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ABSTRACT

The effects of uninstructed and teacher instructed cooperative group learning on the interactive behaviors of 32 nonhandicapped and 16 handicapped (moderately mentally retarded) elementary students and also on the attitudes of nonhandicapped students toward handicapped persons were investigated. In the teacher instructed condition, the teacher gave instruction and feedback on cooperation. In the uninstructed condition, teacher discussion and feedback were focused on the task. In both conditions, students engaged in activities designed to promote interdependence and encourage participation of all group members. Social interaction behaviors during group science activities and free play were measured along with attitudes. Among findings were the following: (1) the social interaction behaviors of students during cooperative group activities differed significantly in the teacher instructed and uninstructed treatment conditions; (2) during the teacher instructed free play condition, the handicapped Ss engaged significantly more often in active participation (cooperative play and conversation); and (3) attitude pre- and post-scores did not differ significantly for teacher instructed, uninstructed, or control groups. A nine-page reference list is provided, as well as appendices that include: (1) a science lesson sequence, teacher scripts, and a teacher observation form; (2) observation categories, definitions, and protocols; (3) an attitude scale; and (4) tables of results. (CL)

Social Integration of Moderately Handicapped Students Through Cooperative Goal Structuring: Influence of Teacher Instruction on Cooperation

[Final Report]

By

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December, 1983

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CHAPTER I

INTRODUCTION

It has become increasingly clear that the role of teachers in organizing integrated activities for mentally handicapped and nonhandicapped learners is a critical factor in the success of mainstreaming. Many professionals (Bricker, 1978; Fredericks, Baldwin, Grove, Moore, Riggs & Lyons, 1978; Gottlieb, 1978; R. Johnson & Johnson, 1980; Rynders, Johnson, Johnson & Schmidt, 1980) have stressed the need for teachers to be more systematic in integrating students into classroom activities. Indeed, the intent of mainstreaming is unfulfilled if students of varying ability are simply in physical proximity but do not interact socially.

Cooperative Learning Groups

Recently, a number of innovative techniques such as cooperative study groups have been developed to help teachers plan and carry out social integration activities. However, very little guidance has been offered on how teachers should participate in the process. Moreover, teacher interventions are not always beneficial. In fact, the interventions may be interpreted as intrusions if they are haphazard; we do not know if "more" intervention is "better" (Certo & Kohl, 1982).

Inasmuch as many educators are advocating the use of cooperative learning groups in classrooms in which handicapped students are placed

(D. Johnson, Maruyama, Johnson, Nelson & Skon, 1981) it is imperative to find out how such groups can be made to function most effectively. A preliminary step to improving our understanding of the effect of teachers' behaviors in integrated classrooms is to take a close look at the elements embedded in a promising technique for integrating handicapped children in classroom activities: cooperative goal structuring.

Deutsch (1949) functionally defined a cooperative goal structure as one in which individuals are able to reach their goals only if all members in the group achieve their goals. He defined a competitive goal structure as a situation in which individuals achieve their goals only to the extent that other individuals in a group are unable to attain their goals. It was Deutsch's contention that individuals in cooperative situations will perceive themselves as "promotively interdependent," will tend to like one another, will try to influence one another's behavior, and will attempt to facilitate one another in achieving goals. In addition to being more productive in terms of the quality and quantity of performance, individuals will tend to be friendlier, have more of a group orientation, and will learn more from one another.

A situation in which an individual's goal attainment is not related to the group goal attainment has been characterized as an individualistic goal structure by D. Johnson and Johnson (1975). In an individualistic learning situation, an individual's rewards are based solely upon his/her own performance.

Since the 1920s a great deal of research has been conducted on the relative effects of cooperative, competitive, and individualistic learning environments on student performance (see reviews by D. Johnson & Johnson, 1979; Michaels, 1977; Pepitone, 1980; Slavin, 1977a, 1977b). In meta-analyses undertaken to compare the relative effectiveness of cooperative, competitive, and individualistic goal structures on achievement, D. Johnson et al. (1981) and D. Johnson, Johnson & Maruyama (1983) have compared the results of over 122 studies on the subject. Overall findings indicated that the cooperative method is superior to the other two in promoting achievement and productivity. R. Johnson and Johnson (1980), in particular, have extended this line of research to assessing the effect of cooperative, competitive, and individualistic experiences on the social relations of handicapped and nonhandicapped students. Their work is highly relevant to social integration research on persons with handicaps because they have studied social and affective variables as well as achievement. Dependent variables used in their studies include: (a) interpersonal attraction among students; (b) cognitive and social development; (c) self-esteem; and (d) achievement.

An overview of the research findings on the effects of cooperative, competitive, and individualistic learning situations on the social interactions of handicapped and nonhandicapped children suggests that of the three situations, cooperative structures produce more positive relationships which are characterized by mutual liking,

positive attitudes, mutual concern, friendliness, attentiveness, and feelings of obligation to each other (D. Johnson & Johnson, 1975). These findings are based on over 50 studies, including laboratory experiments, field experiments, and large surveys of entire school systems.

Allport (1954) has extended this line of work conceptually, believing that equal status among group members is a key factor influencing the success of cooperative groups. His contact theory postulates that positive inter-group relationships are based upon the conditions under which group members come into contact. The following are conditions for building positive relations according to Allport: (1) groups should have cooperative goals, (2) members should be of equal status, (3) the contact should allow group members to get to know one another, and (4) contact should be encouraged by authority figures and social norms. Along the same lines, Deutsch (1949) stressed that individuals need to facilitate the achievement of group goals for successful cooperative group outcomes. The expectation that moderately handicapped students will attain equal status or facilitate the achievement goals of the learning group, may, however, not be reasonable.

Despite the unfulfillment of Allport's and Deutch's conditions for optimal group functioning, properly structured cooperative group activities between handicapped and nonhandicapped students have been quite successful in terms of promoting positive social interactions and social acceptance D. Johnson & Johnson, 1983b; Rynders et al.,

1980). Nevertheless, there may be factors other than equal status or facilitation of goal achievement contributing to the successful outcomes of these cooperative learning groups. One of the most promising of these factors is that of the teacher role.

The Teacher's Role

Implicit in R. Johnson and Johnson's (1980) conceptualization of cooperative groups is the teacher's role in setting up cooperative groups. The investigators outlined the following framework to structure the role of the teacher in initiating cooperation during instruction:

1. As far as possible specify the instructional objectives.
2. Select the group size most appropriate for the lesson.
3. Assign students to groups.
4. Arrange the classroom so that group members are close together and the groups are as far apart as possible.
5. Provide the appropriate materials.
6. Explain the task and the cooperative goal structure.
7. Observe the student interaction.
8. Intervene as a consultant to help the group(s) solve its problems in working together effectively, learn the interpersonal and group skills necessary for cooperating, and check that all its members are learning the materials.
9. Evaluate the group products using a criterion referenced evaluation system. (p. 30)

Investigations of sociometric grouping and its impact on social status led Ballard, Corman, Gottlieb and Kaufman (1977) to recommend that teachers carefully structure group learning activities, giving students clear expectations and consistent consequences. They also suggested that teachers select activities that will create a task interdependence while still allowing for a wide range of ability levels. In view of previous findings that teacher behavior significantly affects children's behavior toward their handicapped peers (cf. Gottlieb, 1978), one cannot rule out the possibility that effects attributed to cooperative goal structures are actually the result of this significant teacher role. Therefore, there is a need to carefully investigate the effects of the teacher and goal structure variables in the interaction situation, separately and in combination, to determine their relative effects. For example, would cooperative behaviors occur if the teacher simply explained the cooperative task and the goal structure and then no longer intervened, making him/herself as unavailable as possible? Does positive goal interdependence alone produce cooperative behavior? How important is teacher discussion and feedback in this process? How intrusive should the teacher be in structuring cooperative learning situations?

Korsh (1980) focused on teacher behavior in cooperative groups when she compared the relative effects of instruction on task requirements, instruction on working cooperatively, and teacher feedback in a study of the group oriented and self-oriented behaviors of 93 third-grade students. Significant differences were found

between a control group that received instruction task requirements only and a group that listened to a lecture on good group functioning and task requirements as well as received feedback through teacher evaluations and group discussions.

