A Behavioral Contracting Center for High School Students: Description, Research and Analysis

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A BEHAVIORAL CONTRACTING CENTER
FOR HIGH SCHOOL STUDENTS:
DESCRIPTION, RESEARCH AND ANALYSIS

by

William K. Hedmon

A Dissertation Submitted to the
Faculty of the Graduate
College in partial fulfillment
of the requirements for the
Degree of Doctor of Philosophy
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
April 1981
Most psychologists and educators agree that instructional procedures are most effective when individualized. Unfortunately, most approaches to individualization require that large institutional and training changes occur. Thus, educational programs most commonly apply group methods which focus on a hypothetical "average" learner. An alternative program, called the Guided Study Project, is described. This program is designed to augment group procedures without extensive change in current methods. The Guided Study Project is a school-wide contracting center available to all students of all classes. The procedures involve the use of a daily behavioral contract and the project is managed by students who serve as staff and one adult coordinator. Data are presented on the efficiency of use of the project by teachers and students and for three separate experiments done within the context of the program. Experiment I examined the effects of project use on classroom performance. Experiment II measured performance in the classroom as a function of having students write their own contracts. Experiment III determined if classroom
performance changed when teachers negotiated contracts with students. Contracts were completed at a high rate. Classroom performance improved when students used the program consistently. No performance changes were observed when contract negotiation procedures were varied. An analysis of contracting in terms of the acquisition of self-management skills is presented.
ACKNOWLEDGEMENTS

The project reported here required several years in its development. Thus, literally hundreds of people made valuable contributions to my research. I cannot mention everyone; so I ask those who are omitted for understanding. To all of the students, teachers and administrators of Schoolcraft High School I give my thanks for their understanding throughout the project, and perhaps most importantly, for helping me to be comfortable in their school. Three years with an operant psychologist can be very trying. My thanks to Jane Stinson and Mark Daoust who were my precursors in the project and left it in good condition for me. My appreciation also goes to Steve Ragotzy, Dave Lennox, Steve Hadden, Peg Bird and a host of other follow students who helped me run the project and collect the data.

I also wish to thank Dr. Jack Micheal who helped me in many ways during my studies, and Dr. Wayne Fugua and Dr. William Burrian who served on my committee and waded through the mounds of sometimes questionable material that I produced. And to Dr. Howard Farris -- what can I say -- you gave me whatever I needed whenever I needed it. Thanks. To my friend Sal Cullari I want to say, we made it. Sal is possibly the only person on earth who
understood exactly what this took — he was doing the same thing. Without him, I wouldn't have been able to laugh much, even during the humorous parts. I'm sure there are others but I'll save the last few lines for a quote from a song by Jerry Jeff Walker.

"Gettin' by on gettin' by is my stock trade. Living it day to day. Picking up the pieces wherever they fall. Just letting it roll, letting the high times carry the low. Just living my life easy come — easy go."

Bill Redmon

Dedication

Much of the early work done on the Guided Study Project was carried out by Mark Dooust. Without Mark's work and his careful records, the Project and this research would not have been possible. His untimely death deprived all of us of significant personal and professional contributions.
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CHAPTER I

INTRODUCTION

Frequently, arguments for educational innovation are presented in terms of a contrast between group and individual approaches to instruction (Talbert and Frase, 1972). Group approaches focus on teaching a hypothetical "average" student; some learners are expected to perform above average and others below the typical standard. Individualized programs emphasize the importance of differences in students and advocate the use of planned variation in materials and procedures designed to teach each person according to his/her personal needs.

According to Blake and McPherson (1969), individualization involves several basic characteristics. First, each student assists the teacher in the selection of learning activities. Second, the program must be organized to allow each student to progress at his/her own pace. Third, the teacher must evaluate progress frequently and provide supplemental instruction if necessary. Fourth, sequences of prepared materials must be available for each performance level so that instruction can occur independent of the teacher as much
as possible.

Many psychologists and educators agree that individualize instruction is an ideal way to teach. Skinner (1968) favored an individual approach on the basis of differences in rates of learning and the need for immediate conseqeuation of responses to instructional materials. While Messick (1976) is of a different theoretical orientation, he too supported individualized methods. Messick's argument has its basis in differing cognitive styles and creative learning capabilities which the learner brings to the situation. Support by these authors and others for individualized education is not a recent development. Gagne (1971) pointed out that the roots of this theme are to be found in the works of several of the English philosophers, including John Locke.

Historically, attempts to establish individualized learning programs in the U.S. have taken many forms. Buffie and Jenkins (1971) described the use of "nongraded" schools which focus on the removal of the grade-based progression and use measures of student skill mastery as an indicator of progress for each person. Other recent approaches include large-scale programs such as Individually Guided Education (IGE) as described by Klauzmeier (1975) and Programmed Learning According to
Needs or P.L.A.N. (Flanagan, Shanner, Brudner and Marker, 1975). The use of teaching machines which present instructional materials and provide knowledge of results following practice has also been suggested (Skinner, 1961).

Unfortunately, although some success has been reported, all of the approaches described above require extensive changes in existing instructional programs. Large-scale changes may produce resistance rather than innovation for at least two general reasons. First, as Sulzer and Mayer (1972) pointed out, managers of educational institutions appear to find it more practical to use materials and tests ordered in large quantities that best suit the needs of a large group. Similarly, instructional specialists are hired to address the problems of learners who do not perform well in a group situation, rather than to program for all individuals. Second, personal resistance may be encountered when pervasive change is requested. Comprehensive individualized plans may require additional teacher training, changes in materials and grading practices and place additional demands on teaching personnel (Hunter, 1966; Wilkins, 1972). This problem is especially pronounced at the secondary-school level where teachers are responsible for large numbers of students and a
number of different classes each day. Each class may include wide variations in skill levels and differ in subject matter as well. Under these conditions, record keeping, materials development and frequent assessment of performance increases the work of the teacher who may already have designed a successful group program.

A more practical approach may involve the use of programming that augments and improves group instruction and provides a definite individualized educational component. Over the past decade, some noteworthy individualized methods have been developed for use within a group instructional setting. The Personalized System of Instruction (PSI) (Keller, 1968) has been used with groups of students while allowing individuals to progress through course materials at their own pace. Lectures are used for motivational purposes and are usually optional. The bulk of the instruction is done via carefully prepared materials and study aids. Peer monitors grade papers, administer quizzes and provide assistance to students. Each student receives individual attention, while the cost of professional staff is not increased. Application of the PSI method has resulted in performance superior to that of students taught by traditional methods and also resulted in favorable student reactions to the procedures (McMicheal and Corey, 1969; Sherman,
A second approach to individualization and the major one to be discussed here is contingency contracting (Homme, Csanyi, Gonzales and Reches, 1969). Contingency contracting has been used for various behavior change programs within the classroom (Amsden, 1970) and as a tool to guide and change behavior outside the classroom (Stuart, 1971). Typically, a contract specifies the behaviors which are required on the part of the student and the consequences that follow when the tasks are/are not performed to criterion (Kazdin, 1975). As Stuart and Lott (1972) indicated, the contingency contract is a system which involves an identification and exchange of reinforcers between two parties. The teacher wishes the student to behave in a way that will enhance learning and the student wishes to receive a good grade or privileges associated with some behavior. The contract is usually negotiated between two parties with the student participating to varying degrees in the determination of consequences and behaviors to be performed (Homme, et. al., 1969). The terms of the contract may be predominately controlled by the student or teacher and still work well through negotiation.

In order to individualize using contracting, a teacher must determine what behaviors are to be
performed, specify them to the student and negotiate the terms of the agreement (i.e. the amount and quality of behavior to be exhibited for the kind and amount of reinforcement). The consequences could include points, grades, privileges or other activities that are optional. Both parties sign an agreement in which the conditions are specified and a timeline for completion is given. The teacher must then evaluate the work and if criterion is met, deliver the incentive. Usually if criterion is not met, the rewards are withheld or a penalty is administered. The contract form serves as a record of the task and indicates the results of the learning activity. The form also provides the student with a permanent description of the assignment and the timeline for task completion. The teacher can select group goals for a class and negotiate with students as to the route taken in achieving the stated objectives. Each student participates in the selection of tasks appropriate for his/her performance level.

Contingency contracting has been used with educational institutions of all levels, including elementary schools (Brigham and Amith, 1973); junior high schools (Berta, 1974); senior high schools (Yarber, 1974) and colleges (Warner and Akamine, 1972; Poppen and Thompson, 1971). The earliest applications of
contracting occurred during 1920-30 and were designed to individualize learning programs. Both the Dalton and Winnetka plans included provisions for explicit statements of tasks to be performed. Each student was treated individually in the description of work to be done (Buffie and Jenkins, 1971).

Present-day educational contracting appears to have begun in the late 1960s. Haddock (1967) recommended the use of a contract to individualize curricula. He based his suggestion on Mager's (1962) contention that a good program must specify what is taught, how we will know it has been taught and what materials and procedures will be used to teach. Although Haddock's contract followed a standard format for statement of task, no consequences or guidelines for evaluation were explicitly included. It was assumed that the student would do the work in order to improve his/her grades. However, no contingency relationship was described in the agreement. Haddock's contract did not include a signature from either party. Therefore, the task was defined, described and assigned by the teacher. This general format was later described by Esbensen, (1972) as the Duluth Contract. Esbensen expanded Haddock's approach by making provisions for student choice of a preferred route to the goal. Again, however, no consequences of appropriate performance were
specified in the agreement. Other authors used the Duluth-type contract in order to individualize instruction (e.g. Ogston, 1968). However, for the most part, agreements which stated both behavior and consequences in contingency form began to be used only after Homme, et. al. (1969) described these procedures.

