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Fixed versus Random Scheduling of Classroom Activities in a Resource Room Setting

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Abstract of

Fixed Versus Random Scheduling of Classroom Activities in a Resource Room Setting

A Thesis Presented

to the Department of Special Education

in Partial Fulfillment of the Degree

Specialist in Education

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Specialist in Education Thesis

Title: Fixed Versus Random Scheduling of Classroom Activities in a Resource Room Setting

Resume: There has been a dramatic upswing in the number of resource classrooms and students in the last decade. There has also been a lack of research regarding resource students in the resource setting. While teachers have assured that regular classroom practices or methods used with other specialized populations were also appropriate for this new kind of student and setting little research has been done to either support or reject these practices or methods. The purpose of this study was to determine the effect which assigning class takes in a fixed order, rather than a random order, had on the numbers of problems completed and the numbers of disruptions made by two resource room students in the resource room setting.

The population of this study was two elementary students in a rural northeastern Iowa school district. The girl, a fourth grader, and the boy, a fifth grader, had both been staffed as learning disabled and emotionally disturbed. Both students had attended the resource room seventy minutes daily with two other subjects, but both had worked on independent work.

An ABAB single subject design employed because ran-

dom sampling was not possible in the resource room and because the design allowed the focus of attention to be drawn on subjects' individual behaviors. The phases differed only in whether daily assignments were presented in a fixed or random fashion.

Three sets of data were analyzed. Each subject's scores were analyzed individually for both the number of problems completed and disruptions made. Then the combined scores for both subjects were analyzed. Visual inspection showed that in each analysis the number of problems completed by the subjects in the fixed phases was greater than the number of disruptions made in the two random phases. The results were consistent for both subjects individually and for the combined data.

The results definitely indicate that assigning tasks in fixed rather than random order does increase the number of problems completed and decrease the number of disruptions made by resource room students in the resource room setting. However, while the results do contribute to the understanding of the resource room child in the resource room setting areas for further study, including the use of differing assignments and behaviors and of group work were suggested.

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This Study by: Joanne Broadston

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has been approved as meeting the thesis requirement for the Degree of Specialist in Education

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Chapter 1

THE PROBLEM

Introduction

Classroom environment has been a sorely neglected area in educational research. For many years researchers examined in depth methods and materials thinking that if the correct methods and materials were used students would learn with little attention being given to other factors in the learning situation. These other aspects were, by in large, left to tradition, personal opinion, or chance. Articles written about possible environmental variables were often descriptive in nature, not validated research. Only in the past decade or so have researchers realized and started researching the impact of environmental variables on students.

Since then social aspects have received much of the attention. Studies have shown that teacher presence (Peterson and Whitehurst, 1971), teacher praise, admonishment, or purposeful ignoring of students (Becker, Madson, Arnold, and Thomas, 1968; Thomas, Neilsen, Kuypers, and Becker, 1968; and Hunter and Meyers, 1972), teacher expectations (Rosenthal and Jacobson, 1966), and the level of teacher actions and behaviors (Measel and Mood, 1972) can be used to positively change student be-behavior. The rise of behavior modification practices,

a major revolution in educational thinking, appears to be related to the upswing in educational research in this area. Researchers have also shown that group consequences for behavior can be effective in changing individual behavior (Barrish, Saunders, and Wolf, 1969) and that group attitudes toward classes can be measured and the results used to improve attitudes of subsequent classes (De Young, 1977). However, a class's group anxiety level was not found to be a factor in academic achievement (Osterhouse, 1975).

Physical and programatic variables have not been as well researched. Studies in physical classroom variables have basically dealt with the effect of seating arrangements on student performance (Wulf, 1977) or the removable of the student from the classroom for a time-out period (Hamilton, 1971). Programatic variables include all details of class content, structure, and scheduling. Barcai (1975) determined that a group remedial program and a group counseling program were more effective than a control group art activity in remediating language deficiencies of lower socio-economic middle tract students while McKeown (1977) found that requiring students to be orally accountable for answers to written questions was more effective than not requiring such accountability.

Ramayya (1972), in a study of classroom structures,

found that non-graded classrooms may be more effective than graded classes for boys but not especially for girls while Bachtold (1974) found learning centers more effective with gifted students than special classes or enrichment programs. Innes (1973) and Klein (1975) found that social interactions and the creative abilities of low anxiety level students, respectively were enhanced by open class settings while Werner and Simpson (1974) found no difference in academic achievement between subjects in traditional and open classes. Wheeler and Ryan (1973) and Dowell (1975) determined that students in competitive and cooperative classes did not differ significantly in academic achievement. Johnson, Johnson, and Bryant (1973), however, suggested that cooperative programs might be more beneficial because students prefer them.

In a study dealing with class scheduling Sanders and Hanson (1971) found that rescheduling student activities could effectively change teacher-pupil interactions and result in higher levels of completed assignments for the whole class. Doke and Risley (1972) found that the level of children's participation in preschool activities did not differ if the children were required to follow a schedule of activities as long as they were allowed to start the next activity as soon as they finished the pre-

ceding activity and as long as there was an abundance of materials. Frederiksen and Frederiksen (1977) took this one step further by investigating the effect that fixed assignment ordering, rather than random ordering, had on trainable mentally retarded adolescents in a self-contained class. They found that by using a fixed order higher rates of task completion and lower rates of disruptions could be established.

These students indicate that while researchers have started to delve into classroom environmental variables the results are often contradictory and represent only a small fraction of the possible variables and settings which can influence student academic and social performance.

Importance

This study was primarily undertaken because of the lack of research regarding resource room students' behaviors in the resource room setting and because of the dramatic upswing in the numbers of resource classrooms and students in the last five years. In these new classrooms teachers have generally assumed that methods devised for use with regular classrooms or with other specialized populations would also be appropriate for resource rooms. However, the resource room environment is very different from the regular classroom. In addition,

just because a student has special problems doesn't mean that his or her behavior can be compared to the behavior of other types of special students. Only after behaviors of resource room students have been thoroughly investigated in the resource room setting can we be sure that appropriate methods of teaching these students are being employed.

Assumptions

Two assumptions must be made regarding this study. First, it must be assumed that the student population and the resource room chosen for this study are representative of the general population of elementary resource students and resource rooms. Without this assumption the value of the experiment would be in doubt because no definite conclusions could be made except that the treatment does or doesn't work for one particular population in one particular setting. Secondly, it must be assumed that the academic tasks chosen and the types of disruptions measured by this study represent typical assignments and behavioral problems encountered in the resource classroom. Without this assumption generalizations regarding the effectiveness of this procedure with other types of assignments or disruptive behaviors cannot be made.

Limitations

This study cannot be used to predict the behavior of

any type of student in any setting with any materials. Its conclusions are limited to learning disabled or emotionally disturbed elementary students in a resource room setting. It is further limited to such students following the general routine and using the same general type of assignments as were used in this experiment.

Chapter 2

REVIEW OF LITERATURE

Frederiksen and Frederiksen (1977) have described classroom environmental variables as being physical, social, or programatic in nature.

Social Variables

Social Variables are all factors originating from each individual or from the group which affect how a particular student or a group behaves. Most studies in this area have dealt with the effect that teachers have on students or with the effect the whole group has on group or individual behavior.

Interactions involving teachers and students. Rosenthal and Jacobson (1966) investigated the effect which teacher expectancy had on student intelligence scores during an eight month period. The subjects in the study were all of the students in eighteen elementary classrooms in one school building. Eighty percent of the students were used as controls while the remaining twenty percent, who were chosen at random, were directly involved in the study. At the beginning of the school year all subjects were given the Flanagan Tests of General Ability, a non-verbal intelligence test. The teachers of the target children (the twenty percent) were told that the results of this test indicated that these stu-

dents would show unusual gains in intelligence that year. At the end of the eight month period all children were again given the same intelligence test. The twenty percent for whom the prediction had been made did show significantly greater increases in intelligence scores than did the control group. It was also shown that the lower the grade level the more pronounced the group differences were. The authors concluded that teacher expectancy was a major factor in pupil intellectual growth, especially in the lower grades, and should be explored further.

Peterson and Whitehurst (1971) explored imitative behaviors to determine variables which influence their performance. The subjects in this study were two boys and two girls who ranged in age from four years eight months to five years two months, and who attended a university preschool nursery class. The subjects were all rated as average or above in intelligence and social-motor skills. However, the youngest child, a girl, did not complete the study so her data was deleted from the results. Each student was seen individually three to five times each week for approximately fifteen minutes. They were told they could win a toy by earning enough beads through imitating the experimenter. The experimenter told the subject to do a behavior, modeled the behavior,

and gave the subject twenty seconds to perform the behavior. Eight separate conditions were tested. These were (in order of occurrence during the experiment):

(1) Consequences. The subjects were given a bead for each correct response.

(2) Delayed Consequences. The subjects were given a bead for each correct response twenty seconds after the behavior occurred.

(3) Predelivery. All beads were given to the subject at the beginning of the period.

(4) Delayed Consequences: 20 Plus Good. Subjects were given a bead for each correct response twenty seconds after the response occurred. The experimenter also said "good."

(5) No Consequences. No beads were given regardless of response.

(6) Differential Consequences. Beads were given for incorrect responses.

(7) Experimenter Absent. The experimenter modeled the behavior and left the room. After ten seconds he re-entered the room and modeled the next behavior. No beads were given during this phase.

(8) Experimenter Present. This was identical to the fifth phase.

The results of this experiment showed that student

imitative behavior remained extremely high (above ninety percent) for all phases except pre-delivery and experimenter absent. In these phases behavior dropped to an average of 84 percent correct behavior for the pre-delivery phase and from approximately ninety percent to approximately twenty percent correct behavior in the experimenter phase. The experimenters noted the durability of the imitative behaviors "despite the application of a variety of techniques designed to weaken the responses (p. 5) and concluded that "the presence of the experimenter immediately before and during the opportunity for the subject to respond may control the subject's response" (p. 6).

A second experiment was then conducted by the same authors. This time two different boys and two different girls, aged five years five months to six years eight months, were studied. Conditions during this experiment remained the same except that only three phases were used. These were: 1) experimenter present, 2) experimenter absent, and 3) a return to the experimenter present condition. The authors found that while correct imitative behavior was consistently above ninety percent during the first and last phases it declined sharply in the second phase to less than ten percent correct behavior. The authors again concluded that experimenter presence or absence is a major factor affecting pupil imita-

tive behaviors.

Becker, Madsen, Arnold, and Thomas (1967) studied ten subjects, two in each of five different classrooms in an urban mostly black school. Their purpose was to

> demonstrate how selective use of teacher attention and praise can be effectively applied in managing behavioral problems... (and) also explore methods of training teachers to be more effective in this regard (p. 281).