Other investigators have stressed the importance of the teacher's role in facilitating integration. Gottlieb (1978), for example, in his review of the empirical evidence on environmental aspects of social adaptation stated the following:

> The teacher, being the most influential member of the classroom group, is able to influence the retarded child's behavior directly through the many reinforcers and sanctions she controls, and is able to influence the retarded child's behavior indirectly by the controls she exerts over the peer group. (p. 27)

On the side of caution, indiscriminate teacher participation in social integration activities may actually impede the occurrence of positive social interactions. Interestingly, Certo and Kohl (1982) observed that in planned integrated activities between a class of 6 year-old severely handicapped students and a first-grade class at a regular elementary school, teachers' attempts to assist student exchanges actually inhibited interactions momentarily or completely. The teachers' "facilitations" tended to be disruptive, leading Certo and Kohl to caution against the casual use of teacher assistance. It should be noted that Certo and Kohl's observation is anecdotal and not based on empirical work; therefore, future investigations will need to clarify the effects of the degree or amount of teacher intervention on task-related interactions.

Another aspect of the research on cooperative goal structuring of moderately handicapped students that has been relatively unexplored and merits greater attention is the degree of carryover of effects to less structured situations (Hartup, in press). Would the potential positive effects of cooperative goal structuring be maintained in activities where the teacher has minimal influence?

Significance of Problem

Legislation and judicial decisions of the past several decades, especially Public Law 94-142, have engendered dramatic changes in the way handicapped students are educated. Presently, many moderately mentally handicapped students who would not have had access to a public education in the past are now attending public schools. However, few of these students are mainstreamed in regular classes (United States Bureau of the Census, 1979), and many remain in segregated facilities. The intent of Public Law 94-142 was that students with handicaps, regardless of severity, should be educated in proximity to nonhandicapped peers, as much as is appropriate and possible. Gleidman and Roth (1980) wrote the following regarding the "vision" behind Public Law 94-142.

> It is to bring the handicapped child into the mainstream of childhood. It is to end his exclusion from social experience appropriate to children his own age. It is to provide him with an education that no longer reinforces--however inadvertently--society's traditional misconceptions and stereotypes about the abilities of handicapped individuals. (p. 218)

Integration may take many forms, ranging from the placement of

classes for moderately or severely handicapped students on a regular school campus (physical integration) to full academic integration, where handicapped and nonhandicapped students participate together in educational activities. Whether a moderately handicapped student can be integrated for academic activities depends, in part, on his/her instructional goals and objectives. At the minimum, appropriate social integration experiences of reasonable duration should be made possible for all students with handicaps. Putting human rights issues aside, there is a very practical rationale for integrating mentally handicapped students into school and community environments. First, natural social contexts can be "ideal" situations in which to teach social and other functional skills because natural cues, correction procedures, models for behavior, and other contingencies are more likely to be available (Brinker, 1982; Voeltz, 1983). Second, social integration may be the best mechanism for familiarizing nonhandicapped students with their handicapped peers (Brinker, 1982; Madden & Slavin, 1982; Voeltz, 1980, 1982). Opponents of social integration fear that moderately handicapped students (a) may be rejected by their peers in regular classes, (b) will not receive specialized services they need in integrated settings, and (c) will put an extra burden on regular class teachers and students (Madden & Slavin, 1982; Throne, 1975). Rather than segregate students on the basis of such arguments, what is needed are techniques to address these issues and facilitate the social integration process, such that social and academic outcomes will be favorable for both handicapped and nonhandicapped students.

The present study was designed to investigate the effects of one such technique, cooperative group learning, on the interactive behaviors of nonhandicapped students and handicapped students and the attitudes of nonhandicapped students toward handicapped persons.

Definitions

For the purposes of this study, the essential variables and concepts have been defined as follows:

1. Cooperation - refers to a social situation in which individuals can attain their goals only if all individuals in the group are able to achieve their goals.
2. Individualization - refers to a social situation in which an individual can attain his/her goal whether or not others in the group achieve their goals.
3. Competition - refers to a social situation in which an individual can attain his/her goals to the degree that other individuals are unable to achieve their goals.
4. Goal Structure - refers to the type of interdependence existing among students who are working toward the accomplishment of instructional goals.
5. Social Integration - refers to situations in which handicapped and nonhandicapped individuals are in physical proximity and have the opportunity to engage in interpersonal interactions (e.g., verbal exchange, interactive play).
6. Mainstreaming - refers to the physical, social, and educational integration of handicapped and nonhandicapped children.
7. Social Interaction - refers to the mutual or reciprocal action between at least two persons.

Summary

The purpose of the present study was to compare the relative effectiveness of two types of teacher behavior in the conduct of cooperative learning groups. Students involved in the investigation were nonhandicapped and moderately mentally handicapped students at the elementary school level.

CHAPTER II

REVIEW OF THE LITERATURE

The Move Toward More Inclusive Arrangements

The last several decades have brought profound changes to the field of education. Children can no longer be denied the right to an education under the present legal system. Moreover, schools are mandated to provide appropriate educational services for all children in the mainstream, as much as is possible. The impetus for such modifications involved a complex history of events and influences, such as newly emerging philosophies and conceptual shifts, legislative reform, and parent activism. Reynolds and Birch (1977) described the trends that relate to mainstreaming in special education, but go beyond special education in their scope, in terms of the "least restrictive alternative," "mainstreaming," "progressive inclusion," or "integration" (p. 22). Although it is beyond the scope of this paper to analyze all of the major forces supporting the move toward more inclusive arrangements, several will be described briefly because they provide an important background for the study of cooperative learning with handicapped students.

Normalization

In the 60's Nirje (1969) introduced the concept of normalization, which he defined as "making available to the mentally retarded patterns and conditions of everyday life which are as close as

possible to the norms and patterns of the mainstream of society" (p. 181). Wolfensberger (1972) elaborated on Nirje's definition in his statement that normalizaiton is the "utilization of means which are as culturally normative as possible, in order to establish and/or maintain personal behaviors and characteristics which are as culturally normative as possible" (p.28). Normalization is a key concept because it offers a goal-oriented process by which society can assist handicapped persons in the fulfillment of human rights.

PARC versus Pennsylvania

In the legislative realm a landmark case impacting upon handicapped persons was PARC (Pennsylvania Association for Retarded Citizens v. Pennsylvania, 1971). Its outcome established the right of every child to an education and made it the obligation of the public schools to provide this education. An important aspect of the PARC case is that the court ordered that educational services provided to all children must be appropriate to the needs and capacities of each individual child. This notion coupled the concept of integration with the concept of individuation.

The PARC Settlement Agreement of May 14, 1982 is revolutionary because it actually specifies what is meant by an appropriate education for severely handicapped learners, as exemplified in the following passage:

> Each student assigned to a class for the severely and profoundly impaired must be provided with a program of education and related services which is conducted in age appropriate schools attended also by nonhandicapped students, in natural proportions. Demonstration and model programs are supposed to be established which will provide high levels of interaction among severely handicapped students and nonhandicapped peers. (Pennsylvania Association for Retarded Citizens v. Pennsylvania, 1982, p. 2)

Public Law 94-142

Another major force underlying the move toward more inclusive arrangements is Public Law 94-142, the Education for All Handicapped Children Act of 1975. This law embodies many judicial principles involving special education; e.g., the right to education, due process, individualized programming, and the least restrictive alternative. Reynolds (1978) referred to Public Law 94-142 as "an educational Magna Charta for all those children who have been kept out of the mainstream of education for whatever reason" (p. xv). The sections of Public Law 94-142 that deal with the least restrictive alternative and an appropriate public education are central to the issue of mainstreaming and the social integration of moderately handicapped children. The principle of the least restrictive alternative insures that handicapped children will be educated in the least restrictive setting while also implying that there are alternative settings in which the child can be placed. Traditionally, regular classrooms have been thought of as the least restrictive and residential settings as the most restrictive, as is seen in the original cascade model proposed by Deno (1970). Reynolds and Birch

(1977) have since modified the original model in order to make special education less place-oriented in hopes that regular classes will become more diverse so that separate educational environments will not be necessary.