Homme et. al. discussed the importance of consequences and linked educational contracting with reinforcement theory. These authors recommended that reinforcing events (RE) be arranged to motivate students and that the reinforcers should be specified in advance of evaluation (i.e. at the time of assignment). Homme et. al. also emphasized the importance of student participation in the negotiation of contract terms and agreement indicated by signature. This approach went beyond the intentions of earlier contracts. Individualization was seen as a goal of the procedures, however these authors indicated that students should be trained to manage their own contingencies by using the teacher-directed contract as a model for future self-managed behavior.

In the early and mid seventies, the number of publications on educational contracting increased substantially. In contrast with earlier reports, empirical tests of the contracting procedures began to
appear. A limited number of research studies focused on contract grading, where grades (e.g. points, letter grades, etc.) were the only specified consequence of performance. The results of the primary studies present conflicting data. Thompson and Davis (1970) used a contract that specified criteria for a particular grade and optional paths for adequate performance. The results indicated that eighth-grade math students scored significantly better when grades earned by contract were compared to previous performance and the grades of a control group. Williams and Anandam (1973) found contracting to be effective in improving the grades of seventh-grade students. These authors specified appropriate social behaviors in addition to criteria for academic performance. Points were awarded for compliance and "free time" activities were offered as a bonus for exceptional work. However, differences in effectiveness were observed across teachers. Students were asked to evaluate teacher efficiency in applying the management program. Teachers with low efficiency ratings were associated with fewer positive changes in performance.

Other studies of contract grading did not confirm the positive results presented above. Poppen and Thompson (1971) used a contract grading system with college sophomores. The contract specified behaviors
necessary for the acquisition of each grade level. No statistically significant differences were observed when contract group scores were compared with grades earned by a control group. Williams and Anandam (1973) contended that the negative results found by Poppen and Thompson were due to loosely defined behaviors and perhaps to the lack of the response of the older population to available consequences. However, Yarber (1974) also failed to confirm the advantages of contracting over group methods. He found no differences between a contract group and a control group of seventh graders in terms of retention of information. Retention was assessed by a unit exam given five weeks following the end of instruction.

The conflicting results in contract grading research preclude any statement of contract effectiveness. Variations in target populations and procedures across the major studies make conclusions difficult. Other studies of contracting have utilized consequences other than grades for task completion. The outcomes of this body of research are consistent and support the use of contract as an effective tool. Brigham and Amith (1973) combined contracting and a token reinforcement system to intervene with "inconsistent and nonproductive" second-grade students. Subjects chose daily reinforcers from a menu prepared by the teacher and matched these
consequences with the amount of work to be completed. An increase in work rate and accuracy was reported across subjects in a multiple baseline design.

Arwood, Williams and Long (1974) added "free time" to grades as a consequence of contract completion. Students were given the chance to identify high probability "free-time" activities in an interview prior to contracting. Consequences were made contingent on "appropriate classroom behavior" as defined by students and the teacher. A second group completed a behavior proclamation. A proclamation included a specification of appropriate behavior and a description of consequences contingent on performance. The students were given no chance to negotiate the agreement. Most students exhibited higher rates of appropriate behavior under contracting than under the proclamation condition. Appropriate behavior increased under both conditions as compared to baseline.

White-Blackburn, Semb and Semb (1977) found that on-task behavior and grades increased when a good-behavior contract was used with sixth-grade students. The students contracted for existing classroom privileges and were allowed fifteen minutes to complete each task. Positive results were also observed when contracting was used in a remedial reading program
(Schwartz, 1977) and when college students were provided monetary rewards for increased study time (Bristol and Sloane, 1974).

Contracting programs have also been used successfully to improve the performance of special populations of students. Dee (1972) reported an 85% success rate in a school for students who had been removed from regular classrooms. Clements and McKee (1968) used contracts in an educational program for prison inmates. Prisoners enrolled in an academic course earned access to a reinforcing-event area when they completed a predetermined number of frames in a programmed instructional unit.

The studies above involved selected individual students and/or single classrooms. Fewer reports of large-scale use of contract methods with a general population are available. Cantrell, Cantrell, Huddleston and Woolridge (1969) used contracting for intervention in a diagnostic and remedial center for an entire school system (grades one through eleven). McDonald, Gallimore and MacDonald (1970) effectively used contracts to improve the attendance of chronic truants. Although both of these studies reported positive outcomes with broad populations, target behaviors were not academic in nature and occurred outside the school. No reports of the use
of a contracting center for individualization or academic skills support on a school-wide basis could be located.

Based on the above discussion, it appears that contingency contracting can be used to improve group instructional procedures. Furthermore, this method has been shown to be effective across a variety of student age and performance levels. However, existing academic applications of contracting methods have been limited in scope. Most programs have involved only classroom-level procedures (Birdwell, 1972; Raymond, 1975). Unfortunately, no research has been done on the effects of contracting on independent or self-managed performance under circumstances where a contract is no longer used. Ultimately, students must behave appropriately in the absence of contrived conditions and without the allocation of resources for intensive programming.

The purpose of the present paper is threefold:

1. describe a school-wide academic contracting center for high school students;

2. determine the effects of center use on performance in the classroom where a contract is not used; and

3. determine the effects of changes in the environmental support provided by the center on student classroom performance.
CHAPTER II

PROJECT DESCRIPTION

The Guided Study Project (GSP) is designed to provide assistance to high school students with academic work. The GSP is operated from an assigned room in a high school building called the Guided Study Center (GSC).

The GSC provides a structured setting where students can work on academic assignments on a contractual basis. When a student comes to the center, a contract is written (Figure 1). The contract includes a clear specification of the type and amount of work to be accomplished and the time allowed to complete it. Staff members monitor progress and provide assistance if requested. When the work is done or time has expired, a review of the work product is done. The review is based on a present criterion stated in the contract. Each student who uses the center must complete the contract form and agree to the conditions by signing the document. The amount of work to be done is negotiated by the student and a staff member when the contract form is filled in.
Figure 1. Guided Study Center study contract form.
DAILY CONTRACT FOR GUIDED STUDY

IN THE NEXT _____ MINUTES, I WILL COMPLETE THE FOLLOWING TASK(S):

1. TASK 1: RESULTS
   DESCRIPTION:
   CRITERION:
   COMPLETE
   INCOMPLETE

2. TASK 2: RESULTS
   DESCRIPTION:
   CRITERION:
   COMPLETE
   INCOMPLETE

I UNDERSTAND THAT IF I WORK QUIETLY AND IF I HAVE MY WORK REVIEWED BEFORE LEAVING THE GUIDED STUDY CENTER I CAN CONTINUE TO USE THE CENTER.

STUDENT SIGNATURE _________________________

STAFF SIGNATURE ___________________________

PASS INFORMATION

TIME LEAVING __________

DESTINATION __________

SIGNATURE OF COORDINATOR _________________________
The behaviors necessary for continued use of the center are specified in writing (Figure 2). Each student is shown the list of behaviors and reminded that he/she must adhere to the requirements. The Review form is completed for every student who uses the center. If a student receives two checks in the no column, he/she is asked to leave the center and is not allowed to return until a conference is held with a school administrator and permission to return is obtained.

The GSC is designed to be used by students during independent study periods, either in study hall or within a scheduled class period. Teachers may refer students or students may request to use the center. In all cases, the approval of the supervising teacher is required. At the end of the work period, the teacher who authorized the visit is informed of the results of the students' work via a carbon copy of the contract form. The contract carbon also serves as a hall pass for the movement of the student through the building.
Figure 2. A Student Review Form used in the Guided Study Center to monitor behavior.
GUIDED STUDY PROJECT
Student Review Form

Yes  No

1. Obtained GSP pass or contract and had it signed by teacher before coming to GSP area.

2. Completed contract and had it signed by GSP staff member.

3. Arrived at GSP on time.

4. Began working on assignment within four minutes of completing contract.

5. Remained on task 90% of the time.

6. Refrained from disturbing others. (Record each instance and explain below.)

7. Obtained feedback on the following before leaving GSP area: Daily Contract Student Review Form

8. If student left GSP area for a drink, the locker, etc., he had:
   Left with a pass
   Returned within 4 to 5 minutes
   Been working for 4 to 5 minutes

Criterion: In order to continue to have the privilege of coming to the GSP area:

   a) The starred items must have a mark in the Yes column.
   b) A total of six columns must be marked Yes.

Comments:

If you, as staff, observed any problems in the contract or performance, please circle which area(s) correspond:

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<th>TASK</th>
<th>CRITERIA</th>
<th>OFF-TASK</th>
<th>OTHER</th>
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Recorded

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The center is staffed by high school students who receive academic credit for their work. The students receive training in four areas: Writing the contract; helping with study-skill problems; completion of the review form; and providing descriptive feedback on work done.

Student staff members are selected in the following manner:

1. Teachers are asked to provide the names of students who are likely to be competent staff members. (See Figure 3.)

2. All applicants are screened to insure that classroom performance is adequate. A grade-point average of 3.0 or above on a 4.0 scale is required.
Figure 3. Teacher referral form for suggested student staff members.
Dear ______________________

The Guided Study Project will soon be starting for the school year. We need your help in identifying potential student staff members. If there are individuals in your classes who you feel could assist other students in the Guided Study center, please list their names in the spaces below. Since your knowledge of student skills is essential in staff selection, we urge your participation.

