study behavior, self-recorded behavior, self-report inventory scores, and examination scores, were examined to determine the relationship between observed study behavior and these measures which have been used in previous studies.

Forty-six undergraduate student volunteers were randomly assigned to either the treatment or to the control group. All students completed the items which comprise the SH score of the Survey of Study Habits and Attitudes, received information on the SQ4R method of study, watched a demonstration of the application of SQ4R, then demonstrated that they could apply the study method to a selection of reading materials. All students received copies of questions formulated by the experimenter on the content of a textbook that was required reading for an English course.

Students were instructed to read the chapter to answer the questions that were provided, recite the answers in their own words, then write the answers, using only key words. Students were instructed to answer a certain number of questions each week, and were told there would be an examination in four weeks. Information was not provided to the students that the answer sheets would be collected after four weeks, and that judges would rate the quality and quantity of their answers. Students who were assigned to the self-monitoring group received report forms on which they were instructed to record daily the number of questions to which they had written answers; the forms were collected each week. The control group received the same goals, questions, and instructions as the self-monitoring group, except they were not instructed to record the number of questions to which they had written answers.

The results indicated that the self-monitoring group wrote a significantly greater number of answers to questions than did the control group ($p < .05$). This corroborates previous reports which have shown that self-monitoring is an effective technique for producing behavior change. The findings were interpreted as suggesting that post-behavior self-monitoring is an effective technique for increasing the frequency of students' application of certain principles of effective study.

There was no significant difference between self-recorded behavior reports and judges' reports of study behavior. This was interpreted as suggesting that self-recorded study behavior is an adequate criterion measure of actual study behavior.

There was no significant difference between the examination scores of the two groups. This was interpreted as suggesting that changes in one aspect of study behavior, writing answers to questions on the material,

has little or no relevance to academic achievement.

There was no significant difference between the SH post-test scores of the two groups. This measure indicated no changes in study behavior; this is in contrast to the judges' reports and the self-recorded behavior record forms which did indicate change. This was interpreted as suggesting the least inferential approaches to collection of data on study behavior, judges' reports of behavior and self-recorded behavior, are preferable to the more inferential approach of using self-report inventory scores.

to
my parents

ACKNOWLEDGEMENTS

I appreciate the interest and patience of my advisor, Dr. George Marx; his assistance during the past years has been invaluable.

I thank Dr. C. Mitchell Dayton for his helpful ideas and suggestions concerning my research.

I am indebted to Drs. Mark Hardwick, Henry Walbesser, and Franklin Westbrook for their contributions and encouragement. I have truly enjoyed knowing and working with each of them.

I am grateful to Dr. Thomas Magoon who provided help in the planning stages, and who has added greatly to my development.

Special thanks to my friends, Kelley and David Evans, whose support has been immeasurable.

I wish to acknowledge The Psychological Corporation for granting permission to reproduce items from The Survey of Study Habits and Attitudes.

I wish to acknowledge the University of Maryland Computer Science Center for providing funds for computer usage.

TABLE OF CONTENTS

| Chapter | Page |
|--|------|
| DEDICATION | ii |
| ACKNOWLEDGEMENTS | iii |
| LIST OF TABLES | vi |
| LIST OF FIGURES | vii |
| I. INTRODUCTION AND STATEMENT OF THE PROBLEM | 1 |
| Effective Methods of Study | 2 |
| Self-management | 7 |
| Statement of the Problem | 9 |
| II. REVIEW OF RELATED LITERATURE | 10 |
| Self-reinforcement | 11 |
| Summary | 16 |
| Self-monitoring | 16 |
| Reliability of Self-reports | 22 |
| General Summary | 25 |
| III. RESEARCH METHODOLOGY | 28 |
| Subjects | 28 |
| Procedures | 28 |
| Experimental Conditions | 33 |
| Self-monitoring Group | 33 |
| Control Group | 33 |
| Dependent Variables | 33 |
| Ratings of Written Answers | 33 |
| Self-recorded Behavior | 34 |
| Written Examination | 34 |
| Survey of Study Habits and Attitudes | 34 |

| Chapter | Page |
|--|------|
| Hypotheses | 36 |
| Data Analysis | 37 |
| IV. RESULTS | 38 |
| Effects of Self-monitoring | 39 |
| Reliability of Self-recorded Behavior | 40 |
| Study Behavior and Other Criterion Measures | 41 |
| V. SUMMARY, CONCLUSIONS AND DISCUSSION | 44 |
| Summary | 44 |
| Effects of Self-monitoring | 45 |
| Reliability of Self-recorded Behavior | 47 |
| Study Behavior and Other Criterion Measures | 49 |
| Limitations | 52 |
| APPENDIX A. QUESTIONS ON TEXTBOOK MATERIAL | 54 |
| APPENDIX B. SCREENING SURVEY | 63 |
| APPENDIX C. SELF-RECORDED BEHAVIOR REPORT FORM | 64 |
| APPENDIX D. WRITTEN EXAMINATION | 66 |
| APPENDIX E. ANALYSIS OF VARIANCE SUMMARY TABLE COMPARISON OF JUDGES' REPORTS AND SELF-REPORTS | 68 |
| APPENDIX F. CORRELATION MATRIX | 69 |
| APPENDIX G. ANALYSIS OF VARIANCE SUMMARY TABLE FOR EXAMINATION SCORES | 70 |
| APPENDIX H. ANALYSIS OF COVARIANCE SUMMARY TABLE FOR STUDY HABITS POST-TEST SCORES | 71 |
| REFERENCES | 72 |

LIST OF TABLES

| Table | Page |
|---|------|
| 1. Summary Table: Means and Standard Deviations of Each Dependent Variable | 38 |
| 2. Analysis of Variance Summary Table for the Number of Answers | 39 |
| 3. Analysis of Variance Summary Table for the Number of Correct Answers | 40 |

LIST OF FIGURES

| Figure | Page |
|--|------|
| 1. Scatter Diagram: Self-report Cross-tabulated With Judges' Reports | 43 |

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

As early as 1953, over 90 per cent of the colleges in the United States reported offering some kind of a study skills program or assistance (Blake, 1955). Fox (1962) suggested that "poor study habits are a recurrent concern of educators despite the fact that the problem has been around a long time" (p. 76). Counselors in a university counseling service frequently encounter students who report difficulty in establishing effective study habits. Many of these students report that they "just cannot make themselves" begin to study. They avoid the task of study by involving themselves in other activities, or they begin studying, but then allow distractions to interrupt, so that further study does not occur. In both cases, the student is having difficulty increasing the frequency of study responses, i.e., reading a text, studying class notes, or solving coursework problems.

It is of little consequence if a student knows about efficient methods of studying, but does not engage in study behavior. Fox suggested, "It is one thing for the student to listen and follow the exposition of study habits; it is another thing for him to put these habits to use outside the classroom" (p. 75). Weigel and Weigel (1967) concluded that "college students in general know how to study, but do not necessarily employ this knowledge" (p. 80). Beneke and Harris (1972) proposed that the major problem in improving students' study habits is persuading the students to actually use the information they have on effective study principles. These comments suggest that programs designed to assist students with their study habits should include two procedures: (1) teaching students an efficient and effective method

of study and (2) techniques which will help insure the implementation of the study method over an extended period of time.

The present study will describe several principles of effective study and the various attempts at teaching these principles to students. The results of the procedures will be evaluated and an alternative method of teaching study skills will be proposed. The effects of the proposed method will be evaluated.

Effective Methods of Study

Robinson (1961) stated that effective study is a method which helps the student "(1) select what he is expected to know, (2) comprehend these ideas rapidly, (3) fix them in memory, and later (4) review efficiently for examinations" (p. 29). Robinson noted that the average student does not use a study method which meets the above criteria. Fox (1962) wrote,

A student's actual study behavior consists largely of acts indirectly relevant to, even competitive with, learning. More than anything else, to study is to read; to read is to peruse written matter as one would peruse a novel or newspaper. To study is to underline passages in a text. But why? Underlining is not the behavior one desires to learn. The underlined passages may be later recognized as important material, but usually we wish the student to reproduce this material, not point to it. To study is to copy into a notebook. But copying behavior itself hardly constitutes education, and generally wastes time.

These common conceptions of study behavior are not only unrelated to effective learning behavior, they more than likely interfere with it. Since the material to be learned is often aversive, and since others agree that copying, reading and underlining constitute study, the student may believe that he has discharged his responsibility by carrying out these behaviors. Moreover, these behaviors are usually accompanied by just enough learning to maintain them. If he fails a test, he commonly complains that unrealistic demands were made of him.

Typical reading behavior is not an efficient learning method. Students will read several pages before they become aware of what they are doing. Even then, they frequently do not know what the chapter is all about. They will press on to new material before they understand necessary concepts that went before. And, of course, they underline and copy. Recitation is minimal and review is merely re-reading that which they did not master the first time. (pp. 78-79)

After reviewing the experimental evidence from many investigations on efficient learning methods, Robinson (1946) devised the SQ3R method of study, a step-by-step procedure to help students learn the principles of effective study. The symbols stand for the five steps which the student is to follow in using the method: survey, question, read, recite, and review. The student is instructed to survey the material, formulate questions on the material, read to answer the questions, recite answers to the questions in their own words, jot down key phrases and clues, then to review periodically. Several other study systems have also used an approach similar to Robinson's, e.g., OARWET (Norman, 1968), OK4R (Pauk, 1962), PQIRST (Spache & Berg, 1966), and SQ4R (Smith, 1961).

The SQ4R method of study is an adaptation of Robinson's SQ3R procedure; step 4 of SQ3R is divided into two steps: recite and "rite". The student is explicitly instructed to recite answers to questions on the reading material in their own words, then to write the question and cue words, phrases or listings to answer the question. Smith (1961) reported that students who followed a single reading of an assignment with an immediate recitation had forgotten only 20% of the material two weeks later. Those who read the assignment with no recitation had forgotten 80% of the material. Smith reviewed several studies which show there are few beneficial effects as a result of students' first attempts at

taking cue notes; after practice, however, students who took cue notes remembered significantly more material than non-notetaking students.

The evidence shows that "recite" and "rite" are effective methods of study. The explicit directions to use both techniques in the SQ4R method of study would suggest this is a beneficial adaptation of the SQ3R method. Edwards (1973) warns, however, that no single study method is a panacea for all of the areas of difficulty in studying.

There is evidence to suggest that there is a positive relationship between effective study habits and academic success. Brown and Holtzman (1965) provided data from freshman students of six colleges that showed that students who earn high grades reported study habits and attitudes which differed from those reported by students who do poorly. Goldman and Warren (1973) found that students with high or low grades endorsed questionnaire items which indicated differences between their study strategies. Lin and McKeachie (1970) found that student study habits contributed to academic achievement independent of college aptitude.

The principles of effective study have been identified and the relationship between study habits and academic performance has been fairly well established, thus for many years educators and social scientists have attempted to help students learn these principles. The attempts have included writing books full of sound advice on the topic (Bird, 1931; Farquhar, Krumboltz & Wrenn, 1960; Whipple, 1916), giving individual counseling to students (Baymur & Patterson, 1960; Goodstein & Crites, 1961; Marx, 1959; Kaye, 1972), forming therapy groups for underachievers (Chestnut, 1965; Sheldon & Landsman, 1950; Thelen & Harris, 1968; Winborn & Schmidt, 1962), and applying learning principles (Doctor, Aponte, Burry & Welch, 1970; Fox, 1962; Jones, 1969).

Evaluation of these various attempts at teaching effective habits is difficult as the findings are often contradictory, e.g., Winborn and Schmidt (1962) reported that freshman underachievers who received group therapy earned significantly lower GPA's than those student underachievers who received no therapy, whereas Chestnut (1965) reported that college student underachievers improved their GPA's following group therapy. The survey data reported by Crisantiello and Cribbin (1956) suggests that studies which show that certain methods are ineffective in improving study habits often go unreported.