Whether or not placement in the "least restrictive alternative" also implies social integration for moderately handicapped students is, at present, an unresolved issue (Meyers, MacMillan & Yoshida, 1975). Perhaps part of the confusion over this matter lies with the impreciseness of the term integration, which may refer to a variety of organizational arrangements, such as placement of handicapped and nonhandicapped students in close physical proximity within a school building, bringing nonhandicapped students into a segregated facility for activities (reverse mainstreaming), or bringing handicapped and nonhandicapped students together for educational activities in a regular school building. Many public school systems in the United States still segregate moderately and severely handicapped students in separate school facilities although this practice, according to Gilhool and Stutman's (1978) interpretation, is in opposition to the principle of "least restrictive alternative," and has not been upheld by case law. A practical rationale for integration of educational programs for severely handicapped students was formulated by Brinker (1982) and is described in the following three points: (1) handicapped children may learn new behaviors by imitating behavior of nonhandicapped peers; (2) nonhandicapped children would offer a wide range of challenging experiences from which the handicapped child may

have been sheltered but which may nevertheless be necessary for development; (3) nonhandicapped children provide teachers and therapists with developmental models which will improve their understanding of the patterns and variations in development (p. 5).

Although practical, philosophical, and legal rationales for social integration have been established, empirical documentation of the effects of socially integrating mentally handicapped and nonhandicapped students has yielded mixed results. Earlier studies on the physical integration (without modification of methods or content) of educable mentally handicapped and nonhandicapped students do not point to beneficial effects (Devonney, Guralnick & Rubin, 1974; Fredericks et al., 1978; Semmel, Gottlieb & Robinson, 1979). It also has been found that mildly handicapped students are more socially isolated from their peers in the mainstream (Asher & Taylor, 1981; MacMillan, Jones & Aloia, 1974), and that nonhandicapped children tend to interact more frequently among themselves than with handicapped students in integrated settings (Peterson & Haralick, 1977; Porter, Ramsey, Tremblay, Iaccobo & Crawley, 1978). Guralnick's (1976) classic observational study of free play interactions between handicapped (mild, moderate, and severe) and nonhandicapped preschoolers revealed that nonhandicapped children interacted more frequently than was expected with mildly handicapped children and less often with moderately and severely handicapped children. In general, the theme which emerges from the research literature on social integration of mentally handicapped children is that mere placement of

such children in integrated settings does not yield positive results. Thus, many professionals argue that to be successful, integration activities must be structured more systematically, and that handicapped and nonhandicapped students need teacher guidance and encouragement (Bricker, 1978; R. Johnson & Johnson, 1982; Snyder, Appolloni & Cooke, 1977; Stainback & Stainback, 1981). A recent study by Voeltz (1982) is a noteworthy contribution to this literature because she found that the presence of severely handicapped students on regular school campuses (where no systematic integration programs were offered) was related to positive attitude change as compared to situations where no severely handicapped students were on campus. Nevertheless, the presence of a systematic peer interaction program was associated with significantly higher acceptance of individual differences on three attitudinal dimensions in comparison to schools without the interaction program and schools where no severely handicapped children were enrolled.

Strategies for Facilitating Positive Social Interactions

Most professionals would agree that changes are required in the instructional technology used to promote positive social interactions between mentally handicapped and regular class students. There are a variety of techniques that teachers can use to encourage positive social interactions, such as behavioral procedures, social skill training, training of nonhandicapped students, and structuring cooperative group learning activities.

Behavioral Procedures

Russo and Koegel (1977) used behavioral procedures, particularly positive reinforcement, in an investigation on improving the social interaction behaviors of a five-year-old severely handicapped autistic student placed in a regular class of 20-30 students. Teachers were trained by a therapist to administer token and social reinforcers to the student whenever appropriate behaviors were displayed (e.g., playing for several minutes with another child or sitting quietly for ten minutes). The student was trained initially by a therapist, after which the teacher implemented the procedures. According to Russo and Koegel, the target student's social interaction behaviors increased significantly and were maintained over time as a result of the procedures. Fredericks et al. (1978) also used positive reinforcements to encourage interactions between six moderately and severely handicapped preschool students and their nonhandicapped peers. They collected data during a five day baseline period and when the "facilitations" program, which involved reinforcing and encouraging the students for interacting, was instituted. The data collected during generalization settings in a motor room indicated that positive gains in the social behavior of handicapped students occurred. Some minimal gains were also observed in the language behavior of the handicapped students.

Along with procedures used to increase the frequency of positive social behavior, techniques have been used for the purpose of reducing or eliminating excess, or undesirable, social behaviors; among them

are extinction, time out, reinforcement of an incompatible behavior, and punishment. (See Berkson & Landesman-Dwyer, 1977; Renzaglia & Bates, 1983, for discussions of research on behavioral procedures and social skills training.) Some researchers maintain that elimination of an excess, or undesirable, behavior will provide an opportunity for a spontaneous increase in more positive behaviors (Koegel, Firestone, Kramme & Dunlap, 1974). Williams, Hamre-Nietupski, Pumpian, McDaniel-Marks and Wheeler (1978) advised teachers that "One of the first objectives of an educational program should be to decrease inappropriate behaviors." They did, however, caution that a program should never focus solely on decelerating behavior. On the other hand, researchers such as Barrett (1979), Wilcox and Bellamy (1982), and Voeltz, Evans, Derer and Hanashiro (in press) argue that an "eliminative" model, which focuses primarily on decelerating undersirable behaviors, should be replaced with a positive skill building approach. Often, behaviors targeted for reduction or elimination are a student's only functional means of controlling the environment. Accordingly, positive social skill building may be a more appropriate means for facilitating positive social interactions because students have access to functional alternatives to their current behavioral repertoires.

Social Skills Training

Techniques utilized for social skill instruction of mentally handicapped students include modeling, coaching, behavioral rehearsal,

verbal instruction, feedback, and more generally, teacher or peer prompting to elicit interactional behaviors. There is a body of literature describing these techniques, and several critial reviews exist (Gottlieb & Leyser, 1981; Gresham, 1981; Strain, Kerr & Ragland, 1981). The overall conclusion is that appropriate social skills can be taught to many handicapped students. (Few of the studies reviewed involved moderately or severely handicapped learners, however.) Basically, past methods have relied on selecting discrete behaviors (e.g., a greeting response or hand biting) to be initiated, increased or decreased (Voeltz, 1983b). The problem with this approach is that training discrete social skills is insufficient if a student does not know when to emit or withhold a particular behavior.

McFall (1982) stressed the importance of (a) the context in which behaviors occur and (b) the social rules by which one's behaviors are evaluated by others. Voeltz and Kishi (in preparation) outline a social performance curriculum model consistent with McFall's ideas. Rather than describing a dichotomous set of behaviors to be learned or eliminated, the focus is on the discriminations which must be mastered in order to meet the social performance demands of future and current environments. The major components of this model are the (1) major situation types (e.g., public or private events), (2) critical features of the situation types (e.g., the physical setting of an activity, whom student is interacting with), and (3) skill needs of a particular situation (e.g., initiating an interaction, indicating one's preference). A student's present and future environment are

assessed by conducting an ecological inventory, or assessing what nonhandicapped persons do in similar situations (Brown, Branston, Hamre-Nietupski, Johnson, Wilcox & Gruenwald, 1979).

The importance of training social skills in natural settings with nonhandicapped peers has been underscored by numerous professionals, such as Brinker (1982), or Brown, Nietupski, Hamre-Nietupski (1976). In an observational study, Brinker (1982) found significant differences in interactive bids by approximately 240 severely handicapped students to other students in integrated and segregated settings. The average rate of social bids (a social bid is any social behavior directed to another student) by severely handicapped students in integrated settings was 6.79 bids per 10 minute observation and 3.71 bids per 10 minute observation in nonintegrated settings. Social bids from other students toward severely handicapped students were also significantly more frequent in integrated settings. Clearly, segregated versus integrated contexts influenced the social behavior of the severely handicapped students studied.