Thank You

<table>
<thead>
<tr>
<th>HOUR</th>
<th>POTENTIAL STUDENT STAFF MEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td></td>
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<tr>
<td>4th</td>
<td></td>
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<tr>
<td>5th</td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td></td>
</tr>
<tr>
<td>7th</td>
<td></td>
</tr>
</tbody>
</table>

After completion, please place in the Guided Study Project mailbox in the office. Thank you.
3. Students with an acceptable grade point average are asked to submit an application form (see Figure 4).

4. An interview is scheduled for all applicants.

5. Based on the interview results, two staff members are selected for each hour of center operation.

Each staff member is evaluated weekly in terms of their performance by use of the student staff evaluation completed daily (see Figure 5). Six-week grades are assigned for work done and are entered on the student's report card.

The GSP is supervised by one adult (the center manager). For purpose of this initial research this role is filled by School Psychology graduate students who earn field experience credit for their work at a nearby university. A general list of center manager and student staff responsibilities is presented in Table 1. The adult monitors are trained by the project consultants.
Figure 4. Student staff application form.
Guided Study Project
Application for Student Staff

Name ________________________________
Grade ________________________________

Class Schedule

1st ____________________________ 5th ____________________________
2nd ____________________________ 6th ____________________________
3rd ____________________________ 7th ____________________________
4th ____________________________

List those classes which you have taken, or are currently taking, in which you feel able to help other students.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

What personal qualifications do you have which would aid you in being an effective member of the Guided Study staff?

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

During which class periods would you be able to work?

_____________________________________________________________________________

How many days each week could you work?

_____________________________________________________________________________

List those teachers with whom we may check regarding your qualification as a student staff member.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

Please Note: Some individuals may not be immediately placed as staff members. Scheduling problems, permission from teachers, etc., may effect selection procedures. Therefore, this application does not insure placement. We will however, inform all applicants of any decision, as soon as possible.
Figure 5. Student staff evaluation form to be completed weekly by center manager.
GUIDED STUDY PROJECT
Student Staff Review

Student Staff Name: _________________________


1. On time
2. Explained GSP to new students
3. Correctly fills out contract
4. Periodically checked on students
5. Assisted students with classwork
6. Reinforces working
7. Reminds students not to disturb others
8. Completes Student Review Form
9. Feedback: Reinforces students completing contract
10. Took care of student forms and GSP materials before leaving
11. Willingness to work with all students

Comments:

Student Staff Review completed by: _________________________

Week of: _________________________
### Table 1

**CENTER MANAGER AND STUDENT STAFF RESPONSIBILITIES**

<table>
<thead>
<tr>
<th>CENTER MANAGER</th>
<th>STUDENT STAFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Be able to perform all student staff duties.</td>
<td>1. Conduct oneself in a professional manner at all times, including courtesy,</td>
</tr>
<tr>
<td>2. Be present in the Guided Study Center during operation.</td>
<td>respect, confidentiality and politeness in interactions with others.</td>
</tr>
<tr>
<td>3. Provide student staff with all materials needed to operate the center.</td>
<td>2. Complete the contract form, in duplicate, with the student participant so</td>
</tr>
<tr>
<td>4. Provide for: a. initial training of staff, b. daily monitoring of staff,</td>
<td>that task and criterion are described in observable and measurable terms.</td>
</tr>
<tr>
<td>c. the use of modeling, prompting, feedback and/or social reinforcement of</td>
<td>3. Periodically check (at least twice during the study time) the participant's</td>
</tr>
<tr>
<td>student staff behaviors, and d. weekly meetings with staff to review</td>
<td>progress, acknowledge and reinforce good behavior and praise work done</td>
</tr>
<tr>
<td>performance.</td>
<td>correctly.</td>
</tr>
<tr>
<td>5. Complete all data summary forms so that the Guided Study Project can be</td>
<td>4. Complete the Student Review Form at the end of the study period and give</td>
</tr>
<tr>
<td>evaluated.</td>
<td>feedback to the student participant.</td>
</tr>
<tr>
<td>6. Ensure that center procedures follow school policies as indicated by</td>
<td>5. Assist those individuals who ask for help with tasks.</td>
</tr>
<tr>
<td>teachers and by administrators.</td>
<td>6. Answer any questions concerning Guided Study procedures or refer</td>
</tr>
<tr>
<td>7. Be responsible for the actions of student staff and student participants</td>
<td>questions to the center manager.</td>
</tr>
<tr>
<td>and assist student staff in answering questions, resolving conflicts, and</td>
<td>7. Remind student participants who are disturbing others of appropriate</td>
</tr>
<tr>
<td>enforcing the GSP management program.</td>
<td>behavior.</td>
</tr>
<tr>
<td>8. Provide additional educational activity for student staff when time</td>
<td></td>
</tr>
<tr>
<td>permits.</td>
<td></td>
</tr>
</tbody>
</table>
In order to illustrate a typical sequence of center use, the specific steps are listed below.

1. Student obtains permission to use GSC from a teacher or the study-hall supervisor.

2. The student brings the pass to the GSC and signs in.

3. A contract is negotiated and the form is filled in by a student staff member.

4. Assistance is given on request or as a function of apparent difficulty during the work period.

5. The work is reviewed and marked complete or incomplete by staff member. This is done when the allotted time expires or a student indicates that he/she is finished with the described task.

6. The Student Review Form is completed and discussed briefly with the participant.

7. The student participant is given a copy of the contract and is asked to return to the classroom before the end of the hour in which he/she came to the center.

General data are collected routinely by the center manager. The number of students attending by hour, the subject area of each contract, the name of the referring teacher, the results of contract work (complete or incomplete) and the Review Form results are all recorded daily. The contract completion rate is summarized on a
weekly basis.

The center is open seven hours per day, five days per week. A contract is written for no more than one hour and no less than fifteen minutes. The capacity of the center is approximately fifteen students per hour.

**The Guided Study Project Contract**

The contract form used in the Guided Study Center is not a typical contingency contract. First, the GSP contract is written for less than one hour while many times contracts are written for days or weeks. Second, the task description and criterion sections on the GSP form are brief and the information pertains to a very specific assignment; sometimes only one math problem or study question is included. Third, and perhaps most importantly, the statement of consequences for work completed is nonspecific. A student is simply told that if he/she works quietly, the use of the center will be allowed in the future. The implication (not stated explicitly) is that the student will not be allowed to return to the center if he/she does not work quietly and have work reviewed before leaving. Although the classroom teacher who sanctions the use of the center may apply consequences (e.g. grades) contingent on work completion, no such conditions are in effect in the GSC.
No effort is made to state teacher-controlled consequences in the contract.

Some other implicit factors may have an effect on the work done in the GSC. The task is described in very specific terms and only a small amount of work is done on one contract. If the student has been reinforced in the past for following specific instructions, the specificity of these components may increase the probability of contract completion. Secondly, all contract work is done in the center environment as opposed to home (Bristol and Sloane, 1974) or classroom (Homme et al., 1969). An adult and the student staff members (who sign the contract) are both present and frequently assess performance.

Therefore, consequences in the form of knowledge of results and social approval/disapproval probably affect completion rate to some extent. Furthermore, the complete/incomplete designation on the contract form is likely to be observed by the classroom teacher and/or others, as the student's hall pass is included on the form. A complete contract may result in approval from these persons and perhaps other tangible consequences (e.g. grades, free time, etc.) awarded at the discretion of the teacher.

Finally, the GSC environment may increase the
chances of contract completion in an additional way. In the absence of a history of reinforcement for responding independently, early contracts may be controlled by the audience. Based on Skinner's (1957) analysis of verbal behavior, we know that an audience (listener) may affect the probability of a given response by a speaker. Furthermore, Skinner pointed out that environments may serve as audiences. We are quiet in a theatre because of past experience there. Or we may avoid certain verbal responses in a church, but emit these responses frequently in a bar as a result of past consequences received or observed. The GSC may increase the probability of study behavior and decrease the likelihood that other behaviors will be reinforced. If a sufficient work history can be established by environmental control, students may come in contact with other naturally occurring consequences of work completion (e.g. approval, grades, etc.).
CHAPTER III

GUIDED STUDY CENTER USAGE DATA

The center was opened approximately one month after school began and remained open throughout the school year. The center was available to students seven hours per day. A presentation was given at a teacher's meeting to introduce the project. Printed instructions on GSC use were distributed to teachers and staff were asked to present the procedures to students in their classes. Posters announcing the opening of the center were displayed throughout the building. Since the project had been operated on a limited basis the previous year, most teachers and students were familiar with the center.

Figure 6 presents the number of complete and incomplete contracts per week for the duration of the school year. Participation began at a relatively low rate (50 contracts per week) and quickly increased (over 100 contracts per week). Thereafter, the contract rate varied with six-week grading periods. Usage of the GSC appeared to peak during the fifth week of each grading period and then decrease. Rates were also depressed near holidays and the semester change period. The contract completion rate was stable and high throughout the year.
Figure 6. The number of complete and incomplete daily contracts per week for one year of operation.
The proportion of contracts completed did not appear to vary consistently with the number of contracts written. Table 2 presents the percentage of contracts completed by week. The proportion of completed tasks ranged from 80% to 100% and was above 90% for most weeks.