Subjects were chosen first by observing the classes of seven teachers who had indicated interest in participating in the study. Observers picked several children who exhibited problem behaviors. Final selection of ten children was then made based on the frequency of the behaviors and whether they could be reliably rated. Before the experiment began the problem behaviors were clearly defined and observers practiced recording them until interobserver agreement was above eighty percent. To ensure observer accuracy reliability checks were also taken each day during the first week and periodically thereafter. During the experiment the observer rated each child daily for twenty minutes. The experiment itself consisted of a baseline period of five weeks followed by a nine week experimental phase in which students were advised of class rules and teacher praise was given to those students fol-

lowing the rules. Inappropriate behavior was ignored. Special rules dealing with the target children's special behavior problems were also set up and dealt with in the same manner. The experimenters found that deviant behaviors decreased significantly for all ten children during the experimental phase.

Thomas, Nielsen, Kuypers, and Becker (1968) attempted to replicate and extend the Becker et al (1967) study to prove further the effect of praise, attention, and purposeful ignoring and to establish what effect remedial tutoring in reading would have on student classroom behavior. The subject was a six year old Negro boy in a predominantly white school who exhibited severe academic and behavioral problems. During the experiment observers rated the student twenty minutes daily noting either appropriate behavior or one of nine types of inappropriate behavior at ten second intervals. Reliability checks were taken periodically to ensure accuracy of the observations. A baseline phase of eight days was followed by a "low approval phase" in which the teacher gave praise and attention for behavior which "facilitated learning or was incompatible with disruptive behavior" (p. 296). After eight days a ten day "high approval" phase was instituted. This was identical to the "low approval" phase except that a counting machine was provided to re-

mind the teacher to give the student praise at approximately one approval reaction per minute. This was followed by another "low approval" phase in which the counting machine was removed and teacher approval dropped below one approval per minute. Finally, a high approval with tutoring phase was instituted. This was identical to the previous high approval phase except that daily remedial reading tutoring was given to the subject. This phase was in effect the last six weeks of the school year and throughout a summer school program. At the end of the experiment the student was retested in reading and language skill abilities. The researchers found that inappropriate behavior was lowest in the high approval with tutoring phase, next lowest in the high approval phase, third lowest in the two low approval phases, and greatest in the baseline phase. A gain of six months was noted in language and reading abilities. The experimenter concluded that "the teacher's use of differential social reinforcement played an important role in reducing some of (the student's) disruptive behavior" (p. 301) and that the remedial program enhanced the results.

Hunter and Meyers (1972) observed 117 pupils in eleven special classes for the educationally handicapped. The purpose of this study was to determine the effects which specific classroom characteristics (teacher accep-

tance or rejection, problem centeredness, directiveness, and teacher control) had on pupils' task-oriented behavior, pupil attitude, and academic achievement. The authors rated each classroom's teacher with a revision of Withall's (1949) Socio-Emotional Climate Index. Pupil attitudes were measured by giving the Pupil Attitude Inventory and the Ohio Social Acceptance Scale. The Wide Range Achievement Test was given to each student in October and May to measure academic achievement. The authors found the following to be true.

(1) Classrooms high in acceptance and/or low in rejection have higher levels of favorable pupil attitudes toward school.

(2) Classrooms high in problem centeredness have pupils with more favorable attitudes toward work.

(3) Classrooms with high levels of teacher control have pupils with more task oriented behavior and better arithmetic achievement levels. However reading and spelling achievement were not found to be different between this and any other group.

(4) There were more pupil absences in classrooms with low levels of teacher control and teacher acceptance.

(5) Male teachers had students with more favorable school attitudes.

The authors concluded that teachers can carefully use such characteristics in their classes to positively affect student attitudes and achievement.

The effect which teacher verbal behavior and actions had on pupil thinking in an elementary school was investigated by Measel and Mood (1972). They hypothesized that teachers who spoke or acted with more "indirect" behavior would have students who thought at higher, more abstract levels than teachers who taught in a "direct" fashion. Examples of indirect behavior included use of praise, acceptance of student behavior or ideas, and asking questions. Direct behavior included lecturing, criticizing, and giving directions. The subjects were fifteen female teachers and their 399 second grade students from three middle to upper middle class midwestern communities. Observers rated teacher and pupil behaviors in each classroom using Flander's interaction analysis and a three tiered level of thinking analysis. In this system level A involved statements of a direct nature, level B involved such activities as grouping or labeling, and level C involved reasoning activities. In analyzing the data the authors found that although there was not a significant relationship between teacher actions and pu-

pil level of thinking there was a direct relationship between teacher verbalizations and pupil thinking behaviors. In other words what the teacher said influenced student thinking, but whether the teacher used a direct or indirect action did not. They also determined that teachers using direct behaviors tended to think more concretely than teachers who exhibited more indirect behaviors. The authors concluded that since directness of teacher verbalizations does have a major impact on students teachers should be taught to use more indirect verbal behaviors to stimulate higher pupil thinking levels.

Interactions involving whole class behavior. Barrish, Saunders, and Wolf, (1969) investigated the effect of group reinforcement on the behavior of individual problem children and of a whole class. The subjects in this study were 24 fourth grade students, seven of whom had serious problems with disruptive classroom behavior. Observers recorded the disruptive behavior of all students. Two specific behaviors, out-of-seat and talking-out, were then chosen for this study. Four phases, constituting both a reversal and a multiple baseline design were used. The phases were as follows.

	Math	Reading
Phase 1:	Baseline	Baseline
Phase 2:	Game	Baseline

Phase 3: Baseline Game

Phase 4: Game Game

The baseline phases were a continuation of the regular class routine. In the "game" phases the class was divided into left and right halves. Each team received a mark on the chalkboard any time anyone in their team broke one of the rules pertaining to the target behaviors. The team with the least points became the winning team, earned special privileges such as being able to line up first, and received a special free period at the end of the day. In addition, any team earning less than twenty points during the total week received a special bonus. The authors found that inappropriate behavior was significantly higher in the baseline phases and lower when game conditions were in effect. They concluded that the program was effective in lowering both individual and whole class disruptive behavior.

Two classes of a required sociology-social psychology course at a large southeastern university were studied by De Young (1977) to determine if classroom social climates could be measured and the results used to improve classroom attitudes and attendance in a subsequent class. The author administered the Classroom Environmental Scale which consists of ninety true or false questions in which students assess the real and ideal environments of their

class. From this data the author detailed areas in which there were major discrepancies between what students perceived as ideal and what they really saw in their class. He used this data to reorganize the course for the next semester. At the end of the second semester the author found that while student perceptions of the ideal classroom did not change appreciably from the first semester perception of what the class was really like did approximate the ideal situation much closer than it had in the first semester, that students were much happier with the class, and that attendance increased significantly. He concluded that such studies could be effectively used by other teachers to enhance their classes.

Osterhouse (1975) studied 412 undergraduate students in two sections of a psychology class to determine what effect personal and whole class anxiety levels had on the semester's test scores. The author selected low, middle, and high anxious students by choosing the thirty lowest, thirty closest to means, and thirty highest scoring students respectively on the Inventory of Test Anxiety. Whole class scores also showed a definite difference between the classes. The higher scoring class was labeled the high anxiety section while the lower scoring section was labeled the low anxiety section. Following each of three class examinations reworded versions of the

same anxiety measure were given to each student. The author found a significant relationship between the examination scores of the high anxious students and the examination scores of the moderately anxious students favoring the moderately anxious students. However, no difference was found between the scores of the moderate and low anxiety groups or between the high anxious class and the low anxious class. The results indicate that while a high level of personal anxiety may be a factor in academic achievement the overall class anxiety level is not.

Physical Variables

Physical variables are those aspects of the classroom involving the types or arrangement of physical objects in the classroom. Hamilton (1971) studied five female severely or profoundly retarded institutionalized females in an experiment designed to decrease aggressive and destructive behaviors ranging from headbanging to physical abuse of other patients. In each case as soon as the patient exhibited a target behavior she was removed to a time-out area for periods varying from one half to two hours. The author noted significant decreases in the target behaviors for all five subjects and concluded than punishment, especially time-out, was an effective procedure which should be researched further and used to evoke behavior changes.

Wulf (1977) investigated the relationship between seating choice and classroom verbal responses, cumulative grade point average, and grade in class. The subjects in the study were two sections of a college psychology course which each contained approximately forty students. In the first class students were allowed to choose a seat during the early class periods, but then were required to keep those seats all semester. The second class was assigned seats using reverse alphabetical order. An observer counted the number of on-task student responses for each student during each class period. Cumulative grade point average and grade in class were collected at the end of the semester. At the end of the semester the second class was also asked to indicate where they would have liked to sit if seats had not been assigned. The results were analyzed for both rows and action zones. These zones basically divided the room by whether the seat was in the front, middle, or back of the room and whether it was in the left, middle, or right side. For the first class, where subjects were allowed to choose their own seats, the authors found that students in the immediate right side action zone gave significantly more class responses and those in the middle center and middle back gave significantly fewer class responses than the other students. However, no other significant corre-

lations could be found among the variables. There were also no significant correlations for any variable in class two where seats were assigned. In analyzing the questionnaire the authors found that students who earned above average grades in the class stated significantly more preferences for front or middle seats. No conclusions were drawn for the other students. The authors concluded that seating alone was not a significant factor in the grade earned but that the good students tended to do well no matter where they were seated.

Program Variables

Program components are those parts of the system which deal with class structure or content.

Class Content. Barcai, Umbarger, Pierce, and Chamberlain (1973) studied 62 middle tract upper elementary students from a lower socio-economic environment. The purpose of their study was to determine which of three methods---group counseling, group academic remediation, and an art activity used as a control---was the most effective in remediating language deficiencies. Each subject was assigned to one of the groups using a matching procedure involving age, sex, grade, Iowa Test of Basic Skills scores, and severity of behavior problems as rated by the classroom teacher. Prior to and after remediation the students were rated in language abilities with the

Wechsler Intelligence Scale for Children or the Wechsler Bellevue, a story telling measure using Peabody Individual Achievement Test pictures, teacher ratings, and Iowa Test of Basic Skills test scores. The group remediation involved language games and activities such as "I Spy". The group counseling approach involved direct conservations about classroom problems and understanding the self. The art activity involved letting the children express themselves in a non-verbal artistic way. The authors found that although neither the group remediation or the group counseling approach was significantly better-than the other they were both significantly better than the art activity in overcoming language deficits. However, the authors noted that because significant differences, such as teachers with different personalities and teaching procedures, existed among the groups the results could not be positively stated as fact.