Much of the evidence on the effectiveness of various self-management techniques in improving study habits consists of single case reports (Goldiamond, 1965), or inadequately controlled studies, e.g., lack of control groups (Fox, 1962), or very high mortality rate for subjects (Beneke & Harris, 1972; Harris & Ream, 1972). There have been very few studies which have replicated the use of a procedure that has some evidence to suggest that it is effective in helping students improve their study habits.

Adequate evaluation of the results of various procedures to improve study habits is further confounded as the criteria have been varied, and most studies have employed only one criterion measure. The relationship between the criteria used in these studies and actual study behavior has usually not been considered. The most common criterion has been overall improvement in grades, although little or no consideration was given to the possibility that other variables, e.g., number of courses taken, course difficulty, may have influenced grades as well as study habits. Many studies have relied on standardized test scores, scores on self-report inventories of study habits, or on self-recorded behavior as a

criterion measure. Maxwell (1971) noted that standardized tests have limited usefulness in evaluating study skills programs, as the tests rarely measure the objectives of the program that has been taught. The contradictory and inconclusive evidence on the effectiveness of these methods in improving actual study habits suggest that additional research is necessary.

Although evidence indicates that the principles of effective study have been identified and can be taught, the problem of persuading the student to apply the study principles still remains. One approach to this problem is the combination of an efficient method of teaching study principles with a method that will result in the students applying the study principles. One strategy which has had success with many other behaviors has been the use of behavior modification techniques. Most of the study-skills programs which have attempted to utilize these techniques have a common disadvantage; each requires trained personnel who work with individuals or small groups of students. The trained personnel usually serve as a source of evaluation and reinforcement for the students. There is very little evidence to show that students apply the study principles when the study program is over and this source of evaluation and reinforcement is no longer present. It is thus rather expensive in time and money to implement programs which yield no conclusive evidence that students improve or increase their study behavior as a result of the program. A more efficient use of limited resources would be to develop a program which: (a) had evidence to show it was effective, (b) could be used rather easily with ten or more students, (c) did not rely on trained personnel to serve as external sources of evaluation and reinforcement.

One of the alternatives to these programs is to teach students how to apply principles of self-management so that they can learn to use themselves, rather than trained personnel, as a source of evaluation and reinforcement.

Self-Management

Recent research has emphasized the importance and value of self-control or self-management procedures to change behavior. Cautela (1969) defines self-management as any response made by an organism to modify the probability of another response; the essential characteristic is that the organism is itself the agent of change. There has been relatively little research which has investigated the effectiveness of teaching students self-management, i.e., to control their own contingencies, for applying the principles of effective study. This approach has the advantage that the maintenance of the study behavior would not be dependent on the availability of the professional to serve as a source of evaluation and reinforcement.

Cautela (1969), Kanfer (1970[b]), and Bandura (1971) have provided evidence that suggests that self-management techniques are effective in producing behavior change. Kanfer and Phillips (1970) stated that experiments and clinical evidence show that perception of self as the major agent in bringing about improvement increases the predisposition toward further change and continuing personal development. These authors then review evidence which supports the hypothesis that "when a person believes that a noticeable behavior change can be attributed to his own actions rather than to an external agent, he shows a greater persistence in that behavior" (p. 446).

Many investigations have shown that a self-management technique, self-monitoring, has proved effective in helping individuals modify a broad range of behaviors. Evidence has been reported that this technique has been used as a successful treatment for problems of nailbiting (Maletzky, 1974), obesity (Romanczyk, Tracey, Wilson & Thorpe, 1973), alcoholism (Sobell & Sobell, 1973), smoking (McFall, 1970), disruptive behavior in the classroom (Broden, Hall & Mitts, 1971), and student participation in class (Gottman & McFall, 1972).

Johnson and White (1971) and Miller and Gimpl (1971) have provided evidence to suggest that self-monitoring can be effective in helping students improve their study habits. These investigators have reported that students have been able to increase the amount of time they study by using self-monitoring. Both of these studies have relied on the self-report of the student as evidence, although the reliability and validity of the self-reports was not established in either of the studies. Research is needed which includes this type of evidence.

The results of these studies (Broden, Hall & Mitts, 1971; Gottman & McFall, 1972; Johnson & White, 1971; Maletzky, 1974; McFall, 1970; Miller & Gimpl, 1971; Romanczyk, Tracey, Wilson & Thorpe, 1973; Sobell & Sobell, 1973) have been interpreted as evidence for covert self-evaluative processes that may function as conditioned stimuli (Bandura, 1971). Kanfer (1970[b]), Kanfer and Karoly (1972), and Kanfer and Phillips (1970) have theorized that self-monitoring requires an individual to deliberately attend to his or her behavior to record it. This self-recording is accompanied by a subjective self-evaluation; if one observes that their behavior departs from a personally accepted standard of performance, one engages in a self-regulatory process, i.e.,

self-reinforcement or self-punishment. As one observes their behavior changing to conform more closely with their personally accepted standard, these self-regulatory processes cease.

In contrast to the above findings, there have been a number of well designed studies on various behaviors, e.g., smoking (Berecz, 1972), and eating (Mahoney, Moura & Wade, 1973), which have shown no behavior change as a result of self-monitoring. The evidence suggests that self-monitoring is an effective technique for the modification of some behaviors, although more well controlled research is needed to determine for what behaviors and under what conditions self-monitoring is an effective technique for producing behavior change.

The present study is designed to determine whether the research findings concerning the application of self-monitoring can be generalized to study problems. The study is designed to improve on the methodological limitations of previous studies on study habits, and to provide more conclusive evidence of the effects of self-monitoring on the behavior of applying effective study principles.

Statement of the Problem

This study is designed to ascertain: (1) if the systematic use of self-monitoring procedures increases writing answers to questions, a part of the SQ4R method of study, (2) the extent of the relationship between self-recorded study behavior and judges' reports of behaviors, (3) the extent to which judges' reports of study behavior relate with other performance criteria, a self-report inventory of study habits and examination scores.

CHAPTER II

REVIEW OF RELATED LITERATURE

There are many studies and much "expert opinion" concerning studying itself, and there are an abundance of studies that examine the effects of participation in a variety of reading and study-skills programs. The literature and research on study skills has been reviewed by Berg and Rentel (1966), Blake (1954), Entwistle (1960), Entwistle, Thompson and Wilson (1974), and McCullough, Strang and Traxler (1961). The majority of the reviewed studies show that study-skills programs are followed by some short-term improvement in grades, however, Maxwell (1971) suggested that grades which have relevance to the objectives of the study-skills programs may be very different from those which have been used as criterion measures for the effects of the program. Entwistle (1960) cautioned in her review, "the amount of improvement may be statistically significant, but not educationally significant" (p. 250). Maxwell (1971) further warned that the reported studies may not be representative, as studies with positive results are more desirable for publication than those with negative results.

Although there has been much research on study-skills assistance, there are relatively few studies which have examined the value of teaching students to use self-management procedures to change or control their own study behavior. Investigators have examined the effects of two self-management techniques, self-monitoring and self-reinforcement, on study behavior. These studies will be reviewed below, and the methodological limitations of each of the studies will be examined.

Many of the studies have relied on self-recorded behavior as evidence for changes in study behavior. The reliability of this criterion will be examined.

Self-reinforcement

Skinner (1953) suggested individuals are capable of controlling their own behavior by dispensing their own reinforcement contingent upon making certain responses. Many studies have shown that self-administered reinforcement does possess behavior maintenance capabilities for certain responses, e.g., cranking a wheel (Bandura & Perloff, 1967), visual discrimination (Kanfer & Duerfeldt, 1967), classroom learning (Glynn, 1970), and classroom academic behavior (Lovitt & Curtiss, 1969). Many of the studies concerning self-reinforcement have been reviewed by Bandura (1971), Kanfer (1970[b]), and Rimm and Masters (1974). The majority of the studies have shown that self-reinforcement is a promising technique for behavioral change and maintenance.

Self-reinforcement is a technique designed to increase the probability of a designated behavior by the self-presentation of positive consequences or by the removal of negative consequences (Mahoney, 1972). Investigations of the effects of this technique on study behavior have utilized both methods of self-reinforcement.

Fox (1962) taught five college student volunteers SQ3R study principles and to bring their study behavior under stimulus control, to minimize some of the aversive conditions connected with study behavior, and to give themselves positive reinforcement upon successful completion of a study task. During the quarter following the study program, the students reported the continued use of the method, and all showed

improvement in academic achievement, varying from one to four letter grades. The results of this study are rather impressive and suggest that self-reinforcement was an effective technique. This evidence is difficult to evaluate as: the effects of self-reinforcement were confounded with the effects of other variables; the effects of self-monitoring, a component of self-reinforcement, were not analyzed; the study involved only five students and the treatment of each student varied; there were no control subjects; and the evidence that students used the study method and self-reinforcement consisted of self-reports. Regarding future research directions, Fox suggested, "It will be necessary to develop means for obtaining more reliable measures of the student's adherence to schedules, actual time, and so on." (p. 84).

Briggs, Tosi and Morley (1971) used techniques similar to those described by Fox (1962) with ten "high risk" college freshmen. Ten other "high risk" freshmen who received no study assistance comprised a control group. The method of selection of subjects is not described in the study. The results indicated that the experimental group earned a significantly higher mean GPA than did the control group during the semester of the study skills program. The authors suggested that additional research is needed to determine whether the findings are a result of the conditioning procedure and learning the SQ3R method of study, or by either of these alone.

Goldiamond (1965) described a case study involving study problems. A college student was referred to Goldiamond by a clinical psychologist because the student reported that she became sleepy whenever she attempted to study. A procedure similar to that described by Fox (1962) and by Briggs, Tosi and Morley (1971) was used to teach the student to

bring her study behavior under stimulus control. The student reported that she was able to study three hours a day during the last month of the semester, something she had been unable to do previously. Although this is a single case study, the report suggests that the evidence of Fox (1962) and Briggs, Tosi and Morley (1971) may have been a result of students applying stimulus control procedures, rather than applying SQ3R study principles.

Beneke and Harris (1972) designed one of the few procedures to improve study habits which could be used easily and inexpensively with large numbers of students. The authors recruited 38 college student volunteers and taught them a self-control procedure to improve study habits. Their 11 sessions of instruction covered the utilization of stimulus control procedures, self-reinforcement and punishment, and the SQ3R method of study. This study suffered a high mortality rate, with only 17% of the students who had volunteered for the study completing all of the lessons. Students who took the lessons showed a significant gain in GPA in the semester of instruction over the preceding two semesters when compared to students who volunteered for lessons, but did not attend to receive any lessons. Differences among groups in gain in GPA during the two semesters following instruction were non-significant. The authors concluded that the GPA gain was due to students increasing the quality rather than the quantity of their study behavior, although there is no data presented to support this conclusion. Even though students who completed the lessons showed a significant gain in GPA, the effectiveness of the instruction in helping students improve their study habits is uncertain due to the high mortality rate of subjects and the lack of any evidence that the

students applied the instructions to any aspect of their study behavior. There is no evidence to suggest that students used self-reinforcement or self-punishment to modify their study behavior.

Harris and Ream (1972) modified the lessons developed for college students (Beneke & Harris, 1972) for use with high school students. Ten students volunteered to attend lessons, although seven students attended only one lesson; two students attended three lessons, and one student completed all ten lessons. The students who participated in the study received higher grades than non-participants. The authors believe this finding is not a result of participation, but is due to more conscientious students participating and thus they received higher grades. Evaluation of the effects of the study program are not possible due to the small sample and the high mortality rate of subjects.