Figure 6 presents usage in terms of number of contracts and not number of students. A student could write more than one contract per week or per day. Approximately two thirds of the students in the high school (175) used the center at least once. Figure 7 displays the percentage of students who contracted once and more than once during one semester. Most often students wrote two to five contracts; a substantial number came only once and did not return.

Most student participants were freshmen (grade 9) while a decrease in usage was noted as grade level increased (Figure 8). Most students who used the GSC were of the medium grade-point-average range; participants who had high and low grade point averages contracted in approximately equal numbers (Figure 9). Students of the medium GPA category wrote more contracts than students of either the high or low GPA categories (see Figure 10). Students of the low GPA category accounted for the smallest proportion of contracts written by the three performance levels.
<table>
<thead>
<tr>
<th>Week</th>
<th>Percent Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>86</td>
</tr>
<tr>
<td>2</td>
<td>87</td>
</tr>
<tr>
<td>3</td>
<td>93</td>
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<tr>
<td>4</td>
<td>91</td>
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<td>5</td>
<td>95</td>
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<td>6</td>
<td>90</td>
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<td>7</td>
<td>90</td>
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<td>8</td>
<td>96</td>
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<td>93</td>
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<td>10</td>
<td>92</td>
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<td>16</td>
<td>100</td>
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<td>85</td>
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<td>29</td>
<td>91</td>
</tr>
<tr>
<td>30</td>
<td>93</td>
</tr>
<tr>
<td>31</td>
<td>82</td>
</tr>
<tr>
<td>32</td>
<td>90</td>
</tr>
</tbody>
</table>
Figure 7. Percent of students who wrote contracts in the GSC who contracted once and more than once during one semester (N = 120).
Figure 8. The number of students who wrote contracts in the GSC by grade level for one semester of operation.
Figure 9. Number of students who wrote contracts in the GSC by semester grade point average categories (GPA) where low = 0.5 – 1.9, medium (med) = 2.0 – 2.9, and high = 3.0 – 4.0 on a 4.0 scale.
Figure 10. Percent of contracts written in one semester by students of low (0.5 - 1.9), medium (2.0 - 2.9) and high (3.0 - 4.0) grade point averages (G.P.A.) based on one semester's grades.
Table 3 indicates that most contracts were written by students who sought assistance for math classes. English and history students accounted for equal numbers of contracts; the remaining subject areas evidenced considerably lower rates of participation. Thus, required courses which involved basic skills, accounted for the majority of usage.

Table 4 summarizes the percentage of participants who met the behavior-management requirements of the center. The percentage of contract episodes in which compliance was observed (i.e. a "yes" checked) is presented for each behavior-management objective listed on the Review Form (refer to Figure 2). The objectives which describe routine GSC procedures were met by a large proportion of contractees. (s 1, 2, 3, 4, and 7). Objectives five and six describe appropriate social behavior and were met less often than procedural objectives (88% and 92% respectively).

In order to determine if behavior management data were reliably recorded, an independent observer completed a Review Form on a sample of students on several different occasions. Reliability measures were taken for one-half day every two weeks. Reliability coefficients were calculated according to the following formula:
Table 3
Proportion of Contracts Written by Subject Area for One School Year

<table>
<thead>
<tr>
<th>SUBJECT AREAS</th>
<th>STATISTIC</th>
<th>MATH</th>
<th>ENGLISH</th>
<th>HISTORY</th>
<th>HOME ECONOMICS</th>
<th>PHYSICAL SCIENCE</th>
<th>BIOLOGICAL SCIENCE</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Contracts</td>
<td>(N = 2,082)</td>
<td>1021</td>
<td>338</td>
<td>323</td>
<td>189</td>
<td>100</td>
<td>98</td>
<td>13</td>
</tr>
<tr>
<td>Percentage of Total</td>
<td></td>
<td>49</td>
<td>16</td>
<td>16</td>
<td>9</td>
<td>4.8</td>
<td>4.7</td>
<td>.5</td>
</tr>
</tbody>
</table>
### Table 4

Percentage of Students Participants Who Met Guided Study Review Form Objectives  
(Based on a Sample of 200 Forms)

<table>
<thead>
<tr>
<th>Objective</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Obtained a pass and had it signed by teacher</td>
<td>100%</td>
</tr>
<tr>
<td>2. Completed a contract form and had it signed by staff</td>
<td>99%</td>
</tr>
<tr>
<td>3. Arrived at the center on time from class</td>
<td>98%</td>
</tr>
<tr>
<td>4. Began working within four minutes of filling out a contract</td>
<td>99%</td>
</tr>
<tr>
<td>5. Remained on task 90% of the time</td>
<td>88%</td>
</tr>
<tr>
<td>6. Refrained from disturbing others</td>
<td>92%</td>
</tr>
<tr>
<td>7. Obtained feedback on contract and review form before leaving</td>
<td>100%</td>
</tr>
</tbody>
</table>
Number of Agreements
Number of Agreements + Number of Disagreements x 100

Number of agreements consisted of the total number of items reviewed for all forms completed for the session when both observers checked "yes" or both checked "no". A disagreement was evidenced when one observer checked "yes" on an item and the second observer checked "no" or vice versa. All agreements and disagreements for all items checked in a session were combined for the calculations. The times of the reliability checks were varied so that all student staff and all center managers were involved at least once. Reliability coefficients ranged from 96% to 100% and averaged 98%. A total of twelve reliability checks were done.

A sample of contracts was reviewed to determine the accuracy of staff in completing the forms. Twenty contracts were randomly selected from the files of each month of operation. Thus, a total of 160 contracts were reviewed. Figure 11 presents the results of this process in terms of percent accuracy by contract sections. All sections were accurately completed for a large majority of contracts. Problems were most frequently noted with criterion statements. Inaccuracy of criterion was most commonly evidenced as unobservable behavior. For example, a criterion might be incorrectly stated as "read
Figure 11. Percent accuracy of contract sections as completed by GSC student staff for a sample of 20 contracts per month of operation (total contracts reviewed = 160).
ten pages"; a behavior which could not be reliably observed. In order to insure that evaluations of accuracy were reliable, an independent observer trained to assess the adequacy of contracts reviewed 50% of the contracts sampled. A reliability coefficient was calculated by the following formula:

\[
\text{Number of Agreements} \times 100 \\
\text{Number of Disagreements and Number of Agreements} \times 100
\]

An agreement referred to a judgment of accuracy or inaccuracy by both observers on a contract section. The reliability coefficient indicated that judgments of accuracy coincided on 97% of the contract sections reviewed.

The data described above indicate that the GSC was used consistently by students and teachers. Furthermore, the center procedures were shown to be effective in facilitating task completion. However, in order to be useful in functional terms, it must be demonstrated that the use of the GSC has some effect on classroom performance (i.e. increases grades). The empirical investigations that follow were designed to evaluate the GSC in terms of student behavior change and assess the value of selected variables for contracting research in general.
CHAPTER IV

EXPERIMENT I

Clinical applications of contracting emphasize the importance of maintaining behavior change in natural environments (e.g. Tighe and Elliot, 1968). The ultimate goal of the intervention can be characterized as the production of adaptive behavior independent of a contract and outside the controlled circumstances under which the contract was originally written (e.g. therapist's office). Numerous authors have measured the long-term behavioral effects of contracting (Wysocki, Hall, Iwata and Riordan, 1979; Patterson and Hops, 1972; Harris and Bruner, 1971). Varying degrees of success have been reported.

Educational contracting has been used successfully to improve academic performance in classroom programs (e.g. Williams and Anandam, 1974) and with individual low performers (Brigham and Amith, 1973). However, no data on the generality of performance effects have been reported when academic behavior was targeted. Typically, results are expressed in terms of direct effects and do not include measures of changes in behavior outside the immediate research environment. If contracting is to be...
used to train self-management skills, as Homme, et. al., (1969) have suggested, the behavior of interest occurs after contracts have been discontinued or in similar environments where contracts are not used.

The use of a school-wide contracting center necessitates that students receive assistance in one environment (i.e. Guided Study Center) and perform appropriately in a second environment (i.e. a specific classroom). The time available during school hours for use of a contract center is probably not sufficient to complete all of the work necessary for an adequate evaluation. Therefore, a large portion of assigned work must be done elsewhere and in a setting where contracts are not used. Thus, an overall improvement in classroom performance when contracts are used outside the classroom would reflect the direct effects of the intervention (i.e. grade received on the work specified in the contract) as well as the generality of effects (i.e. grade received on the work not included in any contract).

On the basis of the above analysis, a general improvement in classroom performance as a function of contract-center use, would indicate that some self-management skills were learned. This prediction is consistent with Skinner's (1969) contention that,

"The behavior of a person who has calculated
his chances, compared the alternatives, or considered the consequences of a move is different from, and usually more efficient than, the behavior of one who has merely been exposed to the nonanalyzed contingencies." (P. 122)

It may be that the use of the Guided Study Center (GSC) provides the student with the experience of task analysis and provides a model of effective use of study time which are subsequently applied to other tasks.

Two types of research studies were designed to test the effects of GSC use on evaluations of classroom performance. Experiment IA involved a comparison of mean six-week grades earned by a GSC group with those earned by a control group. Experiment IB employed a multiple baseline design to test the effects of GSC use on grades earned across individual students.
Experiment IA

Method

Subjects. Students were selected from a high school population (grades 9-12) and were primarily low and average performers (i.e. grade point averages of .5 to 2.5 on a 4.0 scale).