Training Nonhandicapped Students

A third strategy used to promote interactions between mentally handicapped and nonhandicapped students is the modification of the attitudes and interactional behavior of nonhandicapped students. Often, nonhandicapped children do not know how to interact with handicapped peers and are sometimes uncomfortable and uncertain in doing so. Training programs have been developed to facilitate

interactions in integrated activities, such as Nietupski, Hamre-Nietupski, Schuetz and Ockwood's (1980) curriculum designed to teach nonhandicapped students about severely retarded students. Handlers and Austin (1980) implemented a training program for high school students which involved viewing films about handicaps, provision of information on handicaps, simulation experiences, and direct contact with handicapped students. Student attitudes, as assessed by the use of a self-report instrument, improved as a result of the training. Interestingly, the students noted that actual contact with handicapped students had the greatest impact upon their attitudes. Similarly, in a secondary analysis of data collected from a national sample of high schools by the Educational Testing Service, (in Madden and Slavin, 1982) it was reported that classroom discussions of race relations, teacher workshops, multiethnic texts, minority history, and heterogeneous groups had few effects on students racial attitudes and behaviors. However, the participation of students in multiracial sports and participation and assignment of students of different races to work together had strong and consistent effects on race relations. A program developed to improve attitudes toward TMR students was described by Cronk (1978) as "Mainstreaming in Reverse." A Children's Attitude Survey was developed to assess the attitudes of 127 children in the first, third and sixth grades toward moderately handicapped students. A situation was set up where regular education and moderately handicapped students engaged in structured interactions. The regular education students went to the special

education classrooms and engaged in activities that were already taking place. They were initially provided with an orientation and encouraged to interact with the handicapped students. The results of the Children's Attitude Survey revealed significant differences between the experimental group (which engaged in structured interaction) and control groups' final scores in both the third and first grades. Some of the responses indicated particular areas of negative attitudes and subsequent change in these areas. For example, the first grade children showed the highest percentage of negative responses relating to not wanting to play with the handicapped students or go into their classrooms. After the intervention, 50% of the students' responses changed in a positive direction. For example, many third graders felt the moderately handicapped child was a big "nuisance" to his family and would not be able to learn things, needing constant attention and help. The change from pre to posttest was from 30% to 9% relative to the number of respondents agreeing with the statement. The results of Cronk's assessment reinforce the notion that integration activities incorporating regular education and moderately handicapped learners can positively enhance attitudes of nonhandicapped students toward their handicapped peers. Yet, it is not known whether a reverse mainstreaming strategy will encourage greater acceptance of moderately handicapped students when and if they are moved into integrated settings. Perhaps this technique could be used advantageously in the preliminary stages of mainstreaming.

McHale and Simeonsson (1980) involved second and third graders in

half-hour play sessions with children classified as autistic. The play sessions were not highly structured; nonhandicapped children were told that the autistic children "do not know how to play" and that it was up to them to teach them to play. Attitudes toward handicapped students were assessed before and after the intervention, which lasted a week, and were found to be "overwhelmingly positive" on both occasions. Attitudes did not become more negative as a result of contact with the autistic students. The actual student-to-student interaction time for this particular intervention was of a rather short duration, a general problem with much of the research on social integration of handicapped students. It is quite possible that a Hawthorne effect might become a factor in a one week intervention of this type.

Voeltz (1982) monitored attitude change over a longer time span in an investigation on the attitudes of regular education students, from grades four through six, toward severely handicapped students. Attitudes were assessed at the start and the end of the school year, and it was shown that increasing levels of contact resulted in increasing acceptance, as measured by the Acceptance Scale. Results supported the use of structured integration activities, but also indicated that contact alone produced positive attitude change. Attitudes, as measured on the Acceptance Scale, were found to correlate moderately with actual behavior. Students' attendance in a special friends program was related to attitude scores.

Voeltz (1982) recommended that more attention be given to the types of relationships between nonhandicapped and handicapped students

that are being encouraged. Typical "peer tutoring" activities often take the form of helping relationships (Certo & Kohl, 1982; McHale, Olley, Marcus & Simeonsson, 1981; McHale & Simeonsson, 1980) which in some cases may foster more negative attitudes, because, as Donaldson (1980) and Krouse, Gerber & Kauffman (1981) noted, the idea of helping or teaching a less-capable person is often overemphasized, thus stigmatizing the child being tutored. The research on peer tutoring has shown that there are short-term benefits in terms of producing observable academic gains, modifying undesirable behaviors, and increasing the amount of individual attention a student receives Krouse et al., 1981; Leyser & Gottlieb, 1981). However, as Krouse et al. pointed out, the long-term social effects of this practice have yet to be examined carefully, especially in terms of its impact on peer cooperation and mutual concern.

In contrast to hierarchical tutor-tutee relationships, mutually rewarding friendships are a more preferable goal to strive for in regard to relations between handicapped and nonhandicapped children. Voeltz and Brennan (in press) found differences in the manner in which nonhandicapped students and teachers interact with and perceive their relationships with severely handicapped students. For example, nonhandicapped teenagers exhibited more positive affect than teachers when involved in structured dyadic interactions with two severely handicapped adolescent girls. Teachers, however, oriented more toward severely handicapped students than the teenagers did. Elementary age students oriented away from severely handicapped peers significantly

more often and engaged in more appropriate play than teachers. Nonhandicapped students, grades 1-9, who responded to a friendship survey, reported that they liked their best friend and their severely handicapped "special friend" for sociability reasons, whereas they did not indicate the same reason with respect to their mother or caregiver. These results suggest that nonhandicapped children interact with severely handicapped students differently from caregivers, and they perceive their relationships with best friends, special friends, and caregivers in different ways. Hartup (in press) noted that friendships between handicapped and nonhandicapped peers parallel cross-age or mixed-age friendships, which typically occur in our society and can provide "constructive challenges" in socializing individual children.

There are alternatives to peer tutoring or helping situations, such as leisure time activities or even some academically oriented activities (e.g., science) in which handicapped and nonhandicapped peers can mutually participate and enjoy. Structuring cooperative learning groups (R. Johnson & Johnson, 1982) has the potential of fostering more horizontal, as opposed to hierarchical, peer relationships, because students work together to complete a group product and achieve a group reward.

Cooperative Goal Structuring

D. Johnson and Johnson (1975) described three major methods teachers can use to organize learning situations: cooperatively,

individually or competitively. Cooperative learning situations require a positive goal interdependence, wherein the group learning goal is achieved only if all the students work together in attaining their goal. Individualistic learning situations require that a student's goal attainment is a matter of reaching one's personal goal and is unrelated to the goal attainment of others in the group. Competitive learning situations result when one student is able to achieve his/her learning goal only if another student in the group fails. According to D. Johnson, Johnson & Maruyama (1983), the type of goal interdependence used to structure classroom learning determines whether interpersonal attraction or increased interpersonal rejection results among heterogeneous students (p. 13). Comparisons of cooperative activities with individualistic and/or competitive activities with handicapped students have involved sciences activities (e.g., coal as an energy source, R. Johnson & Johnson, 1982, recreational bowling, Rynders et al., 1980, and group skits, Chenault, 1967), for example.

In D. Johnson, Johnson & Maruyama's (1983) most recent meta-analysis, 26 studies comparing the effects of goal structures on interpersonal attraction between handicapped and nonhandicapped studies were reviewed. Cooperation and cooperation with intergroup competition were compared with interpersonal competition and individualistic learning. Each comparison yielded a statistically significant z-score that favored the cooperative conditions in terms of promoting greater cross-handicap liking. The overall conclusions

based on the meta-analysis were that (1) cooperative experiences promote more positive relationships among individuals from different ethnic backgrounds, between handicapped and nonhandicapped individuals, and more homogeneous individuals than do cooperation with intergroup competition, interpersonal competition, and individualistic experiences, (2) cooperation with intergroup competition tends to promote more positive relationships across ethnic and handicap lines and among homogeneous individuals than do interpersonal competition or individualistic experiences, and (3) there seems to be little difference between the impact of interpersonal competition and individualistic efforts on interpersonal attraction.

Given the considerable number of studies supporting the use of cooperative learning groups, researchers are beginning to look at the variables influencing or mediating the findings on cooperative learning. A few investigators have conducted studies containing only a cooperative condition, and have shown that cooperative interaction leads to "positive cross-ethnic relationships or to reductions in prejudice, interpersonal attraction and positive relationships between handicapped and nonhandicapped children" (D. Johnson, Jonnson & Maruyama, 1983, p. 31).

D. Johnson, Johnson and Maruyama (1983) emphasize the fact that nonhandicapped students often develop negative attitudes and stereotypes about handicapped persons prior to placement in a heterogeneous classroom. Thus, whether initial stigmatization develops into more extreme negative attitudes depends, in great part, on how the interaction is structured.