Jackson and Van Zoost (1972) recruited college student volunteers and showed them videotaped presentations on study skills that included exercises. The students received money for completing the exercises during each session. In one group, the leader paid them according to preannounced monetary values. In another group the students evaluated their performance on the exercise following feedback on acceptable answers, and paid themselves whatever they judged their answers merited. The results were that self-administered and externally controlled reinforcement groups significantly improved their self-reported study habits as measured by the work methods subscale of the Survey of Study Habits and Attitudes. There were no significant differences between these two groups, although both received significantly better scores than a no reinforcement and a no treatment control group. There were no significant differences in academic performance among the groups

during the semester the study skills were presented. The evidence for the effectiveness of the procedures in improving study habits is very weak. Improvement on one of six subscales of a self-report inventory is not very convincing evidence that the procedure had any effect on study behavior. If the authors had attempted to insure that the no reinforcement group in this study self-evaluated their performance, this group could have been similar to a self-monitoring group. There is no data presented to suggest that the students monitored their performance.

The use of a control group of volunteers who received no treatment is, however, a strength in the design of the Jackson and Van Zoost (1972) study. Students who volunteer to participate in a program to improve their study skills may differ from non-volunteers in motivation to improve their grades and study behavior. The lack of any significant differences between the no treatment and the no reinforcement group in this study suggests two possibilities: that the presentations on study skills had no effect on the students' study behaviors, or that the presentations had an effect which could not be measured on the Survey of Study Habits and Attitudes. This type of evaluation is possible in only two of the other reviewed studies (Beneke & Harris, 1972; Briggs, Tosi & Morley, 1971), as none of the other studies have used a control group of volunteers.

Nurnberger and Zimmerman (1970) applied an instrumental avoidance procedure to generate and control thesis writing behavior of a doctoral student who was referred to them by his department chairperson. The treatment plan required the student to deposit sizable postdated checks with the experimenters. The checks would be sent to organizations aversive to the student unless he wrote a pre-selected number of pages.

Within a few months, the student had completed the dissertation. This is the only investigation on study behavior which has used a behavior product, number of written pages, as a measure of the effects of the procedure.

Summary. Several investigators have presented evidence which suggests that students have used the principles of self-reinforcement to modify their study behavior. The evidence is rather weak, considering that two of the studies consist of single case reports; two reported very high mortality rates for subjects, and one study used change on one subscale of a study habits inventory as evidence for improved study habits. It is difficult to evaluate the specific effects of self-reinforcement in several of these studies, as the effects of self-monitoring, a frequent component of self-reinforcement, were not analyzed, and the effects of self-reinforcement were confounded with the effects of learning different study methods and study procedures.

Self-monitoring

Self-monitoring entails instructing an individual to record certain aspects of a specified behavior, e.g., rate, amplitude, duration. Frequently, self-monitoring is not, in and of itself, considered a technique of behavior modification, rather it is considered a method to provide information, i.e., make an individual aware of low frequency desirable behavior or high frequency undesirable behavior, which the individual may then use to modify his or her future behavior. However, it has been noted in several studies that self-monitoring can be a highly reactive procedure resulting in change of the monitored behavior.

These reactive effects often produce desired behavior change, thus self-monitoring may be considered an effective behavior modification procedure.

Most self-monitoring programs have required the subjects to make some type of written record after a specified behavior is emitted, although in a study by Kolb, Winter and Berlew (1968) business students used miniature counters to keep a record of the frequency of their behavior. Bellack, Rozensky and Schwartz (1974) suggested this method of recording, post-behavior monitoring, is effective if the goal is to increase the frequency of a behavior, rather than to decrease the frequency of a behavior.

The evidence from several studies suggests that self-monitoring is an effective technique for the modification of a variety of behaviors in a therapeutic direction. McFall (1970) and McFall and Hammen (1971) reported that college students maintained reductions in smoking behavior following self-monitoring the times they considered smoking, but did not smoke. Gottman and McFall (1972) found that 17 "potential high school dropouts" were able to increase their rate of oral classroom participation when they self-monitored their participation. Broden, Hall and Mitts (1971) instructed two eighth grade students to self-monitor their classroom behavior. The results indicated that the students were able to increase studying behavior and to decrease talking out in class. Herbert and Baer (1972) found that parents increased the attention they gave to desired behavior of their children when they self-monitored their responses to the behavior. Kazdin (1974a) reported three different studies in which self-monitoring resulted in an increase in college students' performance on sentence-construction tasks

when the students were instructed that high performance was desirable. In one of these studies, Kazdin noted that providing a performance goal augmented the reactive effects of self-monitoring. Mahoney, Moore, Wade and Moura (1973) reported that college students who self-monitored their review preparation for an exam remained for significantly longer review sessions than did students who did not self-monitor their behavior. Bellack, Rozensky and Schwartz (1974) reported that individuals who self-monitored their eating behavior prior to consumption of food lost significantly more weight than did individuals who (a) self-monitored their eating behavior after consumption of food, (b) received information on weight control and no self-monitoring instructions, (c) comprised a waiting-list control group. Many other studies concerning the effects of self-monitoring on a wide variety of other behaviors are reviewed by Kazdin (1974[b]).

In contrast to the evidence discussed previously, there have been a number of well-designed studies on various behaviors, e.g., eating (Hall, 1972; Mahoney, 1974; Mahoney, Moura & Wade, 1973; Stollak, 1967), smoking (Berecz, 1972), and nailbiting (McNamara, 1972), which have shown no behavior change as a result of self-monitoring. The evidence suggests that self-monitoring is an effective technique for the modification of some behaviors, although more well controlled research is needed to determine for what behaviors and under what conditions self-monitoring is an effective technique for producing behavior change.

There is some evidence to suggest that self-monitoring can be effective in helping students improve their study habits. Miller and Gimpl (1971) recruited 23 college student volunteers who reported they studied less than ten hours a week for at least one academic quarter.

The authors designed a three-week treatment to help students increase their amount of study time. During the first week, the students were instructed to record the number of minutes studied during each one-half hour period of waking. During the second week, they continued to record study time and gave themselves instructions to increase their study time by a specified amount. During the third week, the students were randomly assigned to one of three conditions: self-record amount of study time; continue procedures from the second week; and continue procedures from the second week and earn points toward final grade in a psychology course for doing so. The self-reports on minutes of study time that occurred during each of the three weeks of treatment were analyzed. The results indicated that all groups reported significant increases in the amount of study time that occurred during the second and during the third week of their participation in the treatment conditions. There were no significant differences in reported study time among groups for any week. The differential effects of self-monitoring, self-instructions, and external reinforcement, i.e., points for final grade, cannot be determined from this study. Since there were no significant differences among groups, the results suggest that the significant increases in study time may have been due to the treatment each group had in common, self-monitoring. This evidence is not conclusive as there was no control group for comparison. These results are in general agreement with other research findings which indicate that self-monitoring can have reactive effects on the monitored behavior and can contribute to desired behavior change.

Johnson and White (1971) analyzed the effect of self-observation of studying behavior on grades of college student volunteers in a self-paced

introductory psychology course. It was hypothesized that self-observation would result in self-reinforcement, positive or negative, depending on the student's performance. To control for the specific effects of self-monitoring, a control group recorded time spent in dating. After six weeks, students who monitored their study behavior had significantly more grade points than did students who did not monitor any behavior. Students who monitored their dating behavior did not differ significantly in grade points from either those who monitored their study behavior or those who monitored no behavior. The findings indicated that there were no significant differences between groups in final grade point totals. The authors offered the explanation that the results obtained for the dating group suggest that self-monitoring one behavior may affect other behaviors, as it could lead to an evaluation of how time and energy are invested in other behaviors, thus leading to a generalized effect. Since the course was mastery graded and 80% of the students earned an A, it is difficult to determine the effects of self-monitoring study behavior. The evidence that shows that after six weeks students who monitored study behavior had more grade points than did students who monitored no behavior is in general agreement with the findings of Miller and Gimpl (1971). The results of these two studies suggest that self-monitoring may be an effective technique in helping students improve their study habits, although the evidence is not conclusive.

Van Zoost and Jackson (1974) showed college student volunteers a similar presentation on study skills and had the students self-administer reinforcement for performance on the exercises as described in their previous study (1972, described previously). At the beginning of the

program, the students were randomly assigned to one of three treatment conditions: a condition in which students only attended the presentations on study skills and did not deliberately monitor any behavior; a condition in which students reinforced their monitoring of study activities; and a condition in which students reinforced their monitoring of library activities, which included studying in the library, browsing in the library, and checking out books. Self-monitoring study activities did not improve reported study habits relative to recording library activities or no recording at all. All groups, however, showed a significant improvement in the study habits subscale scores of the Survey of Study Habits and Attitudes which the authors attributed to the effects of the eight-session study skills program. Since in their previous study, the participants in the program did not differ from the non-participant volunteers, and the study program in the present investigation is described as having similar content, this conclusion seems unwarranted. This study of the effects of self-monitoring is somewhat different from other studies, as the students self-monitored their behavior and reinforced their monitoring behavior; thus the effects of self-monitoring are confounded with the effects of self-reinforcement. Since there were no significant differences among any of the groups, this suggests that neither variable had a measurable effect. The findings of this study on the effects of self-monitoring on study behavior are contradictory to the evidence presented by Johnson and White (1971) and by Miller and Gimpl (1971).

In a third study, Jackson and Van Zoost (1974) presented to 30 college student volunteers a study skills program that was similar to the programs reported in their previous studies. They repeated the

procedure of having students self-administer reinforcement for performance on exercises and required students to keep a daily record of their study activities. One-half of the students were required to teach the contents of each session to a friend, then to self-assess and monetarily self-reinforce their teaching behavior. The other participants in the program did no teaching. Immediately following the program, all students showed a significant improvement in the study habits subscale scores of the Survey of Study Habits and Attitudes. There was a significant interaction which the authors suggest indicated greater gains in reported study habits for those who taught study skills, although they present no evidence to support this interpretation of the interaction. Since there was no control group in this study, it is not possible to determine the influence of self-monitoring study activities on the change in study habits scores.

Reliability of Self-reports

Several authors have designed procedures to improve study habits through the application of self-management procedures which can be used with a fairly large number of students. The effectiveness of the procedures in some of the studies is difficult to evaluate as the evidence rests solely upon the accuracy of students' self-reports about their study habits. The reliability of the self-report or self-recording has not been addressed nor demonstrated in any of the studies. Simkins (1971) and Mahoney (1972) have questioned the reliability of self-recorded behavior. Simkins noted several factors that can contribute to a lack of reliability of self-recording: differences in response criteria used by the self-observer and the independent observer; the

emergence of pre-potent behaviors for the self-observer that are incompatible with self-recording; the behavior record may be more a function of social approval contingencies that are programmed by an authority figure than it is of the independent variables manipulated by the subject. Mahoney noted that the reliability of self-recorded behavior is a methodological problem which complicates the interpretation of many investigations. He stressed the need for a reliability check on self-reported behavioral frequency before the reported successes of applying behavior principles can be adequately evaluated. Kanfer (1970[a]) suggested that having an additional observer or the analysis of the behavioral product can aid in ascertaining the concurrent validity and the reliability of self-recorded behavior. Lipinski and Nelson (1974[a]) suggested, however, that knowledge of observers could serve as a reactive stimulus to change self-recording.

Several investigators have produced evidence which suggests that self-recorded behavior is an unreliable measure. Lipinski and Nelson (1974[b]) found that college students who were instructed to self-record face-touching behavior decreased their reliability with independent observers from .86 to .52 when they were unaware of a reliability check. Broden, Hall and Mitts (1971) instructed a junior high school girl to keep daily self-reports on her study behavior. Fixsen, Phillips and Wolf (1972) instructed six boys, ranging in age from 12 to 16 years, to keep daily records on their room-cleaning behavior. Risley and Hart (1968) asked pre-school children to give daily reports on their behavior. In all of the studies, there was a low degree of correspondence between the self-reports of the individuals and observer reports. Mahoney, Moore, Wade and Moura (1973) asked college students to

self-monitor their review behavior for an examination. The results indicated a very high agreement between actual performance and self-recorded behavior. In the above studies, the subjects and the behaviors varied greatly; nevertheless, the evidence suggests self-recorded behavior is a measure of unknown reliability. Considering this evidence, it becomes difficult to evaluate studies which rely solely on self-recorded behavior as the criterion measure of success.