Design. A group design was used to compare the six-week grades of Guided Study Center participants (experimental condition) with nonparticipants (control condition). Subjects were selected from three different classrooms. School policy dictated that all students in a classroom must be given access to services at the same time; therefore random assignment of students within a classroom to conditions was not possible. All students were given the opportunity to attend the GSC by teachers. Students who attended once were divided into two matched groups (control and experimental). Experimental subjects were encouraged to maintain GSC use via verbal instructions, control subjects received no instructions. The groups were matched on the basis of six-week grade previous to the intervention period, grade level (i.e. freshman, sophomore, junior, senior) and classroom/subject area. For a discussion of the matched-groups design, see Underwood, (1966).
Procedures. Three classroom teachers were instructed to provide students with a short description of the Guided Study Project and to provide the entire class the opportunity to use the GSC during independent study periods. The teachers were selected because of their previous interest in using the GSC (i.e. based on referral rates for a previous time period).

Student use of the center from the three classes was monitored via attendance data. Students who used the center once were considered part of the subject pool and the groups were formed only from these participants. Twenty-five subjects were randomly selected from the subject pool to form the experimental group. The classroom from which each student came, the grade for the six-week period immediately prior to the study and the grade level of each student were recorded. From the remaining subjects in the pool, students were selected for a control group. Matching was done on subject-by-subject basis on the three variables just described. Thus, if an experimental group subject came from math, was a freshman and had obtained a grade of "E" for the six-weeks prior to the study, a control subject with those characteristics was selected from the pool and a matched pair was formed. This process was continued until a control group of twenty-five subjects was formed.
Since the grades within classes were homogenous and the grade level was relatively constant within a class, the matching procedure provided no difficulties. If more than one student from the subject pool "matched" an experimental subject both were included in the control group.

After the matching procedure was completed, subjects were exposed to differential experimental conditions. Experimental group subjects were encouraged to maintain their use of the GSC and were given the following instructions (or a paraphrased version) by the experimenter at least once per week during the study.

"You can ask your teacher to use the GSC anytime you want. She/he has given permission for you to come from class if you wish. You may also come from study hall. Just ask for a pass and come to the center. Be sure to bring books, papers or whatever you need to work on. I think using the GSC will improve your grades if you come often enough. If you have any problems let me know."

Control subjects were not contacted and were left to use the center as they chose. In order to remain part of the study, an experimental subject was required to attend ten times during the six-week grading period. If a control subject exceeded three visits during the period he/she was removed from the study. If one subject was withdrawn, the "matched" subject(s) from the second group was not included in the data analysis.
When subjects came to the GSC, they participated in the standardized procedures described earlier. No attempt was made to arrange for classroom consequences based on contract completion and no intervention within any of the selected classrooms was undertaken.

**Performance Measure.** Six-week letter grades were obtained from the report cards of subjects for the six-weeks prior to the study and for the period of the study. Letter grades were converted to grade points for purposes of analysis. A letter grade of E = 0.0, D = 1.0, C = 2.0, B = 3.0 and A = 4.0.

**Results**

Nineteen subject pairs met the criterion necessary to be included in the analysis. Six pairs were dropped because of variation in attendance rates. Mean grades for the GSP group and a control group were compared using a t test of significance. Subjects in the two groups were matched; therefore, a correlated t test was used rather than a t test for independent samples.

Figure A-1 presents the mean six-week grades prior to and during the comparison period for both groups. Equivalence at the pretest point was achieved by matching. Both group mean grades increased during the comparison or posttest period. However, the GSP group
Figure A-1. Mean grade point average (GPA) per marking period for Guided Study participants (solid line) and control subjects (broken line) prior to and following guided study usage.
mean increased more than the control group mean. The difference at posttesting was statistically significant \((t = 2.141, df = 18, p = .0462)\) indicating that the greater degree of improvement by the GSP group was too large to be attributed to chance.

A secondary analysis was performed by dividing the groups into "high" and "low" performers. High performers were defined as students with a grade of C or above (2.0 to 4.0 on a 4.0 scale) for the six-week period prior to the comparison period. Low performers were defined as students who earned a D or E (1.0 or 0.0 on a 4.0 scale) for the pretest period. This division was done for both the GSP group and the control group. The GSP and control lower performers were compared in terms of mean grades earned during the comparison period. Since this analysis was not planned apriori the number of subjects in each group was too small for statistical analysis. However, graphic display of the data is informative. The mean grades for low performers are presented in Figure A-2. The same pattern as was observed in the overall analysis (Figure A-1) is evident, except that the difference between groups at the posttest point is larger than that seen in the overall comparison.

Mean grades of GSP high performers were also compared with grades of control high performers. The
Figure A-2. Mean grade point average (GPA) for Guided Study participants (solid line) and control subjects (broken line) for marking periods prior to and following GSC usage. The data presented are for low performers only.
difference between these groups was small. The two
groups increased performance over the two periods shown
in Figure A-3; however both groups increased
approximately the same average amount.

It appears that much of the significant difference
observed in the overall analysis can be accounted for by
improvement in the grades of low performers. This result
agrees with the contention of Bristol and Sloane (1974)
that low performers benefit more from contracting
programs than students of other performance levels. It
might be argued that high performers were limited in the
amount of improvement possible because they were already
near the "ceiling". This argument does not apply in the
current study because all students in the high-performer
groups were at the C (2.0) or B (3.0) level and only one
of seven subjects earned an "A" (4.0) or ceiling grade
during the comparison period.
Figure A-3. Mean grade point average (GPA) per marking period for Guided Study participants (solid line) and control subjects (broken line) prior to and following guided study usage. The data presented are for high performers only.
Experiment IB

Method

In order to examine individual performance patterns as a function of GSC use, a second experiment was designed using a single-subject analysis.

Subjects. A total of nine subjects (grades 9-12) were selected; three students from each of three different classrooms. Students must have used the GSC at least twice prior to the study. The criterion for prior usage was used to insure that the students were familiar with center procedures and thus, more likely to continue to participate throughout the study. All students were of the low to average performance range.

Design. A multiple baseline design was applied across subjects and classrooms. All grades assigned each week were averaged for each student to obtain a measure of weekly performance during baseline and intervention. All grades were recorded from teacher record books. During baseline, students simply used the GSC as they chose and were exposed to teacher-provided opportunities as were their classmates. At the beginning of the contract condition, students were asked to increase their use of the center by being given the following instructions (or a paraphrased version) by the
experimenter. The instructions were repeated at least once per week.

"In looking over the attendance I see that you have used the GSC a few times. We can help you improve your grades if you use the center more often. Your teacher has given permission for you to use the center anytime you wish to. All you have to do is get a pass and bring it with you. Be sure to bring books, papers or whatever you need to work on. Just remember if you really want to improve your grades you should come to the center as often as possible. If you have any problems, let me know."

Procedures. As with Experiment IA, all teachers were asked to provide the opportunity to use the GSC to all students. Baseline measures were taken on all students from the three target classes initially. However, many students chose to maintain a high level of usage preventing their use as subjects in the study. Students who did not maintain usage after initial contact thus formed the subject pool. Grades were obtained from teacher record books on a weekly basis and averaged to determine performance levels. Teachers were not told the names of experimental subjects and since many students used the GSC, target subjects probably remained unidentified. Similarly, the identity of subjects was unknown to center staff as was the order of experimental conditions. All student subjects were reminded at least once per week to continue their use of the center. Occasionally teachers were asked to encourage GSC users
to maintain their participation. No classroom reinforcement programs were systematically arranged to encourage participation for any of the subjects. When students came to the center, they participated in the standardized contracting procedures described earlier.

Results

Of the nine subjects selected, only five completed the study. The results are presented in Figure A-4. The reasons for the loss of subjects are not known.

All subjects who completed the study evidenced improvement in average weekly grades when the GSC was used. The mean change in grades ranged from eight percent (S1) to 21 percent (S2). The baseline measures for S2 were highly variable and thus the mean change observed was probably not representative of typical performance. However, as is many times the case in the schools, it was necessary to intervene without a stable rate in order to prevent failure. The reasons for the sudden drop in performance could not be determined. It does not appear that assignment difficulty was a major factor, as S1 (from the same class) did not show a similar change in performance at that time.

Subject 3 began to use the GSC after instructions were given, however usage was sporadic during the first
Figure A-4. Mean weekly grades in percent as a function of weeks for no contracts (BS'LN) and Guided Study Center use conditions. The number of contracts completed each week is noted at the bottom of the graph and mean contracts completed per week for each condition is denoted by X.
part of intervention. Subsequently, consistent use of the center was evidenced and performance improved. The letter "N" displayed on the figure indicates no activity for the week designated. The class from which S3 attended was self-paced and thus the work done in any week was based on the student's decision. When the GSC was used consistently, the work rate increased relative to baseline and as compared to the period of inconsistent usage.

Subject 5 used the GSC for only five weeks during intervention and then stopped coming to the center. These data provide an unplanned reversal. The reduction in usage appeared to produce a performance decrement. However, as the student chose to discontinue use of the GSC, other factors could have caused the observed change in grades.