McKeown (1977) studied 290 ninth and tenth middle class surburban students in three classes of two California urban high schools in order to determine whether or not accountability in responding to classroom questions affected student performance. At the beginning of the school year each class was randomly divided into four sections. These sections were: accountable low order, non-accountable low order, accountable high order, and

non-accountable high order. In all sections of each class students read social studies materials for twenty minutes, answered in writing questions over the materials for fifteen minutes, and then discussed the answers to the questions for fifteen minutes. In addition, the students in the two non-accountable groups volunteered answers during the discussions whereas the other groups were required to be accountable for, or answer questions if asked to, during the discussions. The second differentiation made among the groups was that the two high order groups answered questions involving causes and effects which were classified as high order while the two low order groups were required to answer questions involving primarily recall and recognition which were classified as low order. A pair of tests involving low and high order questions was given to each student on October, November, and June. The results showed that both collectively and when analyzed individually the two accountable groups scored better on the tests than the two groups which were not held accountable to answer the oral questions. The authors also found that students trained to answer specific types of questions (low or high order) performed better on questions at that level than students trained to answer a different level of questions.

Structure. Ramayya (1972) studied differences in

academic and social skills between forty girls and forty boys who had completed grades kindergarten through sixth in a traditional school system and forty girls and forty boys who had completed grades kindergarten through sixth in an ungraded school system. The purpose of the study was to determine whether there were significant differences between the two groups in reading achievement, language achievement, arithmetic achievement, personality variables, and classroom climate. The children were matched by sex, intelligence quotient scores, and socioeconomic status. Each child was given a battery of tests covering academic, anxiety level, and social functioning. Test results were analyzed using a t-test. Although Ramayya found only a significant difference in self-esteem in favor of the nongraded approach between the two groups of girls there were several variances between the groups of boys. The author found that boys in the nongraded program were significantly better in all academic areas and in self-esteem. However, the boys in the graded program got along better with each other socially. The author concluded that a nongraded approach was more beneficial, especially for boys.

Bachtold (1974) studied three different learning environments to determine what effects they had on the verbal creativity of 58 middle-class, predominantly Caucasian

fifth and sixth grade gifted students. The students had each received a score of at least the ninety-eighth percentile on an individualized intelligence test and were assigned to one of three different programs. The first setting was a self-contained class where students spent all day in a program for the gifted. The second was an enrichment program where students participated in selected activities designed to develop their special interests and provide "in-depth experiences beyond the regular class curriculum offerings" (p.226). The final setting was a learning center where students participated in "freeflow research" (p. 226) when not attending their regular class program. All children were given the Torrance Test of Creative Thinking at the beginning and end of the school year. The test was scored for fluency, flexibility and originality. The beginning school year test showed no significant differences between boys and girls or between fifth and sixth graders. However, although not significant the learning center program students were more fluent than students in the other two groups. The spring retesting showed no differences when students were compared by sex or grade level. However, the learning center students were significantly better than special class and enrichment students on the fluency measure and the total test score. There was no dif-

ferences between the scores of the special class and enrichment students. The author concluded that

> the year's program for this gifted...population was particularly effective in encouraging 'openness to new experiences and ideas', and the learning center location was especially conducive to the generation of many ideas (p. 228).

Fifteen students selected at random from open and closed classroom situations were studied by Innes (1973) to determine how social interactions differed in the two settings. Each of the students' classrooms were designed so that part of the day was spent in an open class setting, and part of the day was spent in a traditional setting. Each student was observed once during the closed setting and once during the open setting for a total of thirty observations. Innes found significantly more social interactions and interactions where peers led each other into activities during open class settings. However, there was also less "casual exchange" (p. 41) behavior. The author also found a strong tendency (not significant) for more time spent in social interactions in the open class setting.

Werner and Simpson (1974) investigated academic performance and attention to task behaviors of well adjusted,

moderately adjusted, and poorly adjusted students in open and traditional class settings to determine what effect pupil adjustment level and classroom environment had on classroom functioning. The subjects were eighteen first graders in an open class setting and eighteen first graders in a traditional class of a large suburban school district. In each group the classroom teacher rated six students as well adjusted, six as moderately adjusted, and six as poorly adjusted using social, academic, and behavioral characteristics as guides. The two groups did not differ significantly in chronological age or intelligence. Attention to task was measured by observing each child daily for fifty minutes. Observers marked either "attending" or "not attending" at five second intervals throughout the period. Task completion was computed as the percentage of problems correctly completed during the same fifty minute period. Data was analyzed by level of adjustment and by environment (open or traditional). The authors did find significant differences between the children when grouped by adjustment level favoring the well adjusted students, then the moderately adjusted, and finally the poorly adjusted students. However, there were no significant differences when the open and traditional settings were compared. The authors concluded that pupil adjustment level is a significant factor in classroom per-

formance but the type of classroom environment the children are placed into is not.

Klein (1975) observed 72 subjects in four third grade classes to determine how open and closed classrooms affected high and low anxious students. Of the four classes studied two were open classrooms and two were closed classrooms. Each of the eighteen subjects was matched to a subject in one of the closed classrooms by verbal intelligence, general anxiety, sex, and parental level of education. Highly anxious students were defined as those scoring in the upper thirty percent of the Sarason measure. Low anxious students conversely were those scoring in the lower thirty percent on the Sarason measure. Each subject was observed three times at random by two independent observers. From these observations Klein concluded that low anxious students in open classrooms were more creative than highly anxious subjects in either setting, but that low anxious subjects in a closed setting were not more creative than highly anxious students in the same setting. However, Klein did not clearly delineate how these conclusions were drawn from the observational procedures.

Johnson, Johnson, and Bryant (1973) studied forty sixth grade students in a midwestern suburb to determine individual differences involved in competitive and cooperative classrooms and to determine student perceptions

and preferences for each type of classroom. The subjects in this study were twenty externalizers and twenty internalizers chosen by pairs from twenty different classrooms on the basis of answers given on the Intellectual Achievement Responsibility Questionnaire. An internalizer was defined as a subject who attributed success or failure to himself while an externalizer attributed this to other people or to chance. Each subject was interviewed individually and shown three pairs of pictures. One picture in each pair depicted a cooperative setting while the other depicted a competive setting. The subjects were asked which one of each pair represented their classroom and which one they would prefer their class to be like. Answers were classified as competitive or cooperative depending on the pictures chosen. From the data observers detailed three findings. First, they determined that the majority of both internalizers and externalizers saw their classes as competitive. Secondly, they found that a majority of both internalizers and externalizers preferred cooperative settings. Finally, although not significant they found that more externalizers than internalizers preferred cooperative settings. The authors concluded that since cooperative settings are preferred and since other studies have shown that both types of students do well in cooperative settings the current state of affairs in which

the majority of students view their classrooms as competitive needs to be examined to see if better settings could be established.

In an effort to determine the effect of cooperative and competitive school environments on high and low anxious students Wheeler and Ryan (1973) studied 88 fifth and sixth grade mostly upper class, above average achieving students from a suburban midwestern school. Prior to the experiment all students were given the Sarason Test Anxiety Scale for Children. Those scoring above test mean were assigned to the high anxious group while those below test mean were assigned to the low anxious group. Both groups then participated in an eighteen day experiment. For the first nine days one class received social studies instruction in a competitive fashion. Students worked individually and were awarded prizes for the best work. In the second nine weeks they worked cooperatively. In the other class the situation was reversed with the cooperative setting first followed by the competitive setting. The researchers found that while students in both groups liked the cooperative setting better there was no difference between the high and low anxious groups or between the cooperative and competitive settings as to academic achievement.

Dowell (1975) studied 652 college students in an ef-

fort to determine whether competitive or cooperative learning situations are more conducive to learning a mental task. The experimenter divided the subjects into two groups and gave each subject a mental task in which they were to determine rules as to why targets had been placed in certain positions on several matrices. They were told they would be given twenty minutes to figure out the rules after which they would be given a test to see if they could choose correctly placed targets in other matrices. However, while the competitive group was told to work individually because the object for them to score better than anyone else the cooperative group was told to develop their rules together because the goal was to have their group do better as a whole than the competitive group. In analyzing the results the author found no difference between the two groups' test scores. He concluded that either the cooperative setting was not more effective or else the task was too hard for all subjects.

Saunders and Hanson (1971) studied one class of 23 third and fourth graders in a rural setting to determine the effect that restructuring teacher contacts with students would have on the numbers of assignments completed by the whole class. Prior to the experiment each child received assignments, completed them, and returned them to the teacher. The teacher checked them and assigned

more work. Teacher-pupil interactions, defined as any time the teacher touched the student or his work or talked to the student, were observed. These showed that with this procedure the majority of teacher-pupil interactions were between the teacher and the above average students. Sanders and Hanson then changed the procedure. Instead of receiving more work after completing assignments students were told to go to a play area. With this procedure the majority of teacher-pupil interactions shifted to contacts between the teacher and lower achieving students. This helped these students keep up with the whole class and resulted in increased numbers of completed assignments for the whole group.

Doke and Risley (1972) studied fourteen four and five year old Negro preschool children in an urban setting. Their purpose was first to determine the effect that allowing students options in choosing activities as opposed to requiring student participation had on students. A second purpose was to determine what effect allowing students to work independently through required activities had on students as opposed to requiring students to wait until all group members were done before starting the next activity. Finally, the experimenters wanted to determine how availability of materials affected student behavior. The experimenters set up two

reversal experiments. In phases one and three of the first experiment students were allowed to choose from several activities and to change activities at any time. In phases two and four students were required to participate in certain activities. For part of phase two students were required to wait until everyone was finished before starting a new activity. On other days they were allowed to move on as soon as they finished. In the second experiment all conditions were identical to the first experiment except that in each phase the number of materials was decreased. In both experiments the authors used the Planned Activity Check (PLA-CHECK) system where recorders note both the numbers of students and the numbers of students participating in appropriate activities in each area at three minute intervals. The authors found no differences in student participation between the options and no options phases as long as students were allowed to move to the next activity and there were enough materials. However, if students were required to wait for everyone to finish or if there weren't enough materials activity greatly declined.

Frederiksen and Frederiksen (1977) used a reversal design to investigate the effect that assigning tasks in a fixed rather than a random order had on the number of tasks completed and disruptions made by eleven adolescent

trainable mentally retarded students in a special class setting. In the first and third phases the morning activities were presented in the same order each day. In the two reversal phases they were presented in a predetermined random order. The authors found that disruptions significantly decreased and task completions significantly increased during phases with tasks presented in fixed order. They also found that disruptions significantly increased and task completions decreased when tasks were assigned randomly. They concluded that their results support the idea that scheduling can have a major impact on behavioral and academic aspects of the classroom.

These reports show that classroom environmental variables do have a significant effect on student performance and should be investigated further with sound, detailed studies. Only through such research can teachers truly understand and use these variables to their best advantage when teaching groups of children.

Chapter 3

DESIGN OF STUDY

Definition of Terms

Disruption. A disruption is either of two types of behavior, noise or disruptive physical activity.

Disruptive Noise. This is nay noise made by the mouth except (1) talking directly related to completion of the task the subject is working on at that moment, (2) talking which the teacher asks the subject to do or which is the direct response to a teacher's question, and (3) coughs and sneezes. Typical disruptive noises are humming, talking to other students, talking not related to the task at hand, whistling, and singing.