Miller and Sloane (1974) examined the effect of changing verbalizations about study behavior on the actual rate of studying. The authors used verbal social reinforcement to condition in both positive and negative directions the answers of five out of six volunteer college students to a questionnaire about study-related behaviors. The results indicated that the conditioned verbal response biases had no effect on rate of actual studying. The findings of this study suggest that verbal or written self-reports about study habits may be different from the extent that the study habits are actually used. This suggests that it is not possible to adequately evaluate the findings of studies which rely on self-reports about study habits without evidence as to the correlation between the report and actual study behavior.

In three of the reviewed studies, Jackson and Van Zoost presented evidence for improved study habits consisting of self-report on a study habits inventory, the Survey of Study Habits and Attitudes. Bodden, Osterhouse and Gelso (1972) have questioned the adequacy of the Survey of Study Habits and Attitudes as a criterion measure of the effectiveness of educational skills programs. These authors reported that change scores on this inventory were not correlated with GPA change over a two-quarter period. They concluded that changes in scores may occur

irrespective of any actual changes in study behavior. Miller and Sloane (1974) suggested the possibility that the change scores on the inventory may reflect the knowledge the students have learned about effective study techniques; the scores may not reflect the extent that the techniques are actually used. These possibilities further limit the confounded evidence that Jackson and Van Zoost have presented on the effects of self-monitoring of study behavior.

General Summary

A few investigators have presented some evidence that suggest that the application of behavior principles can be an effective procedure in helping students improve their study habits. Fox (1962) and Briggs, Tosi and Morley (1971) designed procedures that helped a very small number of students improve their academic achievement. Goldiamond (1965) reported a procedure that helped a student increase the amount of time she studied; Nurnberger and Zimmerman (1970) designed a procedure that helped a student write pages for his thesis and complete it. Each of the above procedures required each student to meet individually with trained personnel. Other investigators have developed procedures to help students improve their study behavior, but provide only inconclusive evidence on the effects of the procedure (Beneke and Harris, 1972; Goldiamond, 1965; Harris and Ream, 1972; Jackson and Van Zoost, 1972; 1974; Johnson and White, 1971; Van Zoost and Jackson, 1974). These studies have shown mixed and contradictory results, and results that are difficult to evaluate. No one has presented convincing evidence that a procedure has been developed which can be utilized easily in helping 10 or more students significantly improve their study habits.

The proposed study differs from previous studies in numerous ways. The most significant difference is that it will test the effectiveness of a procedure that can be used easily and inexpensively with 10 or more students at once. Previous studies which have presented some evidence that a procedure helped students improve their study habits have relied on frequent individual consultation between student and experimenter. There has been no conclusive evidence reported which shows that an effective procedure has been developed which can be utilized easily and inexpensively, in groups, without trained personnel.

The second difference is that the effects of the procedure on study behavior will be measured by observing study behavior. Previous investigations, with one exception (Nurnberger and Zimmerman, 1970), have used less direct measures of behavior change. Some investigators have used self-recorded behavior, although the reliability and validity of the self-record was usually not considered; others have used scores on a self-report inventory on study habits, although it is uncertain whether improved scores reflect actual changes in study behavior. Several studies have used improvement in grades as evidence for improvement of study behavior. Little or no consideration was given to the possibility that grade improvement may be a result of variables other than study behavior, e.g., easier courses were selected, fewer courses were selected; thus, it is difficult to determine whether grade improvement reflects a change in study behavior. The proposed study will incorporate these less direct measures, self-recorded behavior, scores on a self-report inventory and examination scores to determine the relationship between study behavior and these measures which have been used previously.

Finally, the proposed study will use a control group to compare the effects of participation and non-participation in a procedure designed to increase the frequency of students' application of effective study principles. Few of the reviewed studies used a control group in the design, and none presented conclusive evidence concerning differential effects of participation or non-participation in the treatment.

CHAPTER III

RESEARCH METHODOLOGY

Subjects

The subjects for the experiment were 46 undergraduate student volunteers from the University of Maryland, College Park Campus, who were enrolled in English 101, Introduction to Writing, during the first six week summer session of 1975. Subjects were recruited from these classes for three reasons: (1) they appeared to represent a cross-section of the college student population, as all University of Maryland undergraduates are required to take this course, (2) it seemed probable to the experimenter that a sufficient number of volunteers could be recruited to test the effects of the procedures with appropriate statistics, (3) the instructors were using textbooks which met criteria established by the experimenter and volunteered the use of class time for the experiment.

Subjects range in age from 18 to 34, the mean age being 20.7 years. There are 28 female and 18 male subjects. They are distributed among the four classes as follows: freshmen, 10; sophomores, 27; juniors, 5; and seniors, 4. Twelve of the subjects are from minority groups: Black, 6; Oriental, 4; "Other", 2.

Procedures

Prior to the beginning of the first summer school session, the experimenter contacted instructors of several multi-section courses to ascertain whether: (a) the number of students pre-registered for the course was at least 150, (b) the sections had similar requirements and

textbooks, (c) at least one of the required textbooks was presented in an organized outline sequence, and the organization was further to be pointed up by headings and summaries, (d) the instructors were willing to volunteer class time for the experiment once they were informed of its purpose. As a result of this procedure, English 101 was determined to have met criteria 1, 2, and 3, and the instructors of these courses volunteered class time for recruitment and testing of Ss and for demonstration of the SQ4R method of study. The instructors agreed to be absent from the classroom during these times in an attempt to insure that student participation and performance were not a function of instructor approval.

The experimenter designed questions on the content of the first seven chapters of Writing with a Purpose (McCrimmon, 1974), one of the two required textbooks for the course. Instructions were prepared for students on how to use and answer the questions (Appendix A). Three graduate students, all of whom had previous teaching experience, served as judges or raters of the answers to these questions. The experimenter developed the rating criteria and provided approximately nine hours of instruction to the judges on the elements necessary for an answer to be rated as correct. Three students who were not part of the experimental group used the questions and provided answers that could be used for training purposes.

The judges practiced applying the criteria to two sets of 17 answers. The judges rated the quality of each answer by assigning a rating of "correct," "partially correct" or "incorrect," and recorded the number of answers written and the number of correct answers. After rating each set of answers, the ratings were discussed until consensus

was reached. The judges then rated a third set of answers to 17 questions; the inter-rater reliability for this trial was calculated by using the analysis of variance procedure described by Winer (1962); a co-efficient of .69 was calculated. Inspection of the ratings revealed that the judges had perfect agreement on the number of answers written and a very high rate of agreement on the number of correct answers. There was a low rate of agreement among the ratings of answers that were not correct. The rating categories were changed to "correct" and "incorrect or partially correct." The inter-rater reliability was calculated on these categories; the co-efficient of .96 was judged by the experimenter to be sufficiently high.

During the first day of classes, the experimenter visited each class and invited students to participate in a program designed to help them learn an efficient and effective study method. The experimenter presented a brief summary of the research that demonstrates the effectiveness of the SQ4R method of study. Students were informed that materials would be provided that could help them learn the method and apply the study principles to some of the textbook material for the course. As a result of this procedure, 47 students agreed to participate.

Immediately after volunteering for the program, each of the 47 students completed a six item screening survey that was designed by the experimenter. The purpose of the survey was to identify any students who frequently used SQ4R principles (Appendix B). Students who indicated they used three or more of the study principles "frequently," "generally," or "almost always" were to be considered as students who frequently use the SQ4R study method. Based on the responses to the survey, it was

determined that none of the 47 students used the SQ4R method. The students then completed the 50 items which comprise the Delay Avoidance and the Work Methods Scales of The Survey of Study Habits and Attitudes-Form C (Brown & Holtzman, 1965). When the students returned the answer sheets and the test booklets, each received a packet of materials.

The packet contained a handout on the SQ4R method of study. This information was excerpted from Learning to Learn with the permission of the editor. This book was designed to be self-instructional and to provide detailed information on the rationale and methods to improve learning. The students were given information on the rationale for each of the six principles of the SQ4R method of study and instructions on how to apply each of the principles. The information on each of the principles was followed by a comprehension exercise to test understanding of the information presented.

The packets also contained copies of the questions on the first seven chapters. The students were told there would be an examination on these chapters in four weeks, and that their goal was to try to answer: 25 questions during the first week; 17 questions during the second week; 21 questions during the third week; and 16 questions during the fourth week. Students were informed that scores on the examination would not be reported to the instructor.

One-half of the packets (25) contained report forms on which students were asked to record the number of questions they attempted to answer each day (Appendix C). These packets were randomly placed among the packets, thus it is assumed that the students who received these instructions were randomly selected.

Two days after receiving the above material, all experimental students during regularly scheduled English 101 class time watched a demonstration of the application of the SQ4R method of study to a selection of reading materials. After the demonstration, students were encouraged to ask questions on the study method. Students were then asked to demonstrate their understanding of the method by completing an exercise. This exercise was excerpted from Learning to Learn with the permission of the editor. It was designed to assess the extent to which students have learned to apply the first five steps of SQ4R. The written questions and answers, the completion of step five of the exercise were judged by the experimenter. If students were unable to demonstrate that they could formulate questions from the mainheadings and answer each question correctly, they were to be asked to review the SQ4R procedure until they could do so. This was unnecessary as all students demonstrated that they could apply the SQ4R method correctly.

After the demonstration, the only contacts between the experimenter and the subjects were to collect forms once a week from those students who received them in their packets of materials. Four weeks later, each student completed the 50 items which comprise the Work Methods and the Delay Avoidance Scales of The Survey of Study Habits and Attitudes-Form C (SSHA) and an examination based on the content of the first seven chapters of the textbook. The questions were a sample taken from the study questions they received during the first week of classes (Appendix D). At that time, the experimenter asked the students to return the copies of questions they had received and the answers they had written to the questions. Until this time, the students were not informed

that their answers would be collected. This was done to insure the unobtrusiveness of the judges. The next day, the answers were returned to the students and the purpose of the study was explained.

Experimental Conditions

Self-monitoring Group. This group received report forms on which they were instructed to record daily the number of questions to which they had written answers. The students turned in a report form to the experimenter each week. Throughout the study, the experimenter made no comments concerning anything that was on the report form. This was done to minimize the possibility that the reports would be influenced by social approval contingencies.

The group was not informed that their answer sheets would be collected in four weeks to serve as a measure of the concurrent validity of the self-reports of the number of questions answered.

Control Group. This group received the same goals, questions and instructions as the self-monitoring group, except they were not instructed to record daily the number of questions to which they had written answers. The control group was used in this study so that the effects of learning material on SQ4R, receiving study questions and study goals could be isolated from the effects of self-monitoring.

Dependent Variables

Ratings of Written Answers. The effects of the procedure on increasing writing answers to questions that have been formulated on the reading material, were measured by having a pair of previously trained judges independently rate the students' written answers to questions.

An answer was considered correct when the pair of judges rated it as correct; if the judges' ratings differed, the answer was considered incorrect. The judges did not know which other judge would also rate the same answers; they were not informed of the purpose of the study and had no knowledge of expected results.

The relationship between study behavior, defined as writing answers to questions on the reading material, and measures of study behavior that have been used in previous studies was determined by using the measures described below.

Self-recorded Behavior. Students in the self-monitoring group were asked to keep a daily record of the number of questions to which they had written answers. The students returned these self-report records each week. The number of answers reported was recorded.