The number of daily contracts completed during intervention varied across subjects. S2 completed only an average of 1.4 contracts per week during intervention, while S3 completed 3.4 contracts per week. The number of contracts completed per week appeared to related systematically with the average weekly grade. When all weekly scores were averaged according to number of contracts completed, an increasing functional relationship was observed (see Figure A-5).
Figure A-5. Mean weekly performance for five subjects as function of number of contracts completed per week.
No systematic differences were observed as a function of subject matter studied. S1 and S2 were history students; S3 contracted for math assignments; while S4 and S5 used the GSC for English assignments.
CHAPTER V
EXPERIMENT II

Introduction

Homme et. al. (1969) pointed out that the ultimate goal of contingency contracting is self-managed performance. These authors described a number of transitional steps from teacher-controlled to student-controlled contracts. In the former case, the teacher chooses both the consequences and the behavior to be performed; the student agrees or disagrees with the conditions but does not negotiate changes. In the case of a student-controlled contract, the student completes all sections of the document and the teacher must approve or disapprove the content. The transition steps between the two extremes are designed to allow the student to gradually learn to assume complete control of a contract task.

Although Homme et. al. provided no data in support of the above hypothesis, other researchers have shown student participation to be important to academic success. Lovitt and Curtiss (1969) demonstrated that a student performed better when he was allowed to choose...
his own consequences for work done, than when he had consequences imposed on him by the teacher. Similarly, Karraker (1977) found that students performed better when they selected their own reinforcers in a token economy than when reinforcers were specified by the teacher. Ratings of the class were also more positive when the self-select condition was applied. Arwood, Williams and Long (1974) compared student performance when a contract was used with performance based on a behavior proclamation. The contract condition provided for student participation in the specification of behavior to be performed and consequences to be earned. The proclamation condition included the same behaviors and consequences but students were not allowed to participate in their selection. Although the requirements of both conditions were approximately the same, students performed better when the contract was used. The authors concluded that the level of student involvement was a significant variable in academic success.

Felixbrod and O'Leary (1973) did not confirm the superiority of performance under self-determined conditions. In a yoked-control design one group of students was allowed to choose their own performance standards; a second group was exposed to the same standards without a choice. A third group received no
reinforcement for performance. The self-determined group performed better than the no-reinforcement group. However, the self-determined and no-choice yoked groups did not differ. These results confirmed the findings of Bandura and Perloff (1967) where no difference in performance was observed between self- and externally-imposed standards and consequences.

The above studies present conflicting evidence. However based on this research the effects of student participation can be assumed to have no detrimental effects on performance. Even if performance is not improved by self-determined tasks and consequences, increased student participation is important for other reasons. If the student can be allowed to manage his/her own learning conditions, without a decrease in performance, then effective self-management skills may be facilitated by fading the teacher's involvement.

The Guided Study procedures were shown to be effective in improving student classroom performance in Experiment I. However, these results were obtained under highly structured conditions. If the student must eventually perform in the absence of contracting, a necessary step would involve a decrease in support by center staff. If support can be faded without producing a corresponding decrease in classroom grades, a
successful step toward self management can be achieved. Thus, Experiment II was designed to determine the effects of an increase in student involvement in the choice of contract conditions on classroom grades.
Method

Subjects. A total of four subjects (grades 9-12) were selected from two different classrooms. Each subject must have completed at least two contracts per week for four weeks prior to intervention. Therefore, only students with a history of consistent GSC usage were selected. The four subjects were all sophomores (grade 10) and enrolled in either Algebra or General Mathematics classes.

Design. A multiple baseline design was applied across subjects and classrooms. Baseline included measures of performance while students used the standard GSC procedures (as described previously). Intervention was applied by instructing students to write their own contracts and to have them signed by staff. Each student was given the following instructions (or a paraphrased version) at least once per week.

"You have been coming to the GSC for awhile now. You are familiar with the contract and you know the rules. So, now we want you to fill out your own contract when you come to the center. Just come in and pick up a contract form and fill in the time, description and criterion sections and have it signed. Do your work as usual. Do this everyday from now on. When you finish have your work checked before you leave."

Average weekly grades were computed from teacher record books. The number of contracts completed and the quality
of contracts written were also recorded. Quality was evaluated by examining 20 percent of the contracts written before and after intervention. In order to be accurate, time, task/description and criterion sections must have been completed and a signature affixed. Additionally, the criterion must have been written in terms of an observable product (e.g. number of problems correctly calculated, number of questions answered, etc.).

Procedures. The self-contract intervention involved a change in procedures for students already attending the GSC. Therefore, teachers were not told of the change in procedures. Staff members were told that some students would fill out their own contracts in order to save time. Staff members were asked to sign and evaluate the contracts as usual. However, staff were told not to change the content of the contracts and to leave them in the form as written by student participants. If a portion of the contract was left blank students were asked to complete it before it was signed.

Students who met the criterion for attendance during baseline were asked to write their contracts as described above. The contracts were reviewed daily to insure that the instructions were followed. If it was determined that a contract had been written by staff, the
instructions were repeated to subjects and staff were again asked to allow students to write their own contracts.
Results

Three of four subjects continued contracting through the intervention phase of the study. The number of contracts completed during baseline (standard GSC procedures) and the student-written contracting conditions did not differ appreciably for any subject. S1 completed an average of 2.25 contracts per week during baseline and 2.6 contracts during student contracting; S-2 completed 2.4 and 2.0 contracts during the two conditions; and S-3 completed an average of 2.2 and 2.0 contracts across the experimental phases.

The intervention involved a change in contract writing procedures. Thus, an analysis of the accuracy of contracts written by section was done to determine if students adequately completed the forms without staff assistance. Figure B-1 presents the results of this analysis. Fifty percent of all contracts written during the study were examined. The task description and criterion sections were completed accurately by both staff and student participants. However, student-written contracts were less likely to have the time needed to complete work filled in and less likely to be signed by staff. These differences did not appear to affect the probability of success as the percentage of contracts
Figure B-1. Percent accuracy of contract sections as a function of staff-written and student written contracts for a 50 percent sample of contracts.
completed was slightly higher during the student-written contract condition.

Figure B-2 shows the results of the multiple baseline study. The weekly performance of S1 and S2 varied slightly across conditions. However, the differences observed were no larger than what might be expected as a result of slight variations in the number of contracts completed. The performance of S3 appeared to decrease during the student-written contract condition, however, during the second week of intervention S3 had to be asked to leave the center because of inappropriate behavior. He was not allowed to return until a conference was held with the school principal. Subsequently, staff reported him to be less cooperative than before the disciplinary action. It is possible that this incident could have artificially suppressed performance.

In general the data of Figure B-2 indicate that classroom performance was not differentially affected when students were permitted to write their own contracts. Therefore, it appears that this step toward self-management can be taken without detrimentally affecting performance.
Figure B-2. Mean weekly classroom grades in percent as a function of peer-negotiated (GSC only) and student-written contracts. The number of contracts completed per week is noted at the bottom of the graph and mean contracts completed per week (X) for each condition is presented. *Represents the week that S3 was removed from the center.
EXPERIMENT III

Introduction

As emphasized previously, the Guided Study Center is designed to augment and support group instruction. Experiment I demonstrated that the GSC procedures improve the classroom performance of student participants. Experiment II showed that performance was not detrimentally affected when students were allowed to write their own contracts under structured conditions. However, according to Homme, et. al. (1969), individualized instruction is not the only goal of contracting. Ideally the student should learn to manage his/her own behavior without extensive support.

The performance measures presented in previous experiments were based on contracts written in the GSC. If the contrived support of the center is to be withdrawn eventually, the student must perform well in response to common classroom stimuli. Thus, stimulus control must be transferred from the GSC staff to the teacher. If the center procedures are effective in training students to manage their own behavior outside the GSC, no performance
Figure C-1. The Teacher-Student Negotiated Contract Form
DAILY CONTRACT FOR GUIDED STUDY

NAME ___________________________ DATE ___________________________

TEACHER ___________________________ CLASS HOUR ___________________________

T I M E S

From Arrive Leave Arrive

Class GSP GSP Class

T A S K:

ASSIGNMENT CRITERIA TIME TO COMPLETE

(WHAT KIND OF WORK) (HOW MUCH WORK) COMPLETE (YES OR NO)

1

2

3

I AGREE TO THE ABOVE TASKS AND TIME AND WILL DO THE AMOUNT OF WORK LISTED. I ALSO UNDERSTAND THAT IF I WORK QUIETLY IN THE GUIDED STUDY CENTER AND HAVE MY WORK REVIEWED AT THE END OF THE PERIOD, THAT I CAN CONTINUE TO USE THE CENTER.

TEACHER SIGNATURE ___________________________
Student Signature ___________________________
Student Staff ___________________________

Figure C-1 The Teacher-Student Negotiated Contract Form
decrement should occur with the transfer of control.

Tharp and Wetzel (1969) discussed a model whereby a mediator from the natural environment of a target subject controlled variables identified as important to adaptive behavior. The mediator is trained to intervene with clients by a consultant. Once the mediator becomes effective in carrying out the intervention, the consultant may withdraw without negative effects. The services of the GSC may be viewed as a training program for students and for teachers. Students are trained directly to specify tasks and criterion and to make efficient use of study time. The center may also serve to train teachers much as a consultant trains mediators to maintain selected behaviors of a client in the natural environment. Teachers are provided with a model of contracting via center use by their students. However, additional training may make it possible to return the control of task specification and consequences to the classroom.