Cooperative Goal Structuring with Moderately Handicapped Students

R. Johnson, Rynders, Johnson, Schmidt and Haider (1979) appear to be the first researchers to compare the usefulness of cooperative, competitive, and laissez faire interventions in socially integrating moderately mentally handicapped children. In their study, 12 junior high school students classified as mentally retarded, functioning at a high trainable level, and 30 nonhandicapped junior high school students participated in recreational bowling for six weeks. Students were instructed to raise their group bowling score to meet a set criterion (a 50 point improvement over the previous week) in the cooperative condition. In the individualistic condition students were instructed to raise their individual scores to a set criterion (10 points over the previous week). Students were given no instructions in the laissez faire condition. Two dependent variables were included in the study: (a) positive and negative interactions were recorded, as was their directionality (with other nonhandicapped or handicapped students) and (b) the frequency of the simultaneous cheering of all the students within a condition for one of their bowlers. Results indicated that the total number of interactions in the cooperative condition differed significantly from those in the individualistic and laissez faire conditions. On the average, each handicapped student was engaged in 17 positive interactions with peers per hour in the cooperative condition, 5 in the individualistic condition, and 7 in the laissez faire condition. Group cheers for handicapped students when they threw strikes or spares occurred 58% of the time in the

cooperative condition, 9% in the individualistic condition, and 13% in the laissez faire condition. A second bowling study was conducted by Snyders et al. (1980) with junior high school students with Down syndrome, and nonhandicapped students. In this study, cooperative, competitive, and individualistic goal structures were compared on the dimensions of interpersonal interaction and attraction. Students in the cooperative condition were instructed to offer one another encouragement, reinforcement, and assistance in addition to meeting the set criterion. Higher frequencies of praise, encouragement, and support among nonhandicapped students and handicapped students were found in the cooperative condition than in either the competitive or individualistic structure. The number of positive interactions in the cooperative condition differed significantly from those in the individualistic or competitive conditions. The students with Down syndrome actually bowled relatively poorly in comparison with their nonhandicapped peers, which, one might expect, would generate negative feelings toward them. Despite the low bowling scores of the students with Down syndrome, they were encouraged (behavioral interaction data) and liked (attitudinal data) by nonhandicapped peers. The invesitgators assessed interpersonal attraction through a sociometric measure because they were concerned over the lack of empirical evidence regarding the link between behavioral interaction and attitudinal outcomes. Students were asked to rank order the photographs of 9 other students in their goal structured condition from the standpoint of their most favorite to least favorite person

with whom to bowl. These data indicate that nonhandicapped students ranked the handicapped students higher in the cooperative condition than did students in the other two conditions. The students with Down syndrome in the cooperative condition also ranked their nonhandicapped peers significantly higher than the Down syndrome students in the other two conditions. Bowling socres were also assessed and found not to be significantly different across conditions. There was a tendency for students to perceive their instructor as more personally accepting, but this tendency did not produce statistically significant differences.

In discussing their results, Rynders et al. suggested that Deutsch's (1949) theory on goal facilitation does not account for the finding that more positive interactions and sociometric ratings between nonhandicapped and Down syndrome students occurred in the cooperative condition, because the Down syndrome students lowered the group's overall bowling achievement. Deutsch's theory posits that goal facilitation leads to interpersonal attraction, and when an individual's behavior frustrates the achievement of a goal, the resulting negative feelings become transferred so that individual and interpersonal rejection results. Rynders et al. speculated that a group's success may be related to indirect (praise and encouragement) as well as direct (high bowling scores) contributions.

The results of the Rynders et al. (1980) study are important because they suggest, as stated by the investigators, "that teachers may place low-achieving students in properly structured heterogeneous

cooperative learning groups for selected tasks and expect to find evidence of and positive interaction resulting, even though low-achieving students' performance pulls down the group's score" (p. 273). Other positive aspects of this investigation are that it is one of the few studies on adolescents; the social integration activity took place in the community, a very natural context for current and future interpersonal encounters; and the task (bowling) has longitudinal value as a leisure/recreation activity that will have relevance in current and future environments.

The authors did note, however, that the study was limited due to the sample size, type of task, length of the study, operationalization of independent variables, and subjects' characteristics. The use of peer rankings as a sociometric (attitudinal) assessment also has its limitations. Asher and Taylor (1981) pointed out that such a measure assesses best friendships more than acceptance. Perhaps a rating-scale measure would have been more appropriate for this situation because it reflects a more general acceptance dimension. Rating scales also tend to capture more subtle degrees of change along a continuum of positive or negative acceptance, giving a more varied picture of how students are perceived by their peers. In addition, rating scales are more sensitive to changes in the choice criteria, such as "I like to work with" or "I like to play with" types of questions (Singleton & Asher, 1977). Because Rynders et al. (1980) used an activity based criterion to assess attitudes, it is surprising that they did not also employ a rating-scale measure.

A key issue in the research on cooperative group learning is the maintenance of positive effects on peer relations (such as improved interpersonal interaction, increased interpersonal attraction, or improved attitudes). Interactive behaviors, if measured during the instructional setting, should also be assessed in post-instructional situations. If students are specifically told to exhibit specific cooperative behaviors in one treatment condition (e.g., to offer each other encouragement, reinforcement, or assistance) and in another treatment condition they are told to maximize their own score, one would expect student's verbal interactions to vary between the two conditions as a result of the instructions. The real test of the effectiveness of the procedures would be in situations where the teacher or experimenter's influence is removed or minimized. Maintenance of positive effects has been addressed in some of the studies by Johnson and Johnson, documented primarily through observation of students in post-instructional free choice situations (D. Johnson & Johnson, 1981; Johnson, Johnson, DeWeerdt, Lyons & Zaidman, 1983c; Martino & Johnson, 1979). When D. Johnson and Johnson (1981) assigned students to new groups and asked them to play a structured game, there were no significant differences between treatments in cross-handicap interaction. The trend, however, favored the cooperative groups.

In the first of the cooperative group learning studies with moderately handicapped students described here (R. Johnson et al., 1979), cooperative and individualistic goal structures were compared

with a laissez faire intervention. According to Rynders (1983), the students in the laissez faire condition tended to behave similarly to the students in the competitive condition. It is known that children tend to compete in many situations, especially those of an educational nature or in games or sports. This is probably a result of a history of competitive traditions in such situations. Therefore, in their second bowling study, a competitive condition was used by Rynders et al. (1980) in place of the laissez faire condition. If "control" or contrast groups are used in this line of research, it would be advisable to carefully monitor the ongoing group interactions in terms of cooperation, competition, or individualistic behavior, because students tend to naturally adopt a type of goal structure of their own, and if comparisons are to be made, it is important to fully understand what is being compared.

Surprisingly, very few investigations on cooperative learning with handicapped students have compared a cooperative condition with less structured learning situations, such as an open classroom, or with variations of the cooperative condition itself. Typically, cooperative learning is contrasted with types of whole class instruction, utilizing competitive or individualistic goal structures. As Sharan (1980) stated, "It may be more instructive to compare variations in interactive learning, than to contrast cooperative teamwork with classroom learning where communication in mediated by the teacher and pupils do not interact directly. In order to understand the process as well as the products of cooperative learning we must learn about what transpires within the group" (p. 267).

A common complaint in regard to cooperative learning studies, in general, is the short duration of the studies. The bowling studies (R. Johnson et al., 1979; Rynders et al., 1980) lasted for six weeks and most of the mainstreaming intervention studies by Johnson and Johnson lasted from two to ten weeks. Madden and Slavin (1982) conducted an investigation over a school term, from September to May, and urged that researchers do more longitudinal work and increase the length of treatment sessions.

> Short-term interventions have operated under the assumption that once the student's status is improved, social forces will maintain the improvement. Since it seems unlikely, given the competitive structure of the traditional classroom, that this assumption is tenable, a cooperative intervention that changes this structure and can be imbedded in the ongoing classroom system may be required to bring about lasting improvement in the social status of mainstreamed MAH [mildly academically handicapped] students (p. 35).

It seems reasonable to conclude that both short-term and long-term interventions make contributions to our knowledge base. What short-term studies lack in opportunities for peer relations to develop over time they probably gain in experimental control over the study (e.g., treatment integrity). Also, as Sharan (1980) pointed out in his review of the literature on cooperative learning, even though many experiments have been of short duration, the effects were quite positive, which attests to the intensity of their impact. Finally, the impact of group size on cooperative learning activities with mentally handicapped and nonhandicapped students has not been determined. Clearly, the quality of interactions will differ in dyads

versus triads versus groups of four. Yet, we do not know, at this point in time, how it differs.