An example of noise directly related to task completion is a subject who asks how to spell 'add' during spelling class and 'add' is one of the day's assigned words. This is not a disruption. However, if the subject asks another student instead of the teacher it is a disruption. It is also a disruption if the subject asks how to spell 'add', for example, during any class but spelling or when it is not an assigned word.

An example of talking which the teacher asks the subject to do would be if the teacher says "spell 'add'". If the student responds by answering the question, even incorrectly, or by saying something like "I don't know"

it is not a disruption. Likewise, asking the teacher to clarify the statement by saying something such as "What did you say?" is not a disruption. However, any other type of student comment would be considered disruptive.

A genuine cough or sneeze is one which is the result of a cold, tickle in the throat, or other health related phenomena. These are not disruptive. However, if the child coughs or sneezes primarily to gain attention it is not considered genuine and thus is disruptive. A cough is considered not genuine and thus disruptive if the child looks around to see if he is getting attention or makes any comments about coughing. In all other cases it is considered genuine.

Disruptive Physical Activity. The second type of disruption involves physical activity. If a student moves his body or any other object in any way which causes another student to stop work, even momentarily, it is a disruption. Any movement which does not cause another student to stop work is not considered a disruption. There are only two exceptions to this definition. First, if the teacher asks the subject to produce a particular action it is not disruptive even if another student stops working. An example of this would be the teacher asking the subject to stand up and walk to the blackboard. However, if the subject makes disruptive noise while produc-

ing the requested action the noise is considered a disruption. Also, if the subject does additional movements unnecessary to completion of the requested action and these movements cause another subject to stop working they are considered disruptive. An example of this is if the teacher says "Go to the board" and the subject picks up and drops his books on the floor while walking to the board.

The second exception is any movement which is essential to task completion such as writing on the chalkboard during spelling. Again, if the subject makes disruptive noises or does a disruptive non-essential physical action while completing the requested action these are disruptions.

Problem Completion. A problem is completed when it is answered correctly. One hundred percent accuracy is required for each problem.

Fixed Order. Fixed order is assigning each of the four tasks in the same order each day throughout the entire phase.

Random Order. Random order is sequencing each of the tasks in a different order each day throughout the entire phase with sequencing done on a random basis.

Resource Room. A resource room is a classroom where students spend from thirty to one hundred twenty minutes

daily receiving supplemental instruction. The Department of Public Instruction for the State of Iowa has set specific guidelines as to which students can receive resource room help. A child must be significantly underachieving in any academic area, with underachieving ranging from a score of at least one standard deviation below mean in standard readiness or achievement measures in the first grade to an achievement rating of at least two grade levels below placement at the sixth grade level. The student must also be staffed by a diagnostic team as having a specific learning or behavioral disability which can best be overcome by placement in the resource room. Placement must be approved by the Director of Special Education of the Area Education Agency in which the student lives.

The resource room teacher is responsible for the design and delivery of educational intervention strategies and activities designed to help the student overcome or cope with his disability. Generally this involves the use of individualized educational plans utilizing specialized methods and materials. Altered classroom structure, especially involving the use of small group and individualized instruction, is an essential part of the resource room. The intervention strategies and activities are always geared toward the goal of helping the student overcome or cope with his disability or academic deficit

so he can successfully participate in the regular classroom with as little resource instruction as possible.

Population

The population in this study consisted of two students who attended a rural Iowa elementary school with a total student population of 275 students. Both students attended the resource room program seventy minutes daily. Both attended the room with two other students, but each subject worked on independent, not group, work.

Ann was a fourth grader. She was staffed as emotionally disturbed and learning disabled in the fall of 1976. She attended a residential self-contained with integration program from January 1977 through May 1978. In September 1978 she was transferred to the resource room program which she currently attends. A restaffing at that time indicated that she could handle regular fourth grade instruction if given resource help.

The most recent psychological testing for Ann was done in February 1978. On the WISC-R she received a full scale score of 85 with scores of 91 on the verbal scale and 78 on the performance scale. This placed her in the low average ability level. On the Peabody Individual Achievement Test given at the same time she scored third grade seventh month on the math subtest, third grade third month for reading recognition, second grade eighth

month for spelling, fourth grade zero months for general information, and third grade fourth month for the total battery. Since grade placement at that time was third grade six months spelling was found to be the only area in which she was significantly below grade placement. The restaffing in 1978 indicated that even though Ann had the skills to do normal fourth grade work, with the possible exception of spelling, other factors interfered with her actual classroom performance. These included an inability to accurately understand written and oral directions and a lack of confidence which had led to overdependency on the teacher and the inability to work independently. The staffing team also indicated that resource room instruction should deal with mathematical processes and concepts in addition to spelling.

Socially Ann had been described in psychological reports and by her classroom teachers as "cooperative", "anxious", "dependent", and "socially unaware." She would "constantly verbalize her every thought" and "didn't recognize that many of her own socially inappropriate actions were causing her to be disliked by other children." She would complain that even simple assignments were too hard. She usually demanded immediate help or daydreamed rather than attempt problems she was even a little unsure of.

Bob was a fifth grader whose chronological age at the beginning of the study was 128 months. He lived on a farm with both natural parents and several older brothers and sisters. Bob was of normal physical health. He was staffed as learning disabled and emotionally disturbed in the fall of 1977 and placed in the resource room which he currently attends.

A complete academic and psychological testing was completed in the fall of 1977. On the WISC-R he received a full scale intelligence quotient score of 104 with scores of 106 on the verbal scale and 102 on the performance scale. This placed him in the average ability level. On the Wide Range Achievement Test he received a score of fifth grade one month on the reading subtest, fourth grade seventh month on the spelling and third grade sixth month on the arithmetic subtest. A Key Math Test, given at the same time, indicated a grade equivalent of fourth grade three months. Since the subject's grade placement at that time was fourth grade third month only math was significantly below grade level. However, the staffing team also noted that an inability to accurately transfer verbal knowledge and problem solving abilities into correctly finished written problems and family tensions were hampering his ability to finish work at school.

Socially Bob had been described in psychological reports by his teachers as being "easily upset," "seeing the world as very threatening," "likely to withdraw and become submissive when threatened," and "constantly ignoring social rules." His classroom teacher reported that he could "sit and daydream all day if not constantly reminded to keep on task."

Specification of Variables

The dependent variables in this study were the number of problems completed and the number of disruptions made by the students each day. The range of possible scores for each variable each day was from none through an infinite number. The independent variable was whether tasks were assigned in random or fixed order as defined previously.

Procedures

Delineation of Assignments. Prior to the start of the experiment ten reading, mathematics, and language assignments were delineated and two hundred fifty unknown spelling words were found for each subject. All assignments were chosen from areas which the subjects had received previous classroom instruction, but which they hadn't mastered. Areas in which subjects had previous experience were chosen so that introducing them at the time of the study, spring 1979, would not complicate the

experiment unnecessarily. They were also chosen because they are basic skill areas which are frequently taught in the resource room. Activities were chosen from areas in which the subjects would not be studying in any other class during the experiment to avoid any possible confounding of the study.

Selection of spelling words was determined by a pretest of words in the subject's individual spelling program. The teacher dictated each word in the lists following the last one the subjects had completed in the resource room prior to the experiment. Dictation ended when the teacher counted two hundred fifty mistakes for each student. These words were used for the spelling assignments during the experiment.

The reading, mathematics, and language assignments were set up to repeat every tenth day throughout the entire experiment. For example column addition was taught on day one of each phase. Using this procedure subjects received instruction in specific areas one ten minute period every two weeks. This was done to prevent confounding the study because of mastery of assignments and to keep the assignments across the phases as identical as possible. A visual representation of the assignments is as follows.

Table I

Visual Representation of Assignments for This Experiment

Day	Assignments		
	Math	Language	Reading
1	Column Addition	Alphabetizing	Using the Context
2	Subtraction	Quotation Marks	Locating the Answer
3	Multiplication	Capitalization and Punctuation	Getting the Facts
4	Division	Plural Forms	Getting the Main Idea
5	Story Problems	Homonyms	Drawing Conclusions
6	Money	Parts of Speech	Working with Sounds
7	Fractions	Possessives	Following Directions
8	Measurement	Use of Comma	Understanding Questions
9	Converting Measures	Writing Letters	Understanding Word Groups
10	Time	Prefixes and Suffixes	Recognizing Word Relationships

Comparable items, defined as those using similar problem solving processes and equal numbers of errors, but different words or numbers, were constructed for each type of math, language, and reading assignment. For example, the four column addition assignments for day one of each phase were constructed comparably, the four subtraction assignments for day two of each phase were constructed comparably, and so forth. Since new spelling words were used each day this procedure was not necessary for the spelling assignments.

Description of Assignments. The skill areas and specific assignments were as follows. Sample problems can be found in the appendix. The students correctly completed as many problems as they could in a ten minute time limit. Variances in assignments between Subject A and Subject B were due to the different instructional and grade levels of the students.

Mathematics. Specific mathematics assignments were as follows.

Day one of each phase. Column Addition. Subject A completed two digit three number problems. Subject B completed three digit three number problems.

Day two of each phase. Subtraction with Borrowing. Subject A completed three digit problems. Subject B completed four digit problems.

Day three. Multiplication. Subject A completed two digit by one digit problems while Subject B completed three digit problems.

Day four. Division. Subject A completed two digit divided by one digit problems while Subject B completed five digit divided by two digit problems.

Day five. Story Problems. Subject A completed story problems involving a one step process and either addition or subtraction. Subject B completed story problems involving a one step process and addition, subtraction, multiplication, or division.

Day six. Money. Subject A correctly wrote the amount of money contained in stacks of coins amounting in each case to less than one dollar. Subject B correctly wrote the amount of money contained in stacks of coins and bills amounting in each case to less than ten dollars.

Day seven. Fractions. Given a graphic representation of a proper or improper fraction Subject A wrote the correct fraction in numerical form. Subject B correctly subtracted fraction problems involving conversion to like fractions, regrouping, and reducing.

Day eight. Measuring. Subject A correctly measured lines to the nearest quarter inch and wrote the measurements in correct numerical form. Subject B

correctly measured lines to the nearest eighth inch and wrote the measurements in correct numerical form.

Day nine. Converting Measures. Subject A correctly converted measurements involving inches, feet, and/or yards. Subject B correctly converted measurements involving cups, pints, quarts, half gallons, and/or gallons.

Day ten. Time. Subject A answered correctly problems involving the passage of hours and half hours such as "If it is 8:00 now what time will it be in five and one half hours?" Subject B correctly answered problems of the same nature but was also required to label his answer with a.m. or p.m. and the proper day.

Language. Specific language assignments for each of the phases were as follows.

Day one of each phase. Alphabetizing. Subject A alphabetized groups of ten words each in which the initial letters were different. Subject B alphabetized groups of ten words in which any letters were alike or different.