Thus, experiment III was designed to determine if the GSC contract could be negotiated between student and teacher without detrimentally affecting performance exhibited under standard GSC procedures.
Method

Subjects. Six subjects were selected from students who consistently used the GSC. The subjects were selected from two different classes. Three from a math class and three from an English class. Three subjects were freshmen (grade 9) and three were sophomores (grade 10). All students evidenced average to high levels of performance prior to the study. Teachers selected had a history of referral rates in the GSC and agreed to write contracts in class.

Design. A multiple baseline design across classrooms was used. Since teachers were required by school policy to make the same procedures available to all students within a class at the same time, the multiple baseline could not be applied across subjects within a classroom. Baseline consisted of performance measures taken while students used the standard GSC procedures. Intervention (teacher-contracting) included performance measures obtained while teachers negotiated the contracts with students prior to students coming to the GSC to do the work. Average weekly performance was computed from teacher record books. A sample of contracts was examined to evaluate the accuracy of document completion. The number of contracts completed
prior to and during intervention was also recorded.

**Procedures.** Teachers were instructed by the experimenter in contract-writing procedures in one face-to-face session. Two forms were completed by each teacher on the basis of a role play by the experimenter. The contract form was altered slightly to accommodate the change in procedures (see Figure C-1). Teachers were asked to provide students with the opportunity to come to the GSC as usual. However, when intervention was begun, teachers were asked to complete a contract with each student and sign the agreement before sending participants to the center. Students were instructed to bring the contract with them to the center. Each student was asked to sign in as usual, and to show his/her contract to GSC staff. Staff members were asked to sign the form in the space provided and to record the contract information on a data summary form. Students were asked to follow contract instructions and complete their work. When time expired or the student indicated that the work was finished, the work product was checked and designated either complete or incomplete by GSC staff. The only change in procedures involved the negotiation of the contract between student and teacher in the classroom. Students were instructed to return to class with the contract and give the form to the teacher. Teachers were
asked to save the forms for record keeping purposes. A GSC staff member picked up the contracts daily and asked if any problems had occurred with the procedures. Staff were instructed not to change the terms of the contract unless it could not be determined what task was to be done. In this case, students were asked to return to class to more thoroughly complete the agreement.
Results

The mean number of contracts completed during baseline (GSC ONLY) and intervention (TEACHER CONTRACTS) phases was approximately equal for all subjects. S1 completed an average of 2.8 contracts per week during baseline and 3.2 contracts during intervention; S2 completed 2.5 and 2.1 contracts during the two conditions; S3 completed 2.0 and 2.2 contracts; and S4 completed an average of 2.0 and 2.4 contracts across the experimental phases.

The intervention involved a change in contract writing procedures. Thus, an analysis of the accuracy of contracts written by section was done to determine if teachers adequately completed the forms. Figure C-2 presents the results of this analysis. Fifty percent of all contracts completed during intervention were examined. Since the teacher-contract forms differed from GSC forms, no comparison of contract accuracy from baseline to intervention was done. Both time and signature sections were completed accurately in 90 percent of the forms examined. The description and criterion sections were accurately done less often. However, the contract task completion rate was not detrimentally affected (95%).
Figure C-2. Percent accuracy of contracts written by teachers and students for five contract sections. Based on a 50 percent sample of contracts.
Figure C-3 presents the results of the multiple baseline study. The changes in average weekly performance were small for all subjects when teacher written contracts were introduced. S1 and S2 showed equivalent patterns of performance across conditions both in terms of accuracy of work and variability. Both subjects were enrolled in a self-paced math course and were allowed to determine when quizzes were to be taken (within limits set by the teacher). The broken lines during intervention indicate a period of inactivity due to early completion of course units and semester exams.

Subjects 3 and 4 did not show large changes in accuracy across conditions. However the variability of performance appeared to decrease during intervention. This may have resulted from the teacher's participation in that assignments to be done were written into a contract well before the due date. GSC staff were dependent on the student's selection of assignment. Occasionally staff reported that students would contract to do work only a short time before the due date. Thus, participants who used the GSC negotiation might perform poorly because an assignment was handed in late and/or because the time available was not sufficient to produce a quality product.

In general, the data indicate that teachers were
Figure C-3. Mean weekly grades per week for four students for GSC contract (peer-negotiated) and teacher-written contracts. The number of contracts completed per week is noted at the bottom of the figure and mean contracts completed per week for each condition is denoted by X.
able to write contracts with students and allow the
students to complete the work in the GSC without
producing a decrease in performance as compared to use of
the GSC only. Therefore, it appears that the teacher can
effectively monitor the learning activities of students
with a history of contract use and that the transfer of
stimulus control from GSC staff to teacher does not
produce performance decrements.
CHAPTER VII

GENERAL DISCUSSION

The usage results indicated that a large number of students participated in the program and that the rate of productivity in the center was consistently high. Students also followed the procedures necessary for effective use of the center. Experiment I demonstrated that the completion of contracts in the center resulted in improved classroom performance. Experiments II and III showed that performance was not detrimentally affected when students wrote their own contracts or when teachers and students negotiated contracts in the classroom.

These results support the feasibility of a school-wide contracting center which provides academic support across teachers and subject areas. While previous applications of educational contracting have been limited to single classrooms (e.g. Yarber, 1974) or individual student programs (e.g. Bristol and Sloane, 1974), the GSC was available to all teachers and students in an entire high school. Since students served as staff, expense to the school system was minimal. Furthermore, little teacher training was required as no
one teacher was directly responsible for any complex procedures.

The project was used by students with effective skills as well as those with major skill deficits. The majority of participants had grade point averages in the middle range; approximately equal numbers of high and low performing students used the service. Additionally, the medium-level performers accounted for most of the contracts written. A sizeable number of high and low performers used the procedures only once or twice and did not return. Presumably, the high-level students used the center for novelty reasons. The low-level students probably were reluctant to return because of pressure on them to produce an acceptable work product. A history of failure is likely to have made center stimuli aversive. Students with chronic skill deficits (e.g. lack of reading skills) presented some problems for the center. The procedures were designed to augment group instruction, and involved numerous brief interactions. Thus, intensive remedial programs could not be applied easily within the project structure. Furthermore, student participation was voluntary and it was observed that low performers did not attend consistently enough for an extensive training program. Conceivably, this problem could be addressed by arranging incentive
programs to motivate this group of students to participate. However, no such programming was done.

The center was most often used for math assignments; English and history students were also frequent participants. Math assignments were particularly adaptable to the contract procedures. Assignments were frequently short and criterion could be specified quantitatively (e.g. number of problems). Although no formal analysis was done, the ease with which contracts were adequately written probably contributed to a high completion rate, less time spent on paperwork and a more positive experience in the center.

Most student participants were from the ninth grade. The number of student users decreased as grade level increased. Ninth graders were in the high school building for the first time and were probably more likely to find center support useful in the transition from middle school work. It is unclear why upper class students used the GSC at a lower rate.

Contracts were completed at a high rate throughout the year. Ninety percent of contracted tasks were completed to criterion for most weeks despite the fact that elaborate incentive systems were arranged. In fact, no explicit consequences were consistently made contingent on task completion. Students were simply told
that they must adhere to the behavior-management requirements in order to continue using the GSC. Continued access was not dependent on task completion. Apparently, however, some implicit consequences may have been operating to increase the probability of work behavior.

At the most general level, knowledge of work results was provided to participants and probably served to strengthen response rate. (Tysaught and Williams, 1963). The staff also provided social praise for progress and contract completion. Some teachers may have provided praise for work done when the contract form was returned to class by participants or awarded other consequences (e.g. points) which affected work behavior. However, no records of teacher-administered consequences were maintained.

The stimuli of the structured GSC environment may also have effected work rates and contract completion rates. In the absence of a sufficient history of independent performance, early contract work was probably influenced by audience control. Based on Skinner's (1957) analysis of verbal behavior, we know that an audience (listener) may exert control over the probability of response by a speaker. In the complete absence of a listener, overt verbal behavior is not
likely to occur. When an audience is present, the type of response emitted is determined by the reinforcement history of the speaker in the presence of that audience. The audience serves as a stimulus which allows the speaker to differentiate responses likely to be reinforced from those not likely to result in positive consequences. If we apply this analysis to contracting, the persons present during negotiation may affect the probability of work completion. The presence of the adult manager and student staff members in the center may have effected compliance in this way. Since work was reviewed frequently and staff were in close proximity to the student, the audience control in the GSC was conceivably greater than in the classroom. When a class is large, a teacher may be unable to provide frequent or close scrutiny of work. Given a history of reinforcement for work done under supervision, the presence of a staff member could serve as a discriminative stimulus for adequate performance. Furthermore, audience control is probably most pronounced when the contract is negotiated and work is done with an audience present. The GSC procedures can be contrasted with a situation where a contract is negotiated with an audience present, but the work is done elsewhere.

On the basis of person-to-person audience contact,
the initial rate of work may be increased. However, it is likely that sustained performance eventually was controlled by other stimuli present in the GSC environment. After exposure to close supervision and social reinforcement for task completion, simply being present in the center may strengthen the probability of a class of responses which is essential to contract completion. As Skinner (1957) indicated, places may come to serve as audiences. For example, when we are in church, we are likely to emit verbal behavior previously reinforced in that place (e.g. statements about moral behavior) and do not emit responses which have resulted in punishment (e.g. obscenities). Thus, once a student has used the GSC for a time extensive interpersonal support may not be necessary to produce adequate performance.