Individualization in Cooperative Learning Groups

Given the fact that moderately handicapped students, by definition, most likely will be unable to perform at the same level as their nonhandicapped peers in cooperative learning activities, individualized instruction used in combination with group learning may be a very reasonable approach to organizing instruction for such heterogeneous groups. Madden, Slavin and Leavey (1982) used Team Assisted Individualization (TAI), a cooperative learning intervention incorporating individualized instruction, with eighteen elementary mathematics classes that were assigned randomly to TAI, materials only, or control treatments (handicapped students were mildly academically handicapped). In the study, students were initially pretested, and placed in an individualized mathematics curriculum on the basis of their test performance. All students then worked on individualized packets. Teammates helped each other with problems and checked each other's answers. Then, the group scores were computed, based on the average number of units completed by all team members and on each team member's scores on summative tests. If a team exceeded a pretest criterion, they received attractive certificates. Materials-only classes used the same curriculum materials and general procedures, however, they did not work in teams or receive team rewards. The control group was not treated.

Results indicated that the mildly academically handicapped students were significantly less often rejected by their peers and significantly more often named as friends in the TAI and materials-only classes. Behavior ratings for TAI students also changed dramatically; at pretest they were rated much lower than regular education students but at posttest the ratings equaled those of the regular education students. Unfortunately, the separate effects of cooperative learning and individualized instruction could not be evaluated from the TAI-control comparison because both are components of the TAI model. However, results showed that the individualized (materials-only) program was not as positive as the TAI program, but the results were "quite strong." Achievement differences were not significantly different for the mildly academically handicapped subsample, but the full sample of students in the TAI treatment learned significantly more than control students (Slavin, Leavey & Madden, 1982). Using individualized instruction in cooperative learning groups may be a very promising approach for integrating moderately handicapped students because it can be used with very heterogeneous classes while maintaining the social and motivational benefits of cooperation. Moreover, given the surprisingly large effects of individualization (as opposed to cooperative learning) on the social outcomes of mainstreaming (Madden & Slavin, 1982), further investigation is certainly warranted.

The Teachers Role in Social Integration

Most of the social integration techniques described thus far rely heavily upon the classroom teacher's implementation for their success. It has been reported that regular classroom teachers often feel negatively about teaching mentally handicapped students (Shotel, Iano & McGettigan, 1972), and perhaps this is partly due to their perceived sense of lack of preparation (Gickling & Theobold, 1975).

Teacher Attitudes

An investigation by Weber (1977) focused on the attitudes of public school teachers toward trainable mentally handicapped (TMH) students. Weber administered a survey instrument which attempted to assess teachers' knowledge of handicapping conditions, attitudes toward mainstreaming, and attitudes concerning the adaptive capabilities of mentally handicapped students. Subjects were a random sample of elementary, middle, and secondary school teachers in Georgia.

Results indicated that 95% of the teachers had heard of the categories of TMH and EMH. Over 50% of them thought the condition of retardation was inherited. Weber maintained that this latter type of response has implications for societal stereotypes of families with handicapped members. It was overwhelmingly agreed (95%) that TMH and EMH children should be allowed to interact with nonhandicapped children, but less than half of the teachers felt that there would be academic and social benefits for TMH and EMH students, and 36% of the

sample surveyed felt it would only benefit EMH students. Overall, respondents felt it would be profitable for EMH and TMH students if special services were integrated into regular school buildings. Surprisingly, less than 33% felt that nonhandicapped children would benefit from having EMH and TMH children in the regular classroom. In general, they felt that mainstreaming was better for handicapped students than regular class students. Finally, only 25% were in favor of having a regular class teacher work with TMH and EMH students. The response rate for the survey was only 28%, which raises questions about the generalizability of the results and internal validity of the study.

To date, evidence regarding the degree to which teacher behaviors convey attitudes to children is equivocal. However, it has been demonstrated that teachers clearly influence the social adaptation of mentally handicapped students in integrated classrooms (Gottlieb, 1978). This might occur in various ways, such as through explicitly setting up expectations for students' interactive behaviors, through positive reinforcement of handicapped students, positively rewarding social interactions, or modeling appropriate interactive behaviors. We know that teachers clearly influence the social adaptation of mentally handicapped students in the integrated classroom, yet evidence regarding the degree to which teacher behaviors convey attitudes to children is less clear.

Conducting Cooperative Goals

The impact of specific teacher behaviors on the social outcomes of cooperative learning activities has been relatively unexplored. One exception is an investigation by Korsh (1980), which focused on teacher behavior in cooperative groups. She compared the relative effects of instruction on task requirements, instruction on working cooperatively. and teacher feedback in a study of the group oriented and self-oriented behaviors of 93 third-grade students. Her treatment conditions were as follows: (a) in condition I (the control condition), children listened to stories unrelated to group functioning and task requirements; (b) in condition II (lecture), students passively listened to teacher instruction on good group functioning and task requirements; (c) in condition III (lecture and feedback), students listened to a lecture on good group functioning and task requirements and received evaluation and feedback through teacher evaluations and group discussions. After the stories and/or teacher guidance, triads of students performed construction tasks with pattern blocks. Multivariate analysis of the data revealed overall significant differences between the third condition (lecture and feedback) and the first (control) on behaviors falling in the group-oriented categories (structuring the group, responsiveness, helping with tasks). The analysis of condition II (lecture) did not differ significantly from that of the control condition. Treatments II (lecture) and III (lecture and feedback) did not differ significantly overall, however, there was "a strong trend toward a significant difference between them when only the most discriminating measures were considered" (p. 67).

Unfortunately, it is not possible to discern which experimental variable in the third condition accounted for the large differences in effects. Was group discussion the key factor? feedback? or both in combination? Korsh acknowledged that the findings clearly present problems for interpreting the relevant independent variables. Understanding the separate effects of the variables might provide practitioners with valuable information on the relative importance of particular teacher practices and result in a refinement of teaching strategies and improved conduct of cooperative learning procedures.

R. Johnson, Johnson, DeWeerdt, Lyons and Zaidman (1983) compared the effects of cooperative and individualistic goal structure between nonhandicapped and severely adaptively handicapped students. Students participated in a science unit on nutrition for 10, 55 minute sessions. The label "severe" was used somewhat unconventionally in this investigation. Subject's IQ's ranged from 55 to 71, which according to the Manual on Terminology and Classification in Mental Retardation (Grossman, 1973), falls in the mildly handicapped range. Dependent variables in the study were achievement, verbal interaction, proximity, social-schema measures of interpersonal attraction, and several attitude scales. Proximity was measured during free play using the Density Distance Index, which was designed to provide an indication of the number of individuals in the immediate environment of a retarded student. Results indicated no significant differences between the cooperative and individualistic conditions on achievement. The measures of interpersonal attraction all indicated that greater

interpersonal attraction and proximity occured in the cooperative condition. Also, the classroom climate was found to be much more supportive in the cooperative condition. The authors reported that severely handicapped students felt a greater sense of belonging, and the nonhandicapped students felt more academic support from peers and saw the class members as more cooperative and less individualistic.

The importance of the teacher's role in initially instructing nonhandicapped students in the group was emphasized by Johnson et al. in this investigation. They suggested that teachers can facilitate positive social interactions by instructing handicapped students in social skills. These recommendations merit close attention in future research efforts, because they raise some unanswered questions about the impact of such teacher behaviors. For example, how should teachers instruct nonhandicapped students to work with handicapped peers? What will the content of this instruction focus on? Should the students be taught behavioral procedures? Should they learn about different types of handicapping conditions? Perhaps instructions should not center on how to get along or work with handicapped peers. Rather, information on working and cooperating with any peer might be more promotive of positive peer relations. Information about particular handicapping conditions, for example, may set up helping relationships that are similar to those between nurses and their patients.

Summary

An attempt was made at the beginning of this literature review to establish a rationale for the social integration of moderately handicapped students. Philosophical shifts, legislative reform, practical considerations, and empirical documentation of positive effects of social integration of mentally handicapped students (Brinker, 1982; Voeltz, 1982) have led to the placement of many moderately handicapped students on public school campuses. Given the outcomes of decisions in the legislative realm, such as the Pennsylvania Association for Retarded Children v. Commonwealth of Pennsylvania (1971) case, it is highly likely that the trend to integrate moderately handicapped students will continue. Research on integration efforts suggests that simply putting handicapped and nonhandicapped students in close physical proximity does not produce positive results (Asher & Taylor, 1981; Guralnick, 1976; MacMillan, Jones & Aloia, 1974), although an investigation by Voeltz (1982) indicated that presence of severely handicapped students on regular school campuses related to positive attitude change in the nonhandicapped students. Most professionals would agree with Leyser and Gottlieb's (1981) insistance that "active programs developed by teachers are an absolute necessity" (pp. 234-235).