Day two of each phase. Quotation Marks. Subjects A and B both completed the same assignments. These consisted of placing quotation marks around direct

quotations of spoken words.

Day three. Capitalization and Punctuation. Subject A identified and corrected errors involving the capitalization of sentence beginnings and names of people and the punctuation of sentence endings. Subject B corrected errors involving the capitalization of sentence beginnings, names of people, names of places, months and days, and the punctuation of sentence endings, common abbreviations such as Mr. and Mrs., and punctuation involved in writing dates and addresses.

Day four. Plurals. Subject A correctly wrote the plurals of words in which an 's' or 'es' is added and of words where the ending 'y' changes to 'i' before adding 'es'. Subject B correctly wrote plurals of these words and also those where 'f' changes to 'v' and irregular plurals are formed such as 'mice' for 'mouse'.

Day five. Homonyms. Subject A chose the correct homonym in sentences using 'to', 'too', and 'two' or 'their' and 'there'. Subject B correctly chose the proper homonym for sentences using several common homonyms. A complete list of these homonyms can be found in the appendix.

Day six. Parts of Speech. Subject A correctly

underlined all nouns in lists of sentences. Subject B correctly underlined all nouns and circled all verbs in lists of sentences.

Day seven. Possessives. Subject A correctly wrote the singular and plural possessive form of words with plurals formed by adding 's' or 'es' or changing 'y' to 'i' before adding 'es'. Subject B correctly wrote the singular and plural possessive form of words which form plurals by adding 's' or 'es', changing 'y' to 'i' or 'f' to 'v', or in an irregular pattern such as 'mouse' to 'mice'.

Day eight. Use of Comma. Subject A correctly inserted commas into sentences which contained lists of items. Subject B inserted commas into sentences containing lists, cities, and states, or dates.

Day nine. Letter Writing. Subject A correctly placed the proper punctuation into letter headings. Subject B placed the proper punctuation in letter headings, greetings, and closings.

Day ten. Prefixes and Suffixes. Given words which contain both a prefix and a suffix both subjects correctly identified all prefixes and suffixes.

Reading. The Specific Skills Series was chosen because of the uniformity assignments it allows. Specific reading assignments were as follows.

Day one of each phase. Using the Context. Subject A completed units from the C level book while Subject B completed units from the D level book.

Day two of each phase. Locating the Answer. Each subject completed work from the C level book.

Day three. Getting the Facts. Subject A completed units from the C book while Subject B completed units from the D level book.

Day four. Getting the Main Idea. Subject A completed work from the C book while Subject B completed units from the D level book.

Day five. Drawing Conclusions. Subject A completed units from the C level book. Subject B completed units from the D level book.

Day six. Working with Sounds. Both subjects worked in the D book.

Day seven. Following Directions. Both subjects worked in the D book.

Day eight. Understanding Questions. Both subjects completed work from the D book.

Day nine. Understanding Word Groups. Both subjects worked in the D level book.

Day ten. Recognizing Word Relationships. Both subjects worked in the Basic Level book.

Spelling. The students practiced five review and as

many new words as they could in a ten minute span. The review words were always the last five words learned as new words the previous day.

Daily Procedures. At the beginning of each task the teacher made a comment such as "Go to the board. It is time for spelling." For math, language, and reading a sample problem was given and worked jointly by the teacher and the subject. The assignment was then given to the subject. Since students had been given previous instruction in all skill areas a detailed formal period of instruction to each task was not needed. However, during any part of the instructional period, including the timed phase, the teacher gave any help requested by the student and answered any questions except if the subject asked directly for the answer to a problem.

For spelling no sample problem was given. Timing began as soon as the teacher dictated the first spelling word. Students spelled each of five review words. After each word the teacher provided verbal feedback as to accuracy. If the word was correctly spelled the student progressed to the next word. If incorrect the student corrected it. He then started over and respelled correctly all previously spelled words as well as the incorect one before progressing on to the next word. When all five review words were correctly spelled in sequence the

subject learned as many new words as time allowed using the same procedure. At the end of the time limit the teacher instructed the student to stop, collected the assignment, and introduced the next assignment.

Research Design

In this study a single subject reversal design was employed.

Single Subject Research Designs. The use of single subject designs has increased in the past few decades. Growing from an awareness that group research designs are not always appropriate or valid in predicting individual behaviors they are slowly gaining the acceptance of the research community. Dukes (1965) for instance found 246 single subject studies dating from 1940 through 1965. Other authors (Baer, Wolf, and Risley, 1968; Bijou, Peterson, and Ault, 1968; Goldiamond, Dyrud, and Miller, 1965; Gottman, 1973; Kazdin, 1973; and Sidman, 1960) have described and advocated the use of single subject designs. The Journal of Applied Behavior Analysis, established in 1968, was set up solely to publish single subject research. Single subject designs seek to demonstrate changes made by an individual over time in the presence or absence of an experimental variable. This contrasts with between group approaches which seek to demonstrate group differences. However, the single subject research design

is not an attempt to downgrade traditional group research designs. Rather it supplements the research field with new methods which are more appropriate when dealing with individual behaviors.

The Reversal Technique. The reversal technique has also been called the ABAB technique, intrasubject replication design, equivalent time samples, and the intensive design. In this design a behavior is measured over time until its stability is clear. The experimental variable is then interjected. Behavior continues to be measured to see if the variable produces behavioral change. If the behavior does change the experimental variable is dropped after a period of time, but behavior continues to be measured. This allows the researcher to see if the behavioral change is a result of the experimental variable or of some other independent variable. If the change is a result of the experimental variable the changes in behavior noted during the experimental phase should revert back towards the pre-experimental phase pattern. If the change is not a result of the experimental variable the behavior should not revert, but should remain constant or increase. If behavior does revert during this phase it is then necessary to reintroduce it after a period of time. The reintroduction of the experimental variable must result in behavior increases such as those found during the

first experimental phase for the change to be considered due to the interjection of the experimental variable. If the desired behavior doesn't increase in each of the experimental stages and decrease in each of the reversal stages no conclusions can be drawn. Presentation, removal, and representation may be done any number of times. Behavior is considered the result of the experimental variable when it consistently increases when the variable is applied and decreases when it is removed.

Advantages and Disadvantages of Single Subject Reversal Designs. These designs have several advantages. First, such research is important where control groups cannot be found. As Kazdin (1973) notes:

> with relatively few exceptions...subjects cannot be matched and assigned randomly to classes, hospital wards, institutional settings, or classrooms in which the procedure will be evaluated (p. 526).

Secondly, group designs deal with group means. This often is inappropriate when dealing with the effects of a variable on an individual subject. The trend of the whole group may be quite irrelevant to an individual's behavior. Single subject designs also allow exploration of behavioral change over a period of time, whereas group designs usually do not. Gottman (1973) illustrates this by stating that often "old habits must be unlearned be-

fore new habits are acquired" (p. 98). A group design could not show such changes, but would record only the behavior at one point in time along the process whereas a single subject design could show the whole array of change. Finally, the essential ingredient in the design, the reversal condition, has been found to be quite powerful in ruling out alternative explanations that could account for behavioral changes thus increasing the validity of the research study.

However, these designs also have several disadvantages. Probably the biggest disadvantage is that results cannot easily be translated into general statements of behavior. Since a limited number of subjects are involved it is quite possible that the results are unique to the person(s) involved and the circumstances of the particular study. Although hypotheses about behavior may be generated from such studies they remain at best unproven guesses when used in different settings or with different children. However, since group designs measure averages of behaviors of a whole group their application to individual subject's behaviors too is at best an estimate. Two problems also arise from the reversal condition. It may be of questionable ethics or even impossible to have behavior revert back once it is changed. If the desired outcome is to increase positive behavior

and/or decrease inappropriate behavior is it ethical to bring back a decrease of appropriate behavior or an increase of inappropriate behavior? Also, some behaviors, such as mastery of cursive writing, are relatively permanent and cannot be reversed. Secondly, since this design deals with reversals of behavior only transitory changes can be examined and permanency of change cannot be proven.

Validity of this Design. Internal validity refers to the degree to which the experiment's results are due to the experimental manipulation. To assure internal validity it must be shown that no design factor other than the experimental variable accounts for the results of the experiment. Campbell and Stanley (1963) note that the reversal design is quite strong with respect to internal validity because such factors as events occurring in time, growth or mastery, selected subject loss, and performance slips due to unreliability of measurements do not influence them. However, there are problems which need to be dealt with. Any factor, such as giving different instructions in different experimental phases can cause behavioral differences due to the factor itself, not due to the intervention. Another major factor is that the experiment's administrator could easily change behavior from phase to phase resulting in student changes

due to the administrator's behavior change, not the experimental variable.

Several things were done in this study to ensure internal validity. First, the general class routine was analyzed so that pre-experimental and experimental conditions were as identical as possible. This was done to minimize new experimental conditions which could influence the results. It was also done because teacher and student behavior was more likely to be similar from day to day with a daily routine which they were accustomed to and understood. These variables included all of the following.

(1) The general room rule that all students were expected to work independently without bothering other students was continued.

(2) All students in the resource room during experimental periods arrived and left at the same time each day.

(3) No students except each target child and the two others who had come with the target child all year were present in the room during experiment times each day.

(4) The type of assignment and spelling routine used before the experiment was continued in the experiment.

(5) The teacher for the experiment had taught the

class all year and had customarily given praise for task oriented behavior and correct work, had checked problems periodically while students worked, had expected one hundred percent accuracy, and had encouraged students to work without punishing or threatening.

(6) The students were used to having a male observer who always sat at the teacher's desk so a male was chosen to be the observer for the experiment. He sat at the teacher's desk.

Despite this, special guidelines did need to be set up for all persons in the study. Because proximity to other students and the teacher can influence student task completion and disruptions students were assigned seats throughout the experiment. The target subjects always sat to the right of the teacher while the other students sat directly across from the teacher. The teacher was instructed to make all marks on the data sheet as inconspicuous as possible so subjects would not change any behaviors because of them. She was also requested not to look back at any completed data sheets except after the twentieth and forthieth days because this could have subconsciously changed her behavior towards the target students. The observer was told to be as inconspicious as possible and to ignore any student behaviors directed

at him. All these guidelines were effectively accomplished during the experiment.

In addition to these guidelines the academic tasks, graphing procedures, and research design were also set up eliminate external variance. As discussed previously assignments were repeated every ten days and were constructed using similar numbers and types of errors to ensure equality of assignments across phases and to prevent mastery of assignments. In graphing data an average of problems completed and disruptions made in each phase was obtained and was graphed using a dotted line on all three graphs. This helped minimize the effect which any one day might have had on the experimental outcome and made visual analysis easier. In addition, the phases themselves were equalized using two procedures. First, as discussed previously, repeating the type of assignments each ten days ensured that each day of each phase was identical. Secondly, to help overcome problems specific to any particular day or phase one student started the experiment with the Fixed I phase while the other started with the Random I phase. This resulted in having one subject working in a random phase and the other working in a fixed phase for each of the forty experimental days. While any extraneous variable could have affected a student's individual performance it would not have affected

the cumulative data of either condition more than the other. A log was also kept for each student detailing any unusual circumstances which occurred and could have influenced study results.