Written Examination. An examination based on the written material was administered to each student following treatment conditions. The scores on the examination were determined by the judges who had previously scored these questions.

Survey of Study Habits and Attitudes. Each student completed the items which comprise the Study Habits subscale of The Survey of Study Habits and Attitudes-Form C (SSHA), a self-report inventory. This inventory is designed to identify students whose study habits and attitudes are different from those of students who earn high grades. Students are asked to rate the extent that each of the statements represents their actions or attitudes. Students are directed to respond to each statement in one of five ways: rarely, 0-15% of the time; sometimes, 16-35% of the time; frequently, 36-65% of the time; generally, 66-85% of the time; always, 86-100% of the time.

The inventory yields four subscores, each based on 25 items, which are labeled: Work Methods (WM), Delay Avoidance (DA), Teacher Approval (TA), and Education Acceptance (EA). The WM and the DA scores can be summed to yield a score labeled Study Habits (SH); the TA and the EA scores can be summed to yield a score labeled Study Attitudes (SA); all subscores can be summed to yield a total score, labeled Study Orientation (SO). Brown and Holtzman (1965) reported in the test manual that test-retest reliabilities were calculated for each subscore after four and 14 week intervals. The coefficients reported vary from .83 to .94. Validity evidence reported in the test manual consists of low correlation co-efficients which range from .05 to .27 between SO scores and scholastic aptitude test scores (American Council on Education Psychological Examination, Scholastic Aptitude Test, and the School and College Ability Test), and higher correlations between SO scores and grades; the co-efficients range from .25 to .45. These correlation coefficients suggest that the SSHA is measuring traits which are related to academic success, but which are not measured by scholastic aptitude tests. The test manual describes weighted averages of intercorrelations of subscale scores which range from .49 to .71. These were obtained by converting each r to its Fisher's z -function, weighing by the appropriate number of cases, averaging the values, then reconverting.

Only the SH score was used as a measure of study habits in the present investigation. The 50 items which comprise the SH subscale were reproduced by permission for research purposes only.¹ The WM and the DA

1 The Psychological Corporation, publisher of the test, has noted: "Since there is evidence to indicate that item responses obtained to selected items isolated from the context of an inventory such as the Survey of Study Habits and Attitudes may not be comparable to those obtained within the context, the results of this research should not be considered applicable to the standardized complete form of the inventory."

subscale scores were not used as the high intercorrelation coefficients suggest that there is considerable overlap among subscales. The SH score was selected as a measure as it was designed to reflect promptness in completing academic assignments, and how-to-study skills. Attitudes regarding coursework are outside the realm of this investigation, therefore, the SO, TA, and the EA scores were not used.

Hypotheses

Research hypotheses were stated in the null form:

- 1) There is no difference between the number of written answers reported by the judges for each group.
- 2) There is no difference between the number of correct written answers reported by the judges for each group.
- 3) There is no difference between the number of written answers reported and the number of written answers recorded by the judges.
- 4) There is a correlation of 0 between judges' reports of number of written answers and the self-reports of the self-monitoring group on the number of written answers.
- 5) There is a correlation of 0 between judges' reports of number of correct written answers and examination scores for all subjects.
- 6) There is no difference between the examination scores of the two groups.
- 7) There is a correlation of 0 between judges' reports of number of correct written answers and SH post-test scores for all subjects.
- 8) There is no difference between the post-test SH scores of the two groups.

Data Analysis

Hypotheses 1, 2, 3, and 6 were tested by using a one-way analysis of variance (ANOVA) procedure. The data were tested for homogeneity of variance using Hartley's $F_{(max)}$ test.

Hypotheses 4 and 5 were tested by calculating the correlation coefficients; a t test was used to test for significance (Ferguson, 1959).

Hypothesis 7 was tested by calculating a part correlation coefficient (McNemar, 1969); a t test was used to test for significance.

Hypothesis 8 was tested by using an analysis of covariance (ANCOVA) procedure. The data were tested for homogeneity of variance and for homogeneity of regression.

For all tests of significance, the .05 level was selected rather than the .01 level as the experimenter determined a Type I error would be less costly than a Type II error. This judgement was based on the minimal expense of the procedures used in this study compared with procedures used previously.

CHAPTER IV

RESULTS

Reported in this chapter are the results of the data analyses on each of the hypotheses presented in Chapter III. The findings are organized in terms of the three purposes of the study, to ascertain: (1) if the systematic use of self-monitoring increases writing answers to questions, a part of the SQ4R method of study, (2) the extent of the relationship between self-recorded study behavior and judges' reports of behavior, (3) the extent to which judges' reports of study behavior relate with other performance criteria, a self-report inventory of study habits and examination scores.

For all hypotheses, the homogeneity of variance for the control group and the experimental group was tested and accepted in all cases ($p > .05$). The mean and standard deviation of each of the dependent variables are presented in Table 1.

TABLE 1
SUMMARY TABLE: MEANS AND STANDARD DEVIATIONS
OF EACH DEPENDENT VARIABLE

| Variable | Control Group | | Self-monitoring Group | |
|----------------------------------|---------------|-------|-----------------------|-------|
| | \bar{X} | S.D. | \bar{X} | S.D. |
| SH post-test scores | 50.88* | 18.69 | 50.26* | 20.22 |
| Examination scores | 42.22 | 14.23 | 42.09 | 17.28 |
| Answers, judges' reports | 17.35 | 20.17 | 32.86 | 28.08 |
| Correct answers, judges' reports | 13.61 | 15.05 | 26.26 | 23.14 |
| Answers, self-report | — | — | 41.35 | 29.96 |

*adjusted mean

Effects of Self-monitoring

For each of the three pairs of judges, the correlation between ratings of the number of answers was 1.00; the correlation between ratings of the number of correct answers was .99. The ratings have adequate reliability to measure the effects of self-monitoring on writing answers to questions.

Hypothesis 1 was as follows: There is no difference between the number of written answers reported by the judges for each group. The data relating to this hypothesis are presented in Table 2. The F value of 4.6346 is sufficiently large to indicate that the self-monitoring group answered a significantly greater number of questions than did the control group. ($p < .05$).

TABLE 2

ANALYSIS OF VARIANCE SUMMARY TABLE
FOR THE NUMBER OF ANSWERS

| Source | <u>df</u> | <u>SS</u> | <u>MS</u> | <u>F</u> |
|-----------|-----------|------------|-----------|----------|
| Treatment | 1 | 2770.6304 | 2770.6304 | 4.6346* |
| Error | 44 | 26303.8262 | 597.8142 | |
| Total | 45 | 29074.4565 | | |

* $p < .05$

Hypothesis 2 was as follows: There is no difference between the number of correct written answers reported by the judges for each group.

The data relating to hypothesis 2 are presented in Table 3. The F value of 4.8329 is sufficiently large to indicate that the self-monitoring group wrote a significantly greater number of correct answers than did the control group. ($p < .05$).

TABLE 3

ANALYSIS OF VARIANCE SUMMARY TABLE
FOR THE NUMBER OF CORRECT ANSWERS

| Source | <u>df</u> | <u>SS</u> | <u>MS</u> | <u>F</u> |
|-----------|-----------|------------|-----------|----------|
| Treatment | 1 | 1840.8916 | 1840.8916 | 4.8329* |
| Error | 44 | 16759.9131 | 380.9071 | |
| Total | 45 | 18600.8047 | | |

* $p < .05$

Reliability of Self-recorded Behavior

Hypothesis 3 was as follows: There is no difference between the number of written answers reported and the number of written answers recorded by the judges. The data relating to this hypothesis are presented in Appendix E. Analysis of variance yielded an F value of .9803; this indicates there are no significant differences ($p > .05$) between the number of answers reported by the judges and the number that were self-reported.

Hypothesis 4 was as follows: There is a correlation of 0 between judges' reports of number of written answers and the self-reports of

the self-monitoring group on the number of written answers. A graphic presentation of the data relating to hypothesis 4 is shown in Figure 1. The correlation between judges' reports of number of written answers and self-report of written answers is .6768 which is significant ($t = 4.213$, $df = 21$, $p < .05$).

Study Behavior and Other Criterion Measures

Hypothesis 5 was as follows: There is a correlation of 0 between judges' reports of number of correct written answers and examination scores for all subjects. The correlation of the judges' reports with examination scores is .7650 which is significant ($t = 5.443$, $df = 44$, $p < .05$). A correlation matrix is presented in Appendix F.

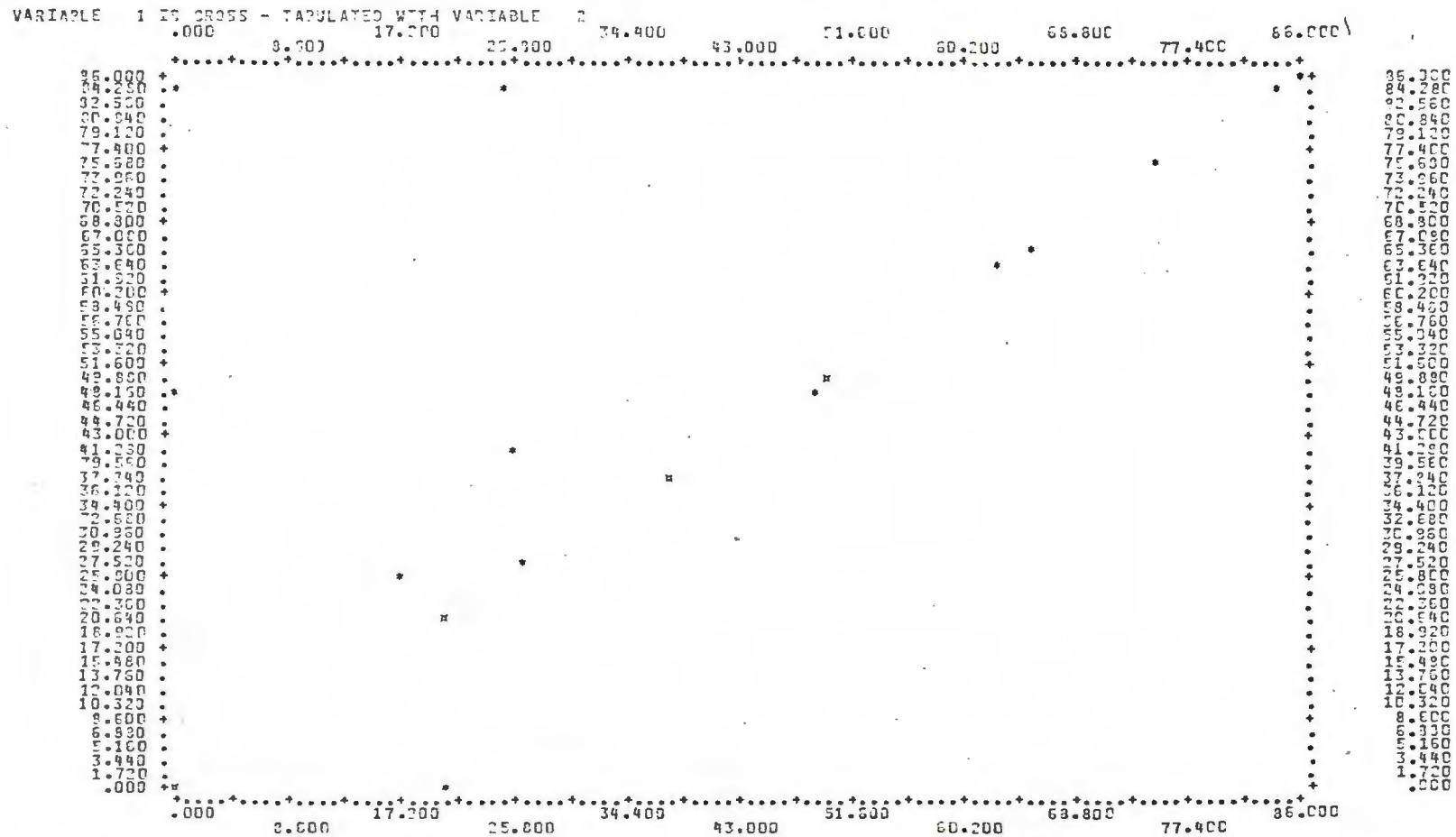
Hypothesis 6 was as follows: There is no difference between the examination scores of the two groups. The data relating to this hypothesis are presented in Appendix G. The analysis of variance summary table shows no significant difference ($p > .05$) between the examination scores of the two groups.