Techniques used to facilitate positive social interactions between handicapped and nonhandicapped children include behavioral procedures, social skill training, training nonhandicapped students,

peer tutoring, and structuring cooperative learning groups. The use of cooperative learning activities is a very promising approach for promoting positive social interactions for at least three reasons. First, cooperative learning groups provide a natural, integrated context in which a handicapped student may learn appropriate social behavior. The importance of natural cues and correction procedures have been demonstrated by Brown et al. (1976). Second, the purpose of cooperative group activities is to promote acquisition of skills. Thus, the emphasis is not strictly on decelerating or eliminating negative or excess behaviors. The "elminative" model (Wilcox & Bellamy, 1982) does not provide students with functional alternatives to their excess behavioral repertoires. Third, cooperative group learning activities are more likely to foster relationships that are mutually rewarding rather than are those which are hierarchical, helper situations. These friendships may be similar to cross-age friendships, which occur quite naturally in society, although less frequently in our age graded school systems (Hartup, in press; Voeltz, 1982).

There is substantial evidence documenting the effectiveness of cooperative learning on interpersonal relations between handicapped and nonhandicapped children (D. Johnson, Johnson & Maruyama, 1983; D. Johnson, Maruyama, Johnson, Nelson & Skon, 1981; Slavin, 1977a). Several studies comparing a cooperative goal structure with individualistic and competitive goal structures have involved moderately handicapped students (R. Johnson et al., 1979; Rynders et

al., 1980). In both investigations cooperative goal structures yielded more positive verbal interactions. Student rankings, used as a measure of interpersonal attraction, were assessed in the Rynders et al. (1980) study and found to be significantly higher for the cooperative condition. These studies make a substantial contribution to the field, particularly because they are a radical departure from traditional (hierarchical) peer tutoring approaches and can be used with functional activities in natural community settings. Moreover, this approach provides teachers with specific guidelines for promoting integrated activities in their classrooms (D. Johnson & Johnson, 1975).

A number of gaps in the research regarding the effects of cooperative goal structuring on relations of moderately handicapped and nonhandicapped students still need to be addressed. (a) Little is known about the relative contribution of the different process components that make up the cooperative goal structure "package," as it is decribed by R. Johnson and Johnson (1980). Two components that might be compared are an uninstructed situation, where the teacher is passive after instructing the group on the task, and a teacher instructed situation, where the teacher discusses cooperative behavior before the activity to help the group to work together effectively. (b) There is a need to investigate the impact of different tasks on cooperative group learning activities. It is often assumed that integration activities for moderately handicapped students can only occur in physical education, music, free play or lunchroom contexts.

This notion should be challenged through empirical research efforts. (c) Very little research applies this technique to promote interactions between moderately handicapped and nonhandicapped children. Future investigations could vary the composition of the groups, or use different dependent measures, for example. (d) The degree of "staying power" or generalization of effects after the goal structuring components (e.g., teacher instruction and feedback) are eliminated has yet to be clearly demonstrated. (e) The duration of some cooperative group studies should to be extended in order to assess the effects on peer interactions over time. (f) Little is known about the optimum size of cooperative learning groups for facilitating positive interactions.

With respect to the present study, this review of pertinent research does not clearly indicate what the relative contributions of (a) the cooperative goal structure and (b) teacher instruction and feedback on cooperation are to the success of cooperative group activities in improving social interactions between nonhandicapped and handicapped students. An activity that, theoretically, should produce more positive social interactions in cooperative groups is teacher instruction and feedback on cooperative behavior.

Chapter III

METHOD

The purpose of the present study was to measure the relative effectiveness of two teaching techniques, in the context of cooperative group activities, on the attitudes and behaviors of moderately handicapped and nonhandicapped students. The two cooperative group conditions were (1) uninstructed and (2) teacher instructed. In the teacher instructed condition, the teacher gave instruction and feedback on cooperation. In the uninstructed condition, teacher discussion and feedback was focused on the task.

Assumptions and Hypotheses

Based on past studies by Johnson and Johnson (reviewed in D. Johnson, Johnson & Maruyama, 1983), Korsh (1980) and Rynders et al. (1980), it is speculated that teacher instruction on cooperation will foster more positive social interactions among nonhandicapped and moderately handicapped students engaged in cooperative learning activities in which the teacher instructs students on cooperation. In this investigation hypotheses 1-3 are stated in the null form because the direction of differences between groups on dependent variables of interest (social interaction behaviors, attitudes of nonhandicapped students) is relatively unknown. A directional hypothesis should only be used when there is "little or no possiblity that the findings will yield a difference or relationship in the opposite direction" (Borg &

Thirty-two fifth grade students, 15 boys and 17 girls, participated in the cooperative group interventions. Sixteen participants, 3 boys and 13 girls, were classified as mentally handicapped. Of this group, 13 were considered to be moderately mentally handicapped, with IQ scores on the Weschler Intelligence Scale for Children (WISC-R) ranging from <35 to 52. According to the Manual on Terminology and Classification in Mental Retardation (Grossman, 1973), students classified as moderately mentally handicapped (or moderately retarded) are characterized by subaverage intellectual functioning and, when tested on standardized intelligence tests, such as the Stanford-Binet Test and the Wechsler Scale, their scores are from three to four standard deviations below the mean. They also exhibit deficits in adaptive behavior. Three students involved in the study had IQ's in the range usually classified as severe retardation (below 35), but were placed in a class for moderately handicapped (or trainable mentally handicapped) learners and would be considered high functioning severely handicapped students. All of the students were being educated in self-contained classrooms in a regular public elementary school and had no experience in integrated educational situations, such as in reading, physical education, or art classes. Many had, however, experienced visits from peer tutors in their own self-contained classes.

The Topeka Kansas Association for Retarded Citizens (TARC) Assessment Inventory for Severely Handicapped Children (Sailor & Mix, 1975), designed to provide a short form of educational assessment for

children from 3 to 16 years of age with moderate to profound mental retardation, was used for describing the moderately handicapped sample and as the basis for stratifying students prior to random assignment. This instrument is often employed by teachers of moderately handicapped children and was particularly useful for the purposes of this investigation as a short, efficient instrument for assessing more global functioning (Doucette & Freedman, 1980). Data on the four domains of self-help skills, motor skills, communication skills, and social behavior were gathered by obtaining information from students' teachers. Students' scores on the TARC ranged from 119-190, $\bar{X}$=165.7, SD=24.9.

The 48 students composing the sample came from classrooms designated by the school principal as possible candidates for the study. The selection of two fifth grade classes for participation (all of one class and a random selection of four volunteers from another class) was based on whether or not they had completed the science unit to be used in the study. The classrooms that had not participated in a similar science unit were, therefore, selected. Moderately handicapped students were drawn from 3 self-contained special education classes. Twelve students were selected from the two "upper" level TMH classes (older students, CA range 11-14, $\bar{X}$ = 11.7). Two students, one from each TMH class, were not invited to participate, based on teachers' judgments that the students could not meet the minimum requirements for functioning in a small group, due to severe behavior problems. Four additional moderately handicapped

students were selected from a special class of younger students, ages 9-11. Unfortunately, it was not possible to obtain enough students from this low incidence population to randomly select an adequate sample. Logistics and administrative matters also prohibited randomly selecting fifth graders, although there appeared to be no systematic bias in the selection of the particular class, which was done on the basis of lack of experience with the science unit used in the study. Additionally, it was felt by the school administrators that the regular class teacher who agreed to participate in the study should include his entire class in the science unit for purposes of continuity and consistency of the ongoing educational program.

All regular class students were informed that they would be working in small learning groups with handicapped and nonhandicapped peers. Handicapped students were told that they would be working with regular class fifth graders. Parental consent was obtained for all participants in the study (see Appendix A for samples of the Parent Permission letters).

Students were stratified for ability level, sex, and handicapping condition and assigned randomly to groups. Teachers of the fifth grade students were asked to rate each student in terms of high, medium, and low relative ability levels. Moderately handicapped students were also placed into one of three ability categories on the basis of their TARC score. The high, medium, and low groups of handicapped students were formed on the basis of three naturally occurring clusters of scores; 187-189 (high), 165-187 (medium), and

119-139 (low). The flip of a coin then determined into which group a student was placed. Eight students were assigned to each treatment condition. There were no significant differences between moderately handicapped students in treatment groups on TARC scores or IQ scores after assignment. Triad assignments were also randomized, using an eight sided die. The ratio of girls to boys in most of the triads was 2:1, however, in one treatment condition, one triad consisted of two boys and one girl and in the other treatment condition two triads had two boys and one girl. Research has shown the existence of sex-related differences in small-group activities with respect to activity level, dominance, and aggression (Brodzinski, Messer & Tew, 1979), therefore the sex ratio of triads was balanced.