If the GSC environmental stimuli came to increase the probability of work behavior, the components of the contract may also have acquired stimulus control by association. Performance to contract criterion and the contract components may come to be associated with reinforcement, if other environmental stimuli are powerful enough to cause the student to work and come in contact with available consequences. Thus, the task description and criterion statement may acquire
discriminative power. If this occurs, simply the presence of the written agreement may increase the chances of task completion.

Contract components other than task description and criterion provide support for task completion provided that a sufficient history of reinforcement has occurred. A signature by contracting parties appears to be an important variable. For adults, a history with legal contracts probably provides the discriminative power for this component. Students may associate a signature with previous occasions where documents of some consequence were signed by a teacher, parents, medical personnel and so on (e.g. passes, report cards, excuses for absences, etc.). The GSC contract also included a time interval allowed for work, after which performance was evaluated. Most students have probably received reinforcement/punishment for completing a task on time/late. A written agreement also requires that some form of public commitment to change behavior be made. At a minimum, overt verbal agreement to comply with contract conditions is necessary. This arrangement can be contrasted with the case where a teacher states a contingency and no immediate student response is required. The student may have received some unpleasant consequence for failing to do what he/she publicly indicated would be done.
Additionally, via the public commitment, other persons in the environment (e.g. other students, parents) may learn of the agreement and provide some impetus for compliance. Some researchers in clinical contracting required contractees to publish their intention to change in public documents in order to apply environmental pressure (e.g. Elliot and Tighe, 1968).

Once early success is achieved, the complexity of the contract task can be increased as the student is shaped to perform for longer periods of time for less reinforcement. The factors just discussed play a particularly important role in the production of initial success. Thus, contract performance is first under audience control, then the more general control of the contract-work environment and finally the contract components themselves, especially the task description and criterion. Through a series of successive approximations and the strengthening of response patterns which result in success, a contract can be used to facilitate behavior changes large enough to affect classroom performance in general.

The results of Experiment I can be explained by the above analysis. If the students learned to respond to a contract task description they may, by stimulus generalization, have become more likely to respond
appropriately to task descriptions of other kinds (e.g. classroom assignments). Thus, students who used the GSC, may have learned skills which were applied to classroom work where a contract was not used.

The factors discussed so far involve the structure of the contracting environment and all were probably operating to some extent in the GSC. The three experiments also included variations in the negotiation process by changing the interactions between contractor and contractee. Student participation has been shown to be an important variable in the production of acceptable academic behavior. (Lovitt and Curtiss, 1969; Karraker, 1977; Arwood, Williams and Long, 1974; Felixbrod and O'Leary, 1973). In general, research indicates that when magnitude of reinforcement and task complexity are held constant, increased student participation in the determination of learning contingencies improves performance. Arwood, et. al. (1974) concluded that

"... a strong case can be made for the efficiency of student involvement in the development of a contingency management system. Involving the students in the formulation of contingencies will not necessarily change the nature of those contingencies but will enhance the reinforcement value of operating under those contingencies." (P. 435).

Variation in student participation in the present experiments can be characterized in terms of a continuum
of environmental support during contract negotiation. In Experiment I, students wrote contracts with peers in the GSC. In Experiment II, student participants wrote their own contracts in the center. Teachers and students negotiated contracts in the classroom in Experiment III. In the first case, the support of the center environment was provided in the form of staff participation. In the second study, the environmental stimuli of the center and the contract form were present but no negotiation assistance was given. Last, the contract was negotiated totally outside the center with no GSC staff present. No differences in classroom performance were observed when the changes in negotiation procedures were implemented. Student-written and teacher-negotiated contract conditions resulted in performance similar to that seen as a function of use of standard GSC methods.

The fact that decreased center support in contract negotiations resulted in no performance changes has implications for self management skill training. When students wrote their own contracts in Experiment II, they did so without staff assistance. The forms were completed accurately and work completion rate remained high. These data show that participants learned how to analyze a task and write a criterion statement which facilitated adequate performance. In fact, student participants completed the
forms as effectively as student staff who were trained in the procedures. Based on these results, it seems reasonable to assume that these students could perform a similar analysis of tasks to be done while working independently at home or in the classroom. Of course, the contracts were written in the GSC and the audience control discussed previously undoubtedly exerted some influence on the behavior.

However, when contracts were negotiated with teachers outside the center, performance was not effected. This result provides an indication that the skills learned in the GSC were useful outside the center. Since teachers received only minimal training in the contracting procedures, it is likely that students determined the content of contracts. Anecdotal reports from teachers support this assumption. Teachers frequently allowed students to complete the agreement and then approved the conditions. This process is identical to the final stage of the transition to student-controlled contracts as described by Homme, et. al. (1969).

None of the present studies provide data on performance once the contract is no longer used. Unfortunately, little is known about the most effective methods of eliminating formal contracts without decreasing performance. Clinical applications typically include
follow-up measures to determine if behavior is maintained. However, methods of producing long-term behavior change have not been studied empirically. The most reasonable approach appears to involve the transfer of control from the GSC and the contract form to other stimuli which are more readily available in the classroom or at home. At least two types of stimuli are commonly available; those produced by persons other than the student in the target environment and those produced by the student him/herself. In the case of academic performance, parents could be trained to monitor work done at home and teachers could be instructed to adequately specify and monitor behavior by means other than a contact. However, parents may not be present for a significant portion of homework time and teachers must program for large numbers of students. In both cases, precise control is probably not feasible. Furthermore, as Tharp and Wetzel (1969) pointed out, the mediator's behavior must be maintained by changes in client behavior, if monitoring is to be effectively continued. Parents only infrequently observe performance improvements (e.g. once every marking period) and thus, may not be reinforced by small changes in student behavior. Although teachers may observe performance changes, the number of students to be monitored again prohibits efficient reinforcement of approximations of
appropriate behavior.

A more reasonable approach involves training students to manage their own behavior for a significant portion of work time. In order to suggest a method of training, an analysis of self-managed performance is necessary. To produce adequate performance independent of a written contract, another stimulus must serve the function of the agreement in less explicit ways. If the teachers or parents cannot provide these stimuli consistently, then perhaps the student can produce conditions which affect the probability of his/her own behavior. If the contract has been used as a model and resulted in reinforcement, then a similar covertly-produced stimulus may be used by the student.

As Skinner (1957) has explained, one person can serve as both speaker and listener. A person may repeat previously experienced verbal behavior when he/she is the only audience. The stimulus may effect the probability of another response in the repertoire of the same person who produced it. Thus, it is conceivable that a student may repeat contingencies like those once stated in a contract to him/herself and respond as he/she did to the written statement. If the student was reinforced for following contract instructions, the self talk may serve as a discriminative stimulus. The probability of the stated
behavior might therefore be increased. As Micheal (1970) pointed out,

"Statements about behavioral consequences have some of the same effects on the child that a history of experience with such relationships would have." (P. 35).

As a function of experience with the contract contingency statement, the student may learn a rule. This is of the form: If I do X then I will get Y. The rule is initially produced overtly and eventually comes to be produced as self talk when the student repeats the statement covertly. The intensity of the overt stimulus (the contract statement or an overt vocal form of it) is simply reduced until it is no longer easily observed by others. Skinner (1957) referred to this process as response reduction. As with any behavior, if the private stimulus results in a response that is reinforced, future statements serve as discriminative stimuli. Once the covert statement becomes a sufficiently powerful antecedent, the external stimulus (i.e. the contract or an audible vocal statement) is no longer necessary to produce effective behavior.

Based on the above analysis, the efficient removal of contract support must include programming designed to teach a student to effect his/her own behavior. Furthermore, the training must focus on the acquisition of verbal behavior which can be used to increase the chances
of independent performance. The following general steps are suggested as a method of training self management.

1. Once the student is performing well when a written agreement is used, the contract should be withdrawn.

2. The student is asked to state the contingency overtly prior to beginning work. This initial phase is done under close supervision (i.e. in the GSC). During the work period, the student is asked how much of the task he/she has completed and again is asked to vocally state the contingency.

3. The number of progress checks is gradually reduced, while the accuracy of student responses is monitored. If the student inaccurately states the contingency on any progress check, the number of inquiries should be maintained until accuracy is 100 percent.

4. The monitoring procedure is withdrawn completely and the student is told to work in study hall or the classroom without center assistance.

5. Follow up progress checks are made in class or study hall by the teacher in charge.

During the above process, classroom performance measures should be recorded frequently. If performance decreases substantially, retraining is necessary. Eventually, the support program could be withdrawn.
completely. Presumably, the student would have learned to identify the components of the relevant contingencies and to state the behavior and consequences. If the analysis presented earlier is correct, performance should be maintained at a high level in the absence of a written statement or GSC support. Research of this type is currently being planned.

In conclusion, it appears that self-managed academic behavior can be trained under the control of overt stimuli (i.e. GSC environment). If this control can be effectively transferred to stimuli produced by the student, then individualized programming can be achieved more easily. If students require only limited instruction from a teacher after training, then individualized programming even with a large class, becomes manageable. However, care must be taken not to expect too much. If environmental support is withdrawn too quickly, then success may not occur consistently or at all. The transition from overt to covert control must be carefully programmed. Of course some would contend that this type of programming is too time consuming. Perhaps that is true. But, as with any educational program, the benefits must be compared to the costs before an informed decision can be made and much remains to be done before the benefits are identified.
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