Hypothesis 7 was as follows: There is a correlation of 0 between judges' reports of the number of correct written answers and SH post-test scores for all subjects. A part-correlation coefficient was calculated to establish the correlation between the number of correct answers with the residual of the SH post-test scores with the variance accounted for by the pre-test SH scores partitioned out. The part-correlation coefficient is .1126; this converts to a Z value of .729 which is nonsignificant ($p > .05$).

Hypothesis 8 was as follows: There is no difference between the Post-test scores for all subjects. The data relating to this hypothesis

are presented in Appendix H. The analysis of covariance summary table shows no significant difference ($p > .05$) between the post-test SH scores of the two groups. The SH pre-test scores were selected as a covariate as the correlation of pre-test scores with post-test scores is .93. The assumption of homogeneity of regression was tested and accepted ($p > .05$).

FIGURE I
SCATTER DIAGRAM:
SELF-REPORT CROSS-TABULATED
WITH JUDGES' REPORTS



CHAPTER V
SUMMARY, DISCUSSION AND CONCLUSIONS

Summary

The present study was designed to investigate the effects of the systematic use of self-monitoring on writing answers to questions, a part of the SQ4R method of study. The effects of self-monitoring were measured by observing study behavior. Less direct measures of study behavior, self-recorded behavior, self-report inventory scores, and examination scores, were examined to determine the relationship between observed study behavior and these measures which have been used in previous studies.

Forty-six undergraduate student volunteers were randomly assigned to either the treatment or to the control group. All students completed the items which comprise the SH score of the Survey of Study Habits and Attitudes, received information on the SQ4R method of study, watched a demonstration of the application of SQ4R, then demonstrated that they could apply the study method to a selection of reading materials. All students received copies of questions formulated by the experimenter on the content of a textbook that was required reading for an English course.

Students were instructed to read the chapter to answer the questions that were provided, recite the answers in their own words, then write the answers, using only key words. Students were instructed to answer a certain number of questions each week, and were told there would be an examination in four weeks. Information was not provided to the students that the answer sheets would be collected after four weeks,

and that judges would rate the quality and quantity of their answers. Students who were assigned to the self-monitoring group received report forms on which they were instructed to record daily the number of questions to which they had written answers; the forms were collected each week. The control group received the same goals, questions, and instructions as the self-monitoring group, except they were not instructed to record the number of questions to which they had written answers.

Conclusions, discussion and implications of the results of this study are presented for each of the following sections introduced in Chapter IV: Effects of Self-monitoring, Reliability of Self-recorded Behavior, Study Behavior and Other Criterion Measures. Finally, the limitations of the study will be presented.

Effects of Self-monitoring

Conclusions and Discussion. The hypotheses were that there would be no differences between the number of written answers or the number of correct answers reported by the judges for each group.

The results indicate that self-monitoring did produce a significant increase in the target behavior of writing answers to questions. The group who self-monitored the frequency of writing answers to questions wrote a significantly greater number of answers than did the group who did not self-monitor this behavior. The self-monitoring group also wrote a significantly greater number of correct answers than did the group who did not monitor their study behavior. These findings are in general agreement with the findings of Johnson and White (1971) and those of Miller and Gimpl (1971). The findings also corroborate previous reports which have shown that self-monitoring is an effective

technique for producing behavior change, e.g., Bellack, Rozensky and Schwartz (1974), McFall (1970), and McFall and Hammen (1971).

The present study appears to provide an economical and effective procedure for improving study habits. This study has provided evidence that principles of effective study were learned by more than ten students with minimal professional assistance, and that self-monitoring is a method which increases application of at least one step of a method of effective study.

The self-monitoring group in this study engaged in post-behavior monitoring, i.e., they recorded the number of questions written after the behavior occurred. This finding is not interpreted to imply that post-behavior monitoring of any aspect of study behavior will result in an increase in the frequency of that aspect. If self-monitoring is to be an effective technique for desired behavior change, the monitoring instructions must be specifically tailored for each behavior. The effects of pre-behavior or post-behavior monitoring of other aspects of study behavior are unknown, e.g., number of times during the day the student attempted to answer questions, amount of time spent answering questions, or monitoring behaviors which compete with answering questions. Since the previous findings of the effects of self-monitoring are inconsistent, additional research is needed to determine whether self-monitoring would increase the frequency of each aspect of study behavior, and whether self-monitoring of any particular aspect of study behavior is more beneficial than self-monitoring other aspects. This may vary from course to course as different aspects of study behavior are more relevant to one course than to another.

Bellack, Rozenky and Schwartz (1974) have suggested that post-behavior monitoring is most effective for making individuals attend to low frequency desirable behaviors, and pre-behavior monitoring is most effective for reducing undesirable behaviors. One possible explanation for the effects of post-behavior monitoring on desirable behaviors is that self-recording a desirable behavior could serve as a positive reinforcement for an individual, thus the probability of continuing the self-recording is increased. Post-behavior monitoring of undesirable behaviors could serve as a negative reinforcement for an individual, thus the probability of continuing the self-recording would be decreased.

Since the results of this study and those of previous studies suggest that self-monitoring study behavior results in an increase in the frequency of study behavior, this would suggest that self-monitoring would be a helpful method for students to incorporate into their study habits. The present study investigated the effects of self-monitoring on the study behavior of student volunteers; additional research is necessary to determine whether required self-monitoring, e.g., as a course requirement, would have the same beneficial effects as volunteer self-monitoring.

Reliability of Self-recorded Behavior

Conclusions and Discussion. The hypotheses were that there would be no difference between judges' reports of number of written answers and self-recorded behavior reports, and there would be a correlation of 0 between these two reports.

Analyses of the data relating to self-recorded study behavior and judges' reports of study behavior indicated there was no significant

difference between the reports, and that the correlation between the reports was significant and positive. This evidence suggests that self-recorded behavior is an adequate criterion measure of actual study behavior.

The results of the present study indicate that the influence of self-monitoring on the application of study principles does not depend upon highly reliable recording on the part of the student. This finding corroborates the evidence of previous studies, Broden, Hall and Mitts (1971), Fixsen, Phillips and Wolf (1972), and Herbert and Baer (1972). One possible explanation is that the act of self-monitoring and the feedback received from the self-monitoring behavior record contribute independently to behavior change.

Self-recorded study behavior is an adequate criterion measure of study behavior, although there are greater chances of experimental error if one selects to use a measure which has a reliability of this magnitude rather than a measure which has evidence to suggest it is more reliable, e.g., ratings of independent observers. It is not possible to specify how high the reliability of a measure of a dependent variable should be in a particular experimental study, although it is preferable to reduce the chance of error as much as possible. Mills (1969) suggested that if one finds significant differences between experimental conditions, the measurement of the dependent variable can be considered reliable enough.

The evidence from this study suggests that future investigations of study behavior could rely on self-recorded study behavior as a criterion measure. It is not always possible to use unobtrusive observers to measure study behavior as students often study at many different times

and places which are not available to observers. The presence of an observer would be expensive and it is probable that their presence would have an effect upon behavior.

Study Behavior and Other Criteria

Conclusions and Discussion. The hypotheses were that there would be no difference between the examination scores and the post-test SH scores for the two groups, and that there would be a correlation of 0 between these two measures and judges' reports of behavior.

The results indicated there was no significant difference between the two groups on examination scores, although there was a significant difference between the two groups in the frequency of applying one principle of effective study, i.e., differences in the number of questions they answered correctly. This evidence suggests that changes in one aspect of study behavior have little or no relevance to academic achievement. It may be that larger differences in the application of one study principle are required to detect a difference on examination scores. Another possible explanation is that the examination was too easy and produced a ceiling effect; there may have been little room to show any difference between the conditions, therefore any increase resulting from the independent variable.

The results show no differences between the examination scores of the two groups; one implication of this finding is that participants in study-skills improvement programs should be informed that changes in certain aspects of study behavior may not result in a significant improvement in their academic achievement.

Although the examination used in the present study was a gross

measure, the use of a sample taken from the study questions students received during the first week would suggest the examination had some degree of validity as a measure of performance of writing answers to questions.

One implication of this finding would be that examination scores or grades in courses which have even less relevance to the behavioral goals of a study-skills program would be inferior measures of whether the behaviors had been learned and were applied. Changes in only one or a few aspects of study behavior may not result in a change in grades. It would be preferable to use observed study behavior or self-recorded study behavior to measure whether students apply the behaviors.

The results indicated that there were no significant differences between the groups in self-reported study habits as measured by the SH scale of the SSHA, although there was a significant difference between the groups in frequency of writing answers to questions. This finding plus the very low correlation of .11 between study behavior and the self-report inventory scores shows that the SH scale has very low validity as a measure of the effects of the procedures used in this investigation. The goal of the procedures was to increase the application of one principle of effective study. Although self-recorded behavior and judges' reports indicated the goal was accomplished, the scores on the SH scale did not reflect any changes in behavior. The evidence substantiates the warning of Maxwell (1971) who wrote that standardized tests have limited usefulness in the assessment of educational skills programs as the tests rarely measure the objectives of the programs.

Although the evidence of this study suggests the SH scale is a highly reliable measure, the evidence shows that ratings of behavior and

self-recorded behavior are more valid measures of study behavior than the SH scale, thus it would be preferable to use the former two measures in future studies on the effects of study-skills assistance on actual behavior.

The results suggest several possibilities: the effects of the particular procedures employed in this study were not large enough to be measured by this instrument; that an instrument with as high a test-retest reliability is not subject to change as a result of a four-week program; the behavior of applying one principle of effective study has very little relevance to the particular aspects of study behavior that the scale measures; the low correlation between reported behavior and SH scale scores would suggest the latter possibility; the scale is not adequate criterion measure of an educational skills course as was suggested by Bodden, Osterhouse and Gelso (1972).

The very low correlation between applying effective study principles and self-report inventory scores in the present study still leaves the question of what behaviors, if any, changed as a result of study skills programs that have used changes of a self-report inventory of study habits as evidence of behavior change, e.g., Jackson and Van Zoost (1972; 1974) and Van Zoost and Jackson (1974).

Although there is no reason to suspect that the sample used in the present study differs from the college student population of volunteers, greater confidence in the results would be possible if the results were cross-validated, i.e., select another group and compare the results with those found in the present study.

Limitations

This study was an attempt to effect change in the frequency of application of one principle of effective study, writing answers to questions formulated on reading material. Only one aspect of the complicated chained performance called good study habits was examined. The application of other principles was not examined, although it is assumed that in order to apply this one principle, students also applied the first four principles of the SQ4R method of study. Additional data is needed to verify this assumption. This type of limitation is rather common to self-monitoring studies. A requirement of self-monitoring is to specify which behaviors are to be recorded, thus other behaviors which also occur are lost from analysis.

Additional data is also needed to determine the long-term effects of self-monitoring. The results of self-monitoring may be temporary, i.e., when students cease self-monitoring, their behavior may return to baseline. The SQ4R method of study takes extra time and work to apply until a student gets used to it. It was assumed that self-monitoring would result in sufficient practice in applying the study method so that it would become quick and easy to apply. The efficiency and effectiveness of the method then would become positive reinforcers, thus increasing the probability that the student would continue to apply the study principles.