Specific Design for This Study. A single subject reversal design was chosen for this study for two reasons. First, because of the nature of the resource room random sampling is not possible. Children are not randomly assigned to the room but are specially chosen because of specific learning or behavioral problems. Secondly, by using this design the focus of attention can be drawn to the subject's individual behaviors not group behaviors. Since resource settings are comprised of groups of usually not more than three to four children and since each child must be working on individual, not group, goals attention on individual behavior is more appropriate than attention to group variance.

The present study consisted of four phases. Each phase lasted ten days for a total experiment time of forty days. Days ran consecutively. Neither subject was absent from school during the experiment. The phases were as follows.

Fixed I. During this phase the four tasks were presented each day in a fixed order. This order was: 1) math, 2) language, 3) reading, and 4) spelling.

The activities were written on the board. The students were told they would do each of them in the order presented. Students were given verbal praise for problems completed and non-disruptive behavior. The number of problems completed was recorded as soon as each ten minute period was over. Disruptions were continuously recorded. Additionally, whenever the teacher noticed that a subject had not worked on an assignment for thirty seconds the teacher reminded the subject to continue working but did not threaten or punish the student.

Random I. In this phase all four tasks were presented in a predetermined random order with one being the math task, two the language task, three reading, and four spelling. The order of activities for each day was determined by drawing cards with a number from one through four on them from a hat. The first number chosen was the first task to be done that day, the second was the second task to be done, and so forth. The four cards were replaced, reshuffled, and redrawn for each day. The order of activities was as follows.

Day 1: 4,2,3,1

Day 2: 2,3,4,1

Day 3: 3,1,2,4

Day 4: 1,2,3,4

Day 5: 4,3,1,2

Day 6: 1,3,2,4

Day 7: 2,3,4,1

Day 8: 4,3,2,1

Day 9: 3,2,1,4

Day 10: 1,2,3,4

Students were told they would do each activity but not necessarily in any order. Verbal praise was given for problems completed and non-disruptive behavior. The number of problems completed was recorded as soon as each ten minute period was over. Disruptions were continuously recorded. In addition, whenever the teacher noticed that a subject had not worked on an assignment for thirty seconds the teacher reminded the subject to continue working but did not threaten or punish.

Fixed II. This phase was a return to all conditions of Fixed I.

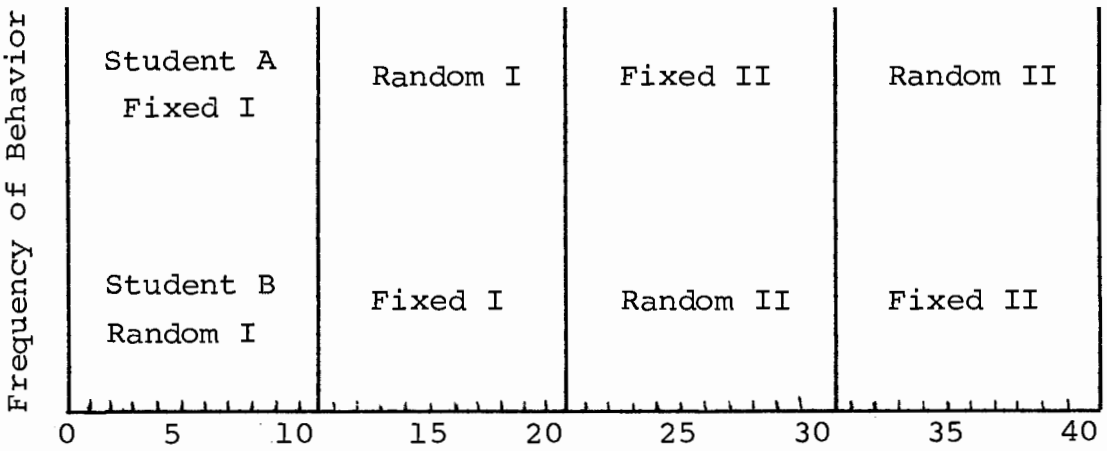
Random II. This phase was a return to all conditions of Random I.

A graphic representation of the research design is shown below. The X axis details each of the forty days of the experiment. The Y axis denotes frequency of behavior for both task completion and disruptions. Three graphs

were compiled. A separate graphic representation was made for each student. A third graph was made for the students' cumulative responses.

Graph I

Graphic Representation of this Research Design



Data Collection

Under all conditions the teacher collected data on a standardized score sheet which included the day of the experiment, the four tasks, and the student's name. Timing began after instructions for each task were given and the worksheet was passed out. As soon as the time limit for each exercise was up the raw number of completed problems was placed in the box directly below the task name. A checkmark was placed below the task completion box of the task the student was working on whenever a disruption occurred. A sample score sheet is included in the appendix.

To determine the extent to which the data could be

reliably recorded an independent observer, who had been familiarized with the instructions and the criteria for rating task completions and disruptions, sat in the classroom during two days of each phase selected at random and scored each student's behavior for each task. This observer had a separate score sheet. Percent agreement was computed as the number of agreements divided by the number of agreements plus disagreements between the teacher and the observer. To determine the extent to which the teacher and observer could agree on the recording of disruptions the observer and teacher recorded ten class sessions prior to the experiment. For those samples teacher and observer agreement was 92 percent.

Data Analysis

Analysis of data derived from single subject research studies has typically been accomplished through the use of two procedures. These are visual and statistical analysis. For this study visual analysis was employed. There were two reasons for this choice. First, visual analysis is a commonly accepted procedure for interpreting such data. Secondly as Kratochwill and Levin (1978) state "simple adaptation of conventional parametric techniques (eg: varieties of t-tests, analysis of variance, multiple regression) is not appropriate" (p. 316) for use in single subject designs.

Three sets of data were analyzed. First, each subject's data was analyzed individually for both the numbers of problems completed and the number of disruptions made. Then the combined scores for both students were analyzed. Each of the three sets of data was also analyzed in two different ways. The average scores, as shown by the dotted lines on the graphs, were used to determine overall study results. Next, Individual problem completion scores were analyzed. Because the daily assignments within each phase weren't comparable data on problem completions could not be analyzed on a day to day basis. However, since the comparable days of each of the four phases were equal in difficulty these were analyzed. Day one of phase one was compared to day one of phases two, three, and four for example. The information on disruptions was analyzed on a day to day basis.

Chapter 4

RESULTS

Teacher-Observer Agreement

For eight sessions an independent observer sat in on the experiment and recorded the number of disruptions made by each subject. Teacher-observer agreement was calculated as the number of agreements divided by the total number of agreements and disagreements. For Subject A the percentage of agreement ranged from 83 to 100 percent with an average of 92 percent agreement. For Subject B the percentage ranged from 83 to 100 percent with an average of 90 percent agreement.

Data Analysis of Subject A's Scores

Analysis of Phase Averages. The average number of problems completed and disruptions made by Subject A in each of the four phases is shown in Table II. During the Fixed II phase Subject A completed more problems and made fewer disruptions than in the two random phases. In Fixed I the subject also completed more problems than during the two random phases. However, while the number of disruptions made in Fixed I was less than the number of disruptions made in Random I it was not less than the number made in Random II. This may have been a result of external factors as described below. In general, though, the results do show that Subject A completed more

problems and made fewer disruptions when assignments were presented in fixed rather than random order.

Table II

Average Number of Problems Completed and Disruptions Made by Subject A

Phase	Problems Completed	Disruptions
Fixed I	49.9	11.3
Random I	35.7	14.5
Fixed II	45.6	6.8
Random II	34.0	10.9

Of interest when comparing scores across phases is that the number of problems completed in Fixed I and Random I was greater than the number of problems completed in Fixed II and Random II respectively. The same pattern is true of disruptions with disruptions higher in the first two phases than the last two. Had mastery of assignments occurred the subject would have been expected to complete more problems during the later phases. This shows that mastery probably didn't occur. Two possible variables could explain this trend. The novelty of the new experimental condition might have caused the subject to work harder at first, but less later on when the newness of the experimental condition wore off. Secondly,

it is a common pattern for students to produce less work as the end of the school year approaches. In both cases a lower number of disruptions would have been expected in the first two phases than the last two phases. This was not the case.

Analysis of Daily Problem Completion Scores. An analysis of daily scores also supports the finding that more problems were completed in the fixed phases than in the random phases. Table III shows that for seven of the

Table III

A Comparison of the Number of Problems Completed by Subject A Across the Phases

Day	Phase I	Phase II	Phase III	Phase IV
1	51	35	52	32
2	38	32	44	27
3	47	35	32	37
4	50	18	34	23
5	48	32	38	34
6	55	50	72	41
7	53	37	46	41
8	52	36	51	32
9	56	32	32	29
10	49	50	55	44

ten days the number of problems completed in the fixed

phases was greater than the number of problems completed in the two random phases. In day three, where the Fixed II score fell below the two random phase scores an environmental variable may have influenced the subject's performance. That day she was leaving town to visit relatives. She had excitedly told how anxious she was about this. No explanation can be given for the low scores in day nine of Fixed II and day ten of Fixed I.

Analysis of Daily Disruptions. Disruptions were analyzed on a day to day basis. As seen on Graph II the number of disruptions made on days one and two of Fixed I were much higher than the other days' scores. Getting accustomed to experimental conditions could account for the high number of disruptions made these days as several disruptions involved inappropriate questions regarding what we were doing. The number of disruptions declined from days three to seven followed by a sharp increase for days eight to ten. No explanation other than log notations regarding snowy weather can be found.