There are two possible threats to the validity of the findings of the present study: (1) Any effects of the experimenter are difficult to assess. The experimenter recruited the students for the study, demonstrated the application of SQ4R, answered questions on the study

method, administered all measures, and collected report forms. (2)

Student's self-reports about study habits were the criteria for inclusion as a participant in the study. There is no available evidence of the validity of the screening survey.

APPENDIX A
QUESTIONS ON TEXTBOOK MATERIAL

INSTRUCTIONS

- Step 1. Determine the organization of each chapter. Survey the material by reading the introduction and the main headings.
NOTE: A summary is included in chapter four; part of chapter five is also summarized.
- Step 2. Formulate questions by changing mainheads and subheads into questions. Compare the questions you formulated with those on the following pages.
- Step 3. Read to answer the questions on the following pages. If content does not relate to the question, give it only a passing glance.
- Step 4. Recite the answer to the question in your own words.
- Step 5. Write the answer; use only key words.

CHAPTER ONE
Purpose: An Overview

1. What are the three stages of the writing process?
2. What are the two relationships that dominate the act of writing?
3. How does one start to determine a view of the subject?
4. How does one's view of the reader influence writing?
5. What is meant by the "purpose" for writing?
6. Why are decisions about purpose important?
7. What three variables influence the reader's view of the writer?
8. What does the term persona mean?
9. What is a good way to choose a subject for writing?
10. What is the difference between the general subject and the real subject?
11. In what manner is the real subject a restriction?
12. What is meant by a thesis?
13. Where does a thesis usually appear? What is its importance?
14. What are the characteristics of a good thesis?
15. What is a restricted thesis?
16. What is a unified thesis?
17. Why should a thesis be precise?

CHAPTER TWO
Sources of Material

1. What are the four main sources of a writer's material?
2. What transforms personal experience into effective writing?
3. How do observations become important?
4. What is an inference?
5. How can stating a general impression interfere with accurate observation?
6. What two steps should be taken before conducting an interview?
7. What are two important ways of being certain that you get information during an interview?
8. Why is it more difficult to interpret poetry than it is to interpret non-fiction prose?

CHAPTER THREE
Patterns of Organization

1. What are the most commonly used patterns of organization?
2. What is the illustration pattern of organization?
3. What are the two main ways of organizing materials for comparison and contrast? Which is usually the more difficult way?
4. What special form of comparison is used in the analogy pattern of organization?
5. When is the use of analogy very useful?
6. What is classification?
7. What are the three main rules of classification?
8. What is a process?
9. What is necessary for a writer to describe a process?
10. What are the most common types of process essay?
11. Describe two ways of doing causal analysis.

CHAPTER FOUR
Shaping and Testing an Outline

1. What are the differences between a topic outline and a content outline?
2. What are the successive stages for the development of an outline?
3. List five questions that are useful in testing an outline.
4. What is the first and most important step in testing the usefulness of a tentative outline?
5. How would one analyze whether the relationship among the parts of an outline is clear and consistent?
6. What two questions are helpful in deciding whether an outline is complete?

CHAPTER FIVE
Paragraphs: Compositions in Miniature

1. In what ways is a paragraph similar to an essay?
2. What are the four requirements for developing a paragraph?
3. What is meant by unity in a paragraph?
4. How does one determine whether a paragraph is complete?
5. What are four typical orders or patterns in which paragraphs can be developed?
6. What is meant by coherence of a paragraph?
7. What are some transitional devices that are useful in providing coherence in a paragraph?
8. What is the difference between an introductory paragraph and a body paragraph?
9. When would you write a transition paragraph?
10. What can be included in a concluding paragraph?

CHAPTER SIX
Effective Sentences

1. What is meant by rhetorical effect?
2. What are the possible structures of the standard sentence?
3. What is the effect of modifying any of the parts of a sentence?
4. What is the process of coordination? How is it accomplished?
5. What is the process of subordination?
6. What is a parallel sentence?
7. What is a balanced sentence?
8. What is a periodic sentence?
9. What are the usual sources of failure in achieving clarity?
10. What are three ways of obtaining purposeful emphasis?
11. When is a sentence economical?

CHAPTER SEVEN
Right Words

1. When is a word "right" in a sentence?
2. When is a word "accurate" in a sentence?
3. What is the difference between the connotation and the denotation of a word?
4. When is a word "appropriate" in a sentence?
5. What are the main considerations in choosing appropriate diction?
6. What is meant by the term dialect?
7. What are the three types of dialect within the standard dialect?
What are the characteristics of each?
8. What is the main difference between abstract and concrete diction?
9. What are sensory words?
10. What is imagery?
11. What is the main reason for using figures of speech?
12. What figures of speech are most frequently used?
13. What is an analogy?
14. What is a simile?
15. What is a metaphor?
16. What is personification?

17. What is an allusion?
18. When are words vague?
19. What are the chief characteristics of jargon?
20. What are trite expressions?
21. What are two ways that figures of speech can be inappropriate?

APPENDIX B
SCREENING SURVEY

Answer the following questions by indicating whether you rarely, sometimes, frequently, generally, or almost always use the following study principles.

RARELY: from 0 to 15 per cent of the time.
SOMETIMES: from 16 to 35 per cent of the time.
FREQUENTLY: from 36 to 65 per cent of the time.
GENERALLY: from 66 to 85 per cent of the time.
ALMOST ALWAYS: from 86 to 100 per cent of the time.

1. Do you read the questions at the end of a chapter before you start reading the chapter?
2. Do you skim or survey an assignment before reading it?
3. Do you write down key words, listings, etc., that are helpful to you in recalling and reviewing what you read?
4. Do you read selectively, i.e., skim unimportant material and read important material carefully?
5. After reading an assignment, do you try to summarize the important points in your own words?
6. Do you try to formulate questions on an assignment before you begin to read it?

APPENDIX C

SELF-RECORDED BEHAVIOR

REPORT FORM

I am asking a sample of people who receive this study material to report the number of questions that they have attempted to answer. There are four report forms attached. Please record the number of questions that you answer each day. These forms will be collected each Monday morning before class.

I appreciate your co-operation. If you have any questions, please call me (X-2931).

APPENDIX D

WRITTEN EXAMINATION

The following questions are a sample taken from the study questions you received during the first week of classes. Understanding material as you read it does not necessarily mean you learned it. Your score on these questions can give you some indications on whether you have actually learned the material.

1. What are the three stages of the writing process?
2. What does the term persona mean?
3. Where does a thesis usually appear? What is its importance?
4. What are the four main sources of a writer's material?
5. What two steps should be taken before conducting an interview?
6. What are the two main ways of organizing materials for comparison and contrast?
7. What are the four most common types of process essay?
8. List five questions that are useful in testing an outline.
9. What are the four requirements for developing a paragraph?
10. Name four transitional devices that are useful in providing coherence in a paragraph.
11. What is a balanced sentence?
12. When is a sentence economical?

Choose any of the following to answer questions 13 through 16.

Simile
Analogy

Metaphor
Allusion

Personification
Co-ordination

13. A(n) _____ compares two things by asserting that one is like the other.
14. _____ endows abstractions and events with human qualities and abilities.
15. A(n) _____ is an extended comparison of two things which explains one by means of the other.
16. A(n) _____ compares two things by identifying one with the other.

APPENDIX E

ANALYSIS OF VARIANCE SUMMARY TABLE

COMPARISON OF SELF-REPORT AND JUDGES' REPORTS

| Source | <u>df</u> | <u>SS</u> | <u>MS</u> | <u>F</u> |
|----------------|-----------|------------|-----------|----------|
| Between Groups | 1 | 826.6304 | 826.6304 | .9803 |
| Within Groups | 44 | 37103.8232 | 843.2687 | |
| Total | 45 | 37930.4536 | | |

APPENDIX F

CORRELATION MATRIX

| | 1 | 2 | 3 | 4 | 5 |
|---|--------|--------|--------|--------|--------|
| 1 | 1.0000 | .9272 | -.0158 | .0762 | .2164 |
| 2 | .9272 | 1.0000 | .0025 | .1149 | .2190 |
| 3 | -.0158 | .0025 | 1.0000 | .9712 | .7487 |
| 4 | .0762 | .1149 | .9713 | 1.0000 | .7650 |
| 5 | .2164 | .2190 | .7487 | .7650 | 1.0000 |

Variable 1 is SH pre-test scores
 2 is SH post-test scores
 3 is number of answers, judges' report
 4 is number of answers correct, judges' report
 5 is examination scores.

APPENDIX G
ANALYSIS OF VARIANCE SUMMARY TABLE
FOR EXAMINATION SCORES

| Source | <u>df</u> | <u>SS</u> | <u>MS</u> | <u>F</u> |
|-----------|-----------|------------|-----------|----------|
| Treatment | 1 | .1963 | .1963 | .0008 |
| Error | 44 | 11007.7393 | 250.1759 | |
| Total | 45 | 11007.9355 | | |

APPENDIX H
ANALYSIS OF COVARIANCE SUMMARY TABLE
FOR STUDY HABITS POST-TEST SCORES

| Source | <u>df</u> | <u>SS</u> | <u>MS</u> | <u>F</u> |
|-----------|-----------|-----------|-----------|----------|
| Treatment | 1 | 4.3506 | 4.3506 | .0801 |
| Error | 43 | 2335.1296 | 54.3053 | |
| Total | 44 | 2339.4802 | | |

REFERENCES

- Bandura, A. Vicarious and self-reinforcement processes. In R. Glaser (Ed.), The nature of reinforcement. New York: Academic Press, 1971.
- Bandura, A., & Perloff, B. Relative efficiency of self-monitored and externally imposed reinforcement systems. Journal of Personality and Social Psychology, 1967, 7, 111-116.
- Baymur, F., & Patterson, C. A comparison of three methods of assisting under-achieving high school students. Journal of Counseling Psychology, 1960, 7, 83-89.
- Bellack, A., Rozensky, R., & Schwartz, J. A comparison of two forms of self-monitoring in a behavioral weight reduction program. Behavior Therapy, 1974, 5, 523-530.
- Beneke, W., & Harris, M. Teaching self-control of study behavior. Behaviour Research and Therapy, 1972, 10, 35-41.
- Berecz, J. Modification of smoking behavior through self-administered punishment of imagined behavior: A new approach to aversion therapy. Journal of Consulting and Clinical Psychology, 1972, 38, 244-250.
- Berg, P., & Rentel, V. Improving study skills. Journal of Reading, 1966, 9, 343-348.
- Bird, C. Effective study habits. New York: Century, 1931.
- Blake, W., Jr. College level study skills programs. Junior College Journal, 1954, 25, 148-150.
- Blake, W., Jr. Study-skills programs. Journal of Higher Education, 1955, 26, 97-99, 114.
- Bodden, J., Osterhouse, R., & Gelso, C. The value of a study skills inventory for feedback and criterion purposes in an educational skills course. Journal of Educational Research, 1972, 65, 309-311.
- Briggs, R., Tosi, D., & Morley, R. Study habit modification and its effects on academic performance: A behavioral approach. Journal of Educational Research, 1971, 64, 347-350.
- Brown, W., & Holtzman, W. Survey of study habits and attitudes. New York: Psychological Corporation, 1965.
- Broden, M., Hall, R., & Mitts, B. The effect of self-recording on the classroom behavior of two eighth grade students. Journal of Applied Behavior Analysis, 1971, 4, 191-199.
- Cautela, J. Behavior therapy and self-control: Techniques and implications. In C. Franks (Ed.), Behavior therapy: Appraisal and status. New York: McGraw-Hill, 1969.