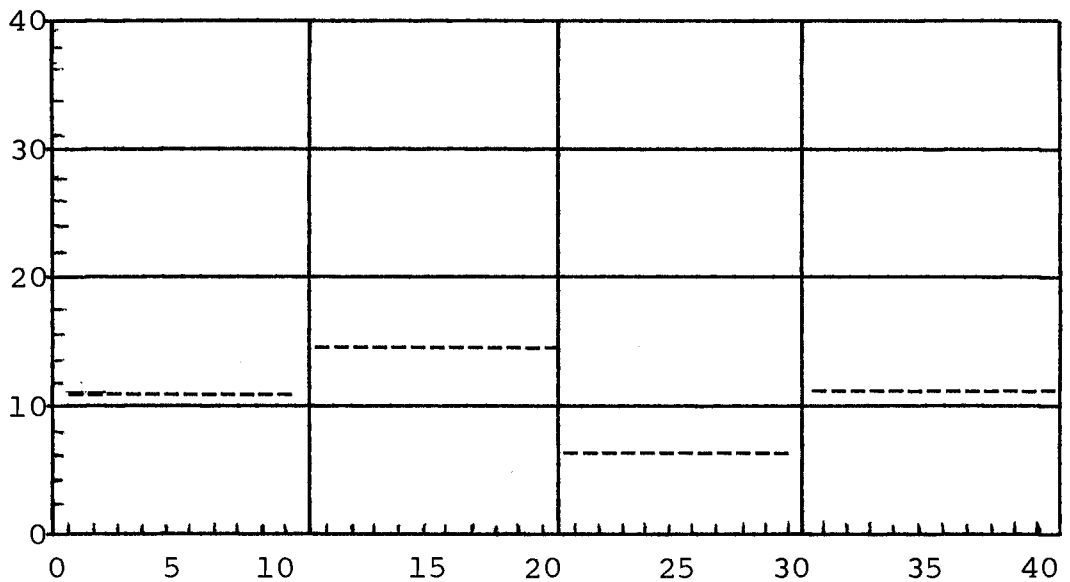
There was little break in scores from phase one to phase two which could have discounted the idea that change was due to the experimental variable. However, the dividing scores between phases two and three and between phases three and four did show abrupt changes thus offsetting the score overlap of the first two phases. Dis-

ruption scores for phase two were fairly consistent with a drop noted on day seven. All four study participants, including the teacher and the subject, had bad colds that day which could account for the drop.

Graph II

Graphic Representation of Subject A's

Daily Disruption Scores



No consistent pattern could be found for phase three's scores. Although stable for days one through four disruptions then alternated sharply for the remainder of the phase. No log data accounts for this. However, even with these variances the scores were still consistently lower than the scores of Random I.

Scores in Random II were consistent except for day

forty which was somewhat higher. Since this was the first day of the last week of school this increase is easily understood.

These results show that for the most part the analysis of daily disruption patterns does support earlier results showing that disruptions were higher in the random conditions than during the fixed conditions.

Data Analysis of Subject B's Scores

Analysis of Phase Averages. The average number of problems completed and disruptions made by Subject B in each of the four phases is shown in Table IV. In each of the two fixed phases the subject completed more problems and made fewer disruptions than during the two random phases. Similarly to Subject A's data more problems

Table IV

Average Number of Problems Completed and Disruptions Made by Subject B

Phase	Problems Completed	Disruptions
Random I	41.2	24.5
Fixed I	50.1	8.2
Random II	36.4	18.6
Fixed II	48.9	9.1

were also completed in Random I and Fixed I than in Random II or Fixed II tending to discount the theory that mastery could have taken place. Again the approaching end of the school year or conditioning to experimental conditions could have been factors tending to reduce the number of problems completed. However, disruptions did not rise significantly in the later phases as would have been expected with these explanations. Thus, the changes in the phases do appear clearly to be the result of the interjection of the experimental variable.

Analysis of Daily Problem Completion Scores. The Individual analysis of problems completed for Subject B is not as clear as with Subject A. In five days both fixed phase scores were greater than the two random phase scores, as shown in Table V. However, in five days the scores in Random I were greater than or equal to the Fixed II scores. Since all other analyses of these days (comparing Fixed I with both random phases and comparing Fixed II with Random II) with the exception of day fourteen were consistent and because each case involved the first ten and the last ten experimental days it could have possibly been that the discrepancy was caused either by an increased number of problems completed at the beginning of the experiment due to the newness of the experimental conditions or to an end of the year "slump". Day fourteen's

scores could be attributed to the fact that it was the last day before Easter vacation. If these variables can account for the discrepant behaviors the findings become quite consistent with the results found from the phase averages.

Table V

A Comparison of the Number of Problems Completed by Subject B Across the Phases

Day	Phase I	Phase II	Phase III	Phase IV
1	43	44	38	39
2	41	54	36	65
3	31	36	18	33
4	46	42	37	46
5	43	54	28	52
6	38	62	51	54
7	31	41	36	52
8	57	62	35	50
9	40	41	36	40
10	42	65	49	58

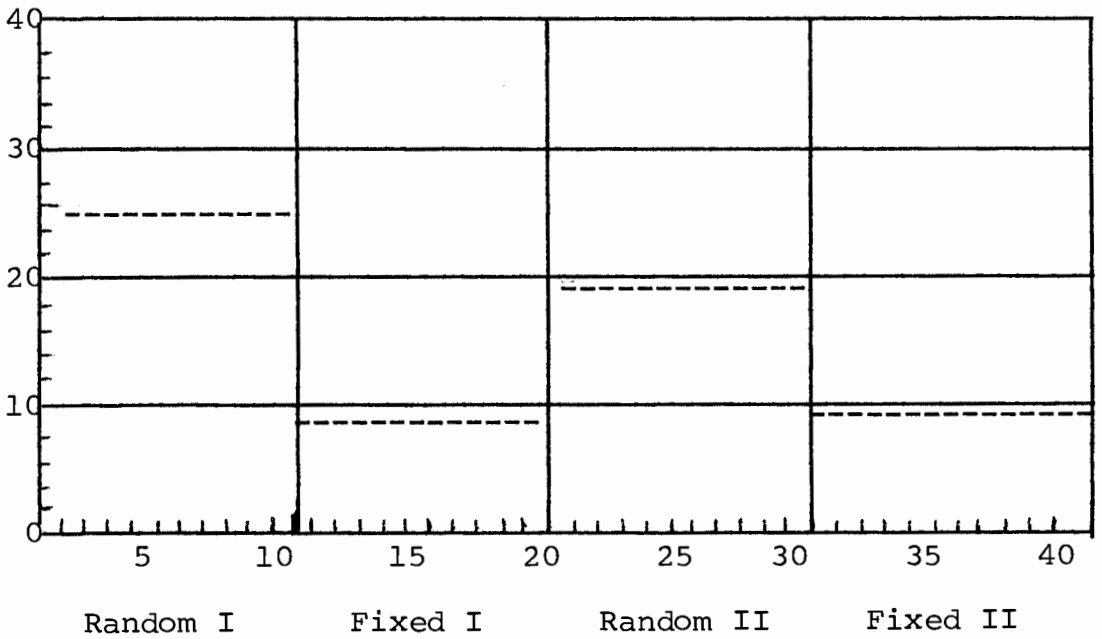
Analysis of Daily Disruptions. The pattern of Subject B's disruptions is not as clear as with Subject A's data, as can be shown in Graph III. Several environment-

al factors influenced the scores of the first phase. On days two, four, seven, and eight one of Subject B's partners was disrupting the class more than usual which could have influenced his disruption rate. On day six there was a heavy snow storm outside. On day ten he had just returned from participating in a class play and was excited about that. Thus, the first phase's scores are likely to be inflated. However, even the scores of days one, three, five, and nine, where no external factors were noted, were much higher than the scores of the two random phases.

Graph III

Graphic Representation of Subject B's

Daily Disruption Scores



A good break from day ten to eleven helps support the

environmental variable's importance and is followed by decreased disruptions even though day fourteen was the day before Easter vacation and a tornado drill occurred between assignments on day fifteen. No log data is available to help interpret day eighteen's and nineteen's high scores.

Another good break is shown between phases two and three with fairly high scores shown for all phase three. Again there is no pattern for this phase's scores nor any log data to help explain variances. However, the scores still are considerably higher than those in the fixed phases.

The last disruption score of phase three and the first score of phase four were equal. This would tend to decrease the importance of any conclusions drawn from the drop in disruptions between phases one and two and the increase in disruptions between phases two and three. Scores in phase four were relatively constant except for a decrease on day thirty-five. Since the subject had just finished his part in a school music program prior to coming to the resource room higher disruption scores would have been expected.

Overall, with a few exceptions, the day to day data analysis supports the results found by comparing phase averages which is that the number of disruptions made by

Subject B decreased during the fixed phases and increased during the random phases.

Analysis of Combined Scores

Analysis of Phase Averages. The average number of problems completed and disruptions made by both subjects in each of the four phases is shown on Table VI. The results are very dramatic. During the two fixed phases the

Table IV

Average Number of Problems Completed and Disruptions Made by Both Subjects

Phase	Problems Completed	Disruptions
Random I	76.9	39.0
Fixed I	100.0	19.5
Random II	70.4	29.5
Fixed II	94.5	15.9

subjects collectively completed more problems and made fewer disruptions than during the two random phases. As with both subjects' individual scores the number of problems completed and disruptions made was less in the later two phases than the first two phases, which helps discount the idea of assignment mastery.

Analysis of Daily Problem Completion Scores. Problem completion scores across phases is shown in Table VII. This indicates that in nine of ten days the problem completion scores for the fixed phases were greater than the scores of the random phases. On day nine while the

Table VII

Comparison of Problem Completion Scores for Both Subjects Across Phases

Day	Random II	Fixed I	Random II	Fixed II
1	78	95	70	91
2	73	92	63	109
3	66	83	55	65
4	64	92	60	80
5	75	102	62	90
6	88	117	92	126
7	68	94	77	98
8	93	114	67	101
9	92	97	65	92
10	92	114	93	113

Fixed I score and the Fixed II score were greater than the Random II score the Fixed II score only equaled the Random I score. Day nine was unusual for both Subject A and Sub-

ject B individually. While it could have been due to the end of year "slump" for Subject B no explanation could be found for Subject A's score. However, since all scores except this comparison do follow a consistent pattern it can be concluded that the subjects did comparably more problems when tasks were assigned in fixed order.

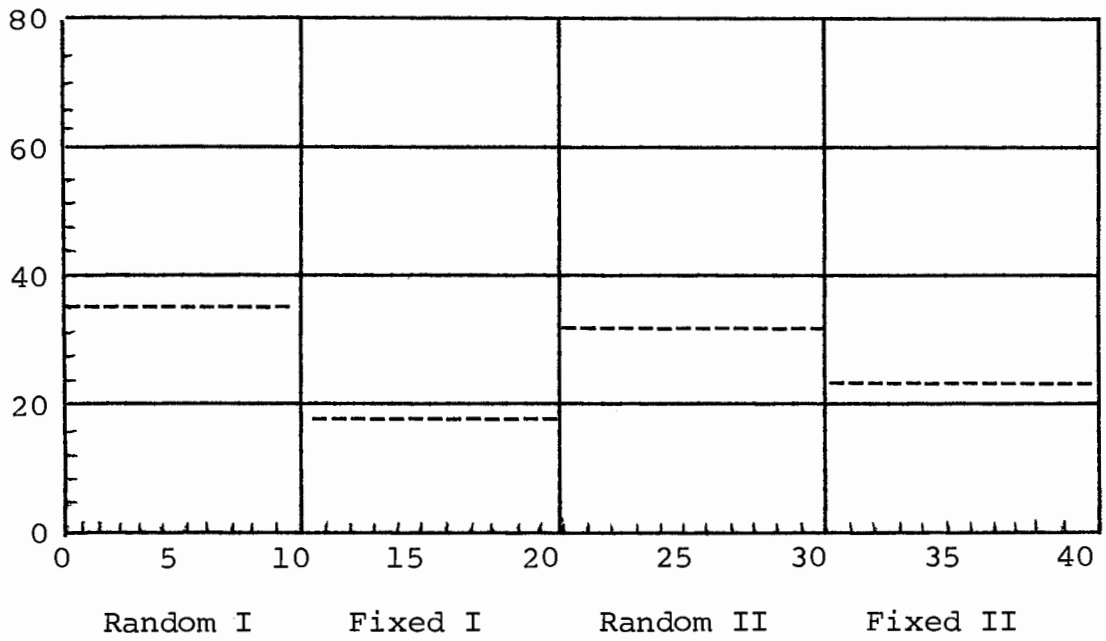
Analysis of Daily Disruptions. The number of disruptions made by the subjects in Random I shows a pattern of increasing disruptions throughout the phase with the exception of days six and seven, as can be seen in Graph IV. Day six's extremely high score could be attributed to the increase in disruptions made by Subject B that day possibly because it was snowing heavily. Day seven was influenced by Subject A's low score which could have been the result of a bad cold which she and the teacher had.

A good break is seen from Random I to Fixed I helping to support the effectiveness of the experimental variable. The increase in day two of Fixed I could be due to the excess number of inappropriate questions made by Subject A that day about the new procedures and/or because Subject B made more disruptions because of his partner was being more disruptive than usual. The increase on days six, eight, and nine can't be explained using log data other than it was snowing out those days for Subject A. However, even on those days the number of disruptions

Graph IV

Graphic Representation of Both Subjects'

Daily Disruption Scores



made was not greater than the number of disruptions made for any day of the two random phases indicating a definite drop in disruptions for the whole phase.

Another strong break occurs between Fixed I and Random II supporting the experimental variable's importance. No pattern can be found for the scores made during this phase. However, all phase scores are greater than all but three scores in either of the fixed phases showing a definite increase in disruptions for the entire phase.

A slight break in the scores is shown between Random II and Fixed II. Scores of Fixed II are relatively stable

ranging from fifteen to 21 with the exception of very low scores on days 35 and 37. All these scores are lower than all random scores.

In conclusion, each phase's scores indicate that the combined number of disruptions made by the subjects was consistently higher in the random phases and lower in the fixed phases.

Summary

Each of the six analyses indicate that in both the fixed phases the number of problems completed by the subjects was greater than the number of problems completed in the random phases. Also, the number of disruptions made in both fixed phases was less than the number of disruptions made in the two random phases. These results were consistent for both subjects individually and for the combined data.

Chapter 5

SUMMARY

This study was undertaken because of the dramatic upswing in the number of resource classrooms and students in the last decade and the lack of research regarding these students in the resource room setting. Teachers have assumed that research studies dealing with regular classroom practices or with other specialized populations were also appropriate for this new kind of student and setting. However, the regular classroom is not identical to the resource class. The resource class student is not necessarily like any other special student either. Only after the behavior of resource room students has been thoroughly investigated in the resource room setting can we be sure that we are employing appropriate methods to teach these students.

The population of this study was two elementary students who attended a rural northeastern Iowa elementary school with a total student population of 275 students. The girl, a fourth grader, and the boy, a fifth grader, had both been staffed as learning disabled and emotionally disturbed. Both had attended the resource room seventy minutes daily with two other subjects, but each had worked on independent work.

A single subject reversal design was employed. This

design was chosen because random sampling was not possible due to the nature of the resource room. It also allowed the focus of attention to be drawn to the subject's individual behavior, not group behavior. Since resource settings are comprised of groups of usually not more than three to four children and since each child must work on individual, not group, goals attention to individual behavior was more appropriate and desirable.

The study itself consisted of four phases. Each lasted ten days for a total experimental time of forty days. In each of the days students completed ten minute math, language, reading, and spelling assignments. The math, language and reading assignments were designed so that students received comparable assignments for each day of each phase. For example, the assignments for day one of phase one were comparable to the assignments for day one of phases two, three, and four. This procedure was not necessary for spelling because different words were used for each of the forty days. During each class period the teacher, and periodically an independent observer, continuously recorded all disruptive physical actions and noises made by the subjects. At the end of each class period the teacher recorded the number of problems completed by the students. This information was used to determine differences between the two experimental condi-

tions.

The phases themselves differed only in whether the daily assignments were presented in fixed or random fashion. In phases one and three Subject A's assignments were presented in fixed order. This meant that they were presented in the same order each day throughout the phase. During phases two and four the four assignments were given in a predetermined random order. Subject B, conversely, received his four assignments in random order for phases one and three and in fixed order for phases two and four.

Three sets of data were analyzed. First, each subject's scores were analyzed individually. Then the combined scores for both subjects were analyzed. Each of the three sets was analyzed using phase averages, individual problem completion scores, and the disruption scores. Phase averages were used to determine overall study results. Because the daily assignments within each phase weren't comparable individual problem completion scores could not be analyzed on a day to day basis. Since the comparable days of each of the four phases were equal in difficulty these were analyzed. Day one of phase one was compared to day one of phases two, three, and four. Finally, the data on disruptions was analyzed on a day to day basis.

In each of the six analyzes the number of problems

completed by the subjects in the fixed phases was greater than the number of problems completed in the random phases. Also, the number of disruptions made in both fixed phases was less than the number of disruptions made in the two random phases. These results were consistent for both subjects individually and for the combined data.

The evidence from this experiment definitely indicates that assigning tasks in a fixed rather than a random order does increase the number of problems completed and decrease the number of disruptions made by resource room students in a resource room setting. Resource teacers should be aware of this and consider implementing a daily fixed order of assignments, especially with children who are exhibiting problems with task completion or with disruptions.

This study still leaves some questions unanswered. While effective with a particular type of assignments and a particular type of problem behavior would the results be found when using other types of assignments or with other types of problem behaviors? This study also focuses solely on independent work. Would it be effective when used with small groups which are also common in the resource room? These areas need to be investigated further to determine whether assigning tasks in a fixed

rather than a random order can also be effective under those conditions with those types of problems.

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Appendix

APPENDIX A

Sample Problems--Mathematics

Task	Subject A	Subject B
Column Addition	38 49 85	146 385 476
Subtraction	908 -381	4000 -3865
Multiplication	48 x8	395 x853
Division	$3\overline{)81}$	$72\overline{)49381}$
Story Problems	Mark counted 24 blue jays, 86 sparrows, and 32 robins. How many birds did he see?	Mark counted 185 birds in 5 days. How many did he see each day?
Money	25 5 5 1 =_____ (use real coins)	5 1 50 25 1 =_____ (use real coins)
Fractions	=_____	2 5/8 -1 6/7
Measurement	_____ = _____	_____ = _____
Converting Measures	If there are 3 feet in a yard, how many feet are in 3 yards?	If there are 8 pints in a gallon, how many pints are in 6 gallons?
Time	If it is 8:00 now what time will it be in five hours?	If it is 8:00 Monday evening what time will it be in five hours? _____, _____, _____ hour a.m. day ½.m.

APPENDIX B

Sample Problems--Language

Task	Examples
Alphabetizing	Alphabetize these words by placing a '1' before the word which comes first, a '2' before the word which comes second, etc.

Subject A	Subject B
___mister	___sand
___garden	___sample
___cotton	___scraps
___root	___bags
___tree	___saddle
___valentine	___seam
___stocking	___knife
___horse	___baggage
___forest	___school
___lamb	___sandbox

Quotations	Place quotation marks where needed in each sentence.
	Both subjects: Jackie said I go to Waterloo sometimes.
Capitalization and punctuation	Place capital letters and punctuation marks where needed.
	Subject A: stacey said that susan went to cutshall park
	Subject B: her address is 1445 west fourth street
Plurals	Write the correct plural for these words.

Subject A	Subject B
lily_____	teacher_____
flower_____	tomato_____
boy_____	toy_____
church_____	mouse_____

Homonyms	Circle the correct homonym in each sentence.

Subject A: It is (to-two-too) cold to go outside.
Subject B: (Would-Wood) you like to go?

Parts of Speech

Underline all nouns in the following sentences. (Subject A)
Underline all nouns and circle all verbs in these sentences. (Subject B)

Subject A: The old brown house has lots of broken windows.
Subject B: The children ran and played games all recess.

Possessives

Write the proper singular and plural possessive for each word.

Subject A: lily_____ _____
Subject B: box_____ _____

Use of Comma

Place commas where needed in each sentence.

Subject A: We bought beans rice meat and butter at the store.
Subject B: On March 12, 1979 it will snow in Washington Iowa.

Writing Letters

Place punctuation marks and capital letters where needed in each letter part.

Subject A	Subject B
583 maple st	r r 1 summit drive
readlyn iowa 50668	sumner iowa 50687
march 29 1979	april 18 1979
	dear mr jones
	your friend john

Prefixes and Suffixes

Write the prefix and suffix of each word listed below.

Incomparable_____ _____
prefix suffix

List of Common Homonyms Used for
Subject B's Assignments

too-two-to	deer-dear
their-there	by-buy
blue-blew	so-sew-sow
would-wood	do-due-dew
heard-herd	see-sea
know-no	read-red
knew-new	hear-here
not-know	flour-flower
ate-eight	bare-bear
rode-road	sun-son
meat-meet	

APPENDIX C

Daily Record Sheet

Subject: ____________
Week of: ____________

time					Day of Exp.: ___ Day of Week: ___ Date: ___ Task order: ___ Tasks comp: ___ Disruptions: ___

time					Day of Exp.: ___ Day of Week: ___ Date: ___ Task order: ___ Tasks comp: ___ Disruptions: ___

time					Day of Exp.: ___ Day of Week: ___ Date: ___ Task order: ___ Tasks comp: ___ Disruptions: ___

time					Day of Exp.: ___ Day of Week: ___ Date: ___ Task order: ___ Tasks comp: ___ Disruptions: ___

time					Day of Exp.: ___ Day of Week: ___ Date: ___ Task order: ___ Tasks comp: ___ Disruptions: ___

APPENDIX D

Log Notations

Day	Subject A	Subject B
2		partner disruptive
4	first seasonal thunderstorm	hailing, partner disruptive
6	heavy snowstorm	heavy snow storm
7	interrupted by psychologist	partner disruptive
8	light snow	partner disruptive
9	light snow	
10	light snow	just back from class play
12		partner late then disruptive
13	Ann's birthday	
14	day before Easter vacation	day before Easter vacation
15	bad cold	tornado drill between assignments
17	all four had bad colds	
23	visiting relatives in p.m.	
26	both partners absent	
27	pouring outside---raining in on classroom ceiling	

Day	Subject A	Subject B
34	school music program	school music program
35	school music program	school music program
40	last week of school started	last week of school started