- Chestnut, W. The effects of structured and unstructured group counseling on male college students' underachievement. Journal of Counseling Psychology, 1965, 12, 388-394.
- Cristantiello, P., & Cribbin, J. The study-skills problem. Journal of Higher Education, 1956, 27, 35-38.
- Doctor, R., Aponte, J., Burry, A., & Welch, R. Group counseling versus behavior therapy in treatment of college underachievement. Behaviour Research and Therapy, 1970, 8, 87-89.
- Edwards, P. Panorama: A study technique. Journal of Reading, 1973, 17, 132-135.
- Entwistle, D. Evaluations of study-skills courses: A review. Journal of Educational Research, 1960, 53, 243-251.
- Entwistle, N., Thompson, J., & Wilson, J. Motivation and study habits. Higher Education, 1974, 3, 379-396.
- Farquhar, W., Krumboltz, J., & Wrenn, C. Learning to study. New York: Ronald Press, 1960.
- Ferguson, G. Statistical analysis in psychology and education. New York: McGraw-Hill, 1959.
- Fixsen, D., Phillips, E., & Wolf, M. Achievement Place: The reliability of self-reporting and peer-reporting and their effects on behavior. Journal of Applied Behavior Analysis, 1972, 5, 19-30.
- Fox, L. Effecting the use of efficient study habits. Journal of Mathetics, 1962, 1, 75-86.
- Glynn, E. Classroom applications of self-determined reinforcement. Journal of Applied Behavior Analysis, 1970, 3, 123-132.
- Goldiamond, I. Self-control procedures in personal behavior problems. Psychological Reports, 1965, 17, 851-858.
- Goldman, R., & Warren, R. Discriminant analysis of study strategies connected with college grade success in different major fields. Journal of Educational Measurement, 1973, 10, 39-47.
- Goodstein, R., & Crites, J. Brief counseling with poor college risks. Journal of Counseling Psychology, 1961, 8, 318-321.
- Gottman, J., & McFall, R. Self-monitoring effects in a program for potential high school dropouts: A time series analysis. Journal of Consulting and Clinical Psychology, 1972, 39, 273-281.
- Hall, S. Self-control and therapist control in the behavioral treatment of overweight women. Behaviour Research and Therapy, 1972, 10, 59-68.

- Harris, M., & Ream, F. A program to improve study habits of high school students. Psychology in the Schools, 1972, 9, 325-330.
- Herbert, E., & Baer, D. Training parents as behavior modifiers: Self-recording of contingent attention. Journal of Applied Behavior Analysis, 1972, 5, 139-149.
- Jackson, B., & Van Zoost, B. Changing study behaviors through reinforcement contingencies. Journal of Counseling Psychology, 1972, 19, 192-195.
- Jackson, B., & Van Zoost, B. Self-regulated teaching of others as a means of improving study habits. Journal of Counseling Psychology, 1974, 21, 489-493.
- Johnson, S. Self-reinforcement vs. external reinforcement in behavior modification with children. Developmental Psychology, 1970, 3, 147-148.
- Johnson, S., & Martin, S. Developing self-evaluation as a conditional reinforcer. In B. Ashem & E. Poser (Eds.), Behavior modification with children. New York: Pergamon Press, 1971.
- Johnson, S., & White, G. Self-observation as an agent of behavioral change. Behavior Therapy, 1971, 2, 488-497.
- Jones, G. Improving study behaviors. In J. Krumboltz & C. Thoresen (Eds.), Behavioral counseling: Cases and techniques. New York: Holt, Rinehart & Winston, 1969.
- Kanfer, F. Self-monitoring: Methodological limitations and clinical applications. Journal of Consulting and Clinical Psychology, 1970, 35, 148-152. (a)
- Kanfer, F. Self-regulation: Research, issues and speculations. In C. Neuringer & J. Michael (Eds.), Behavior modification in clinical psychology. New York: Appleton-Century-Crofts, 1970. (b)
- Kanfer, F., & Duerfeldt, P. Motivational properties of self-reinforcement. Perceptual and Motor Skills, 1967, 25, 237-246.
- Kanfer, F., & Karoly, P. Self-control: A behavioristic excursion into the lion's den. Behavior Therapy, 1972, 3, 398-416.
- Kanfer, F., & Phillips, J. Learning foundations of behavior therapy. New York: Wiley, 1970.
- Kaye, R. A required counseling-study skills program for failing college freshmen. Journal of College Student Personnel, 1972, 13, 159-162.
- Kazdin, A. Reactive self-monitoring: The effects of response desirability, goal setting, and feedback. Journal of Consulting and Clinical Psychology, 1974, 42, 704-716. (a)

- Kazdin, A. Self-monitoring and behavior change. In M. Mahoney and C. Thoresen (Eds.), Self-control: Power to the person. Monterey, Calif.: Brooks/Cole, 1974. (b)
- Kolb, D., Winter, S., & Berlew, D. Self-directed change: Two studies. Journal of Applied Behavior Analysis, 1968, 4, 453-471.
- Lin, Y., & McKeachie, W. Aptitude, anxiety, study habits, and academic achievement. Journal of Counseling Psychology, 1970, 17, 306-309.
- Lipinski, D., & Nelson, R. Problems in the use of naturalistic observation as a means of behavioral assessment. Behavior Therapy, 1974, 5, 341-351. (a)
- Lipinski, D., & Nelson, R. The reactivity and unreliability of self-recording. Journal of Consulting and Clinical Psychology, 1974, 42, 118-123. (b)
- Lovitt, T., & Curtiss, K. Academic response rate as a function of teacher and self-imposed contingencies. Journal of Applied Behavior Analysis, 1969, 2, 49-53.
- Mahoney, M. Research issues in self-management. Behavior Therapy, 1972, 3, 45-63.
- Mahoney, M. Self-reward and self-monitoring techniques for weight control. Behavior Therapy, 1974, 5, 48-57.
- Mahoney, M., Moore, B., Wade, T., & Moura, N. Effects of continuous and intermittent self-monitoring on academic behavior. Journal of Consulting and Clinical Psychology, 1973, 41, 65-69.
- Mahoney, M., Moura, N., & Wade, T. Relative efficacy of self-reward, self-punishment, and self-monitoring techniques for weight loss. Journal of Consulting and Clinical Psychology, 1973, 40, 404-407.
- Maletsky, B. Behavior recording as treatment: A brief note. Behavior Therapy, 1974, 5, 107-111.
- Marx, G. A comparison of the effectiveness of two methods of counseling with academic underachievers. Dissertation Abstracts, 1959, 20, 2144-2145.
- Maxwell, M. Evaluating college reading and study skills programs. Journal of Reading, 1971, 15, 214-221.
- McCrimmon, J. Writing with a purpose (5th ed.). Boston: Houghton Mifflin, 1974.
- McCullough, C., Strang, R., & Traxler, A. Improvement of Reading (3rd ed.). New York: McGraw-Hill, 1961.
- McFall, R. Effects of self-monitoring on normal smoking behavior. Journal of Consulting and Clinical Psychology, 1970, 35, 135-142.

- McFall, R., & Hammen, C. Motivation, structure, and self-monitoring: Role of non-specific factors in smoking reduction. Journal of Consulting and Clinical Psychology, 1971, 37, 80-86.
- McNamara, J. The use of self-monitoring techniques to treat nailbiting. Behaviour Research and Therapy, 1972, 10, 193-194.
- McNemar, Q. Psychological statistics (4th ed.). New York: Wiley, 1969.
- Miller, A., & Gimpl, M. Operant conditioning and self-control of smoking and studying. Journal of Genetic Psychology, 1971, 119, 181-186.
- Miller, S., & Sloane, H., Jr. Generalization of verbal conditioning of study habits. Journal of College Student Personnel, 1974, 15, 455-460.
- Mills, J. The experimental method. In J. Mills (Ed.), Experimental social psychology. New York: Macmillan, 1969.
- Norman, M. Successful reading: Key to our dynamic society. New York: Holt, Rinehart & Winston, 1968.
- Nurnberger, J., & Zimmerman, J. Applied analysis of human behavior: An alternative to conventional motivational inferences and unconscious determination in therapeutic programming. Behavior Therapy, 1970, 1, 59-69.
- Pauk, W. How to study in college. Boston: Houghton Mifflin, 1962.
- Rimm, D., & Masters, J. Behavior therapy: Techniques and empirical findings. New York: Academic Press, 1974.
- Risley, T., & Hart, B. Developing correspondence between the non-verbal and verbal behavior of preschool children. Journal of Applied Behavior Analysis, 1968, 1, 267-281.
- Robinson, F. Effective study. New York: Harper & Brothers, 1946.
- Robinson, F. Effective study (Rev. ed.). New York: Harper & Row, 1961.
- Romanczyk, R., Tracey, D., Wilson, G., & Thorpe, G. Behavioral techniques in the treatment of obesity. Behaviour Research and Therapy, 1973, 11, 629-640.
- Sheldon, W., & Landsman, T. An investigation of non-directive group therapy with students in academic difficulty. Journal of Consulting and Clinical Psychology, 1950, 14, 210-215.
- Simkins, L. The reliability of self-recorded behaviors. Behavior Therapy, 1971, 2, 83-87.
- Skinner, B. Science and human behavior. New York: Macmillan, 1953.

- Smith, D. (Ed.). Learning to learn. New York: Harcourt, Brace & World, 1961.
- Sobell, L., & Sobell, M. A self-feedback technique to monitor drinking behavior in alcoholics. Behaviour Research and Therapy, 1973, 11, 237-238.
- Spache, G., & Berg, P. The art of efficient reading. New York: Macmillan, 1966.
- Stollak, G. Weight loss obtained under different experimental procedures. Psychotherapy: Theory, Research and Practice, 1967, 4, 61-64.
- Thelen, M., & Harris, C. Personality of college underachievers who improve with group psychotherapy. Personnel and Guidance Journal, 1968, 46, 561-566.
- Van Zoost, B., & Jackson, B. The effects on study behaviors of self-monitoring and self-reinforcement. Journal of Educational Research, 1974, 67, 216-218.
- Weigel, R., & Weigel, V. The relationship of knowledge and usage of study skills techniques to academic performance. Journal of Educational Research, 1967, 61, 78-80.
- Whipple, G. How to study effectively. Bloomington, Ill.: Public School Publishing, 1916.
- Winborn, R., & Schmidt, L. The effectiveness of short-term group counseling upon the academic achievement of potentially superior but underachieving college freshmen. Journal of Educational Research, 1962, 55, 169-174.
- Winer, B. Statistical principles in experimental design. New York: McGraw-Hill, 1962.

VITA

Name: Martha Peyton Kazlo.

Permanent address: 307 Walnut Street
Westernport, Maryland 21562.

Degree and date to be conferred: Ph.D., 1975.

Date of birth: November 18, 1945.

Place of birth: Cumberland, Maryland.

Secondary education: St. Peter's High School
Westernport, Maryland
June, 1963.

| <u>Collegiate institutions attended</u> | <u>Dates</u> | <u>Degree</u> | <u>Date of Degree</u> |
|---|--------------|---------------|-----------------------|
| University of Maryland | 1963-1967 | B.S. | June, 1967 |
| University of Maryland | 1970-1972 | M.Ed. | January, 1972 |
| University of Maryland | 1972-1975 | Ph.D. | August, 1975 |

Major: Counseling and Student Personnel Administration.

Minor: Psychology.

Positions held:

Field Advisor, Shawnee Girl Scout Council, Inc., Cumberland,
Maryland, 1967 - 1970.

Research Assistant, Bureau of Educational Research and Field
Services, University of Maryland, College Park, Maryland,
1970 - 1972.

Assistant Director, Commuter Services, University of Maryland,
College Park, Maryland, 1973 - 1974.

Intern, Counseling Center, University of Maryland, College Park,
Maryland, 1974 - 1975.

Part-time Instructor, Community Services, Montgomery College,
Rockville, Maryland, 1975.