Design

Procedures

During the week prior to the interventions, the Acceptance Scale (Voeltz, 1981), an attitude assessment, was administered to the 32 nonhandicapped fifth grade students involved in the cooperative group intervention, and 24 students from two other fifth grade classes. This latter group of students volunteered to be involved in the study and written parental approval was obtained. The purpose of assessing nonparticipants was to provide information on attitudes of a contrast group of students not engaged in structured social interactions with moderately handicapped students. The Acceptance Scale was also administered about four weeks later (i.e., the pretest was on March 24 and the posttest was on April 25).

A pilot study was conducted before the investigation. The moderately handicapped and nonhandicapped students observed, engaged in free play, art class, and a class birthday party. Observations took place in a home setting and in a public school. The purpose of this pilot study was to provide observers with further experience using the observation instruments and familiarize them with the types of students involved in the study.

Two treatment conditions were compared in this study; one consisting of teacher instructed cooperative learning group activities and the other uninstructed cooperative learning group activities. The interventions were conducted over a two and one half week time period, for a total of ten, 45 minute daily sessions. Each day of the study, students participated in science activities for approximately 35 minutes and free play sessions which lasted approximately 10 minutes. During free play sessions, students were encouraged to move around the classroom and interact with other students.

During the instructional sessions, three students, one moderately handicapped and two nonhandicapped, were seated at adjacent desks or at a small table during the science activity sessions. Each classroom housed eight triads. Group products and materials were collected at the end of each of the sessions. In both treatment conditions instructors graded the group products with stickers representing "very good," "good," and "not so good." The grades were not emphasized in order to avoid the possibility that students would cooperate only for the rewards, masking the effects of the variable of interest (i.e., teacher instruction on cooperation).

Research Personnel

Three full-time teachers and a full-time teaching assistant participated in the study. All were employed at the elementary school where the study was conducted. A team of two adults was assigned to each classroom on a randomized basis. One member of the team was designated as the "instructor" for that class, and the other's main responsibility was to assist with noninstructional matters (e.g., gather materials, pass out paper). One instructor was a regular elementary teacher and the other was a special education (TMH) teacher. One assistant was also a special education (TMH) teacher and the other was a teaching assistant in a TMH class. In each condition there was at least one adult with whom all the moderately handicapped students were familiar. To partially control for teacher personality effects, teachers (instructor and assistant) were rotated across treatment groups midway through the study. This permitted equal exposure of both teachers to the treatment conditions.

Prior to treatment interventions, teachers were trained for four hours by the investigator and a teacher highly trained and experienced in the use of cooperative learning procedures. Training sessions focused on maintaining the instructional requirements of the treatment conditions. Scripts for daily lessions were developed for teachers' use by the investigator (see Appendix B for an example). Four observers were trained over a three week period on the use of the Social Interaction Observation System (SIOS), as well as an adapted version of the SIOS used in the present study. During training,

observers coded behaviors by viewing videotapes of handicapped-nonhandicapped peer dyads engaged in leisure/recreation activities. There were two observers assigned to each treatment condition, and they were rotated between treatment conditions in a randomized fashion. The observation order for triads was also prerandomized.

Treatment Conditions

Two treatment conditions were included in this investigation. Each took place in a separate classroom at one suburban elementary school. In condition I, uninstructed on cooperation, students were organized into triads and instructed to work together in completing group science projects. At the beginning of each session the teacher informed students of the task requirements and the evaluation criteria for the particular assignment. During the last five minutes of the scienc activity, students were given feedback on their task performance by the teacher and given an opportunity to discuss matters relating to the task. During the first three to five minutes of each session, the teacher discussed a matter unrelated to the task in order to compensate for the increased amount of teacher instruction in condition II.

In condition II, teacher instructed on cooperation, the instructor performed the steps of the uninstructed treatment, except that s/he informed the students of the cooperative goal structure and gave examples of specific cooperative behaviors s/he expected the students to perform. Teacher instruction included phrases such as

"I'll be watching to see that students say nice things to one another," or "Make sure everyone in your group understands the assignment." After the assignment was made, the teacher monitored student behaviors by indicating frequencies of behaviors on an observation sheet as s/he observed while moving from triad to triad every three or four minutes. This summary sheet was used at the end of each session to help provide feedback to the students on how well they were cooperating. A summary sheet is included in Appendix B. A five minute "processing" session took place after the science activity, in which the teacher gave students feedback on the cooperative behaviors exhibited in the groups and gave students an opportunity to discuss matters related to cooperation. The teacher, for example, might have told the class that s/he heard the members of a particular group say four nice things to one another, or that s/he saw someone explaining the task to another student in order to help him or her understand. The design of this treatment condition followed the model developed by D. Johnson and Johnson (1975), with the exception that teachers did not assign specific roles to students in the groups. See Table 3.1 for a summary of the major activities of the teacher in each treatment condition.

In both treatment conditions, students worked on activities that were designed to promote interdependence and encourage participation of all group members. Each group, for example, usually received only one set of curriculum materials. If they were working on making a group picture, they had one piece of art paper and one box of crayons, or if they were weighing objects, they had only one scale.

The science unit employed was based on the Sink or Float unit by Elementary Science Study (1971). Paper and pencil tasks as well as manipulative tasks were utilized in activities aimed at teaching an understanding of bouyancy and displacement through inquiry-oriented activities. During several sessions, students experimented with objects of different shapes, sizes, and densities to determine whether or not, and why, some objects floated. Students also discovered how to make a ball of clay float; an activity developed in Clay Boats, another unit from Elementary Science Study (1969). Both instructors were given scripts which specifically detailed the instructional format and content of each session (see Appendix B). Both treatment conditions were monitored daily by the investigator to verify that teachers were adhering to the treatment specifications. Feedback was given to teachers regarding the degree of maintenance of the specified treatment condition through formal and informal meetings each morning before school.

Dependent Variables

Dependent variables measured in this investigation were (1) social interaction behaviors during the group science activities, (2) social interaction behaviors during free play sessions, and (3) attitudes of nonhandicapped students toward handicapped persons in general. A measure of achievement was also administered five days after the last instructional day. It was a short, objective test developed by the investigator on the concepts covered in the science unit.

Social interactions during group activities. Social interactions which took place during group activities were measured by direct observation of a predetermined set of interactive behaviors. The observation instrument used was a modification of the Social Interaction Observation System (SIOS), a sign observation system developed by Voeltz, Kishi and Brennan (1981). The SIOS was designed for use with dyads of nonhandicapped and severely handicapped children, and monitors the following seven major classifications of behavior: orientation, affect, position, touch person, objects, play, and vocalizations. Observers focus on one member of a dyad, observe for a brief interval, and then record for a brief interval. Then the other member of the dyad is observed. Over 40 different behaviors are coded on the SIOS. Excellent interobserver agreement has been reported on the SIOS (Voeltz & Brennan, in press). Reliability data for the modified version of the SIOS can be found in Table 4.1. A copy of an SIOS coding sheet appears in Appendix C.

For the purposes of this investigation, the SIOS was modified to fit the particular characteristics and circumstances of the study. Because the majority of the handicapped students were moderately handicapped rather than severely handicapped (only three students had IQs below 35), and the activities had more of an academic emphasis (science activities), it was felt that the "nonhandicapped" portion of the coding system was more appropriate for measuring interpersonal interactions. In particular, the more detailed vocalization category of the SIOS nonhandicapped codes were comment to SPED, approval,

disapproval, question, comment/questions adult, comment/questions peer, talks about, and negative comment to other. In addition, a number of behavior categories on the nonhandicapped portion of the SIOS were deleted because they were not considered to be pertinent to the major purposes of the study (e.g., position or touch person). The final form of the instrument used to observe social interaction behaviors contains the following five major categories of behavior: orientation, affect, objects, activity, and vocalizations, and a total of 23 separate categories. The final list of behaviors used are shown on the sample observation sheet depicted in Appendix C and in Table 3.2.

Because students were working in triads, the directionality of social bids was of interest. Therefore, whether the behavior was directed toward a handicapped student or nonhandicapped student was recorded for some behaviors (see Table 3.2).

Observations were initiated when the teacher started explaining the task. They were terminated when it was announced that it was time for free play. The observation order of triads and order of students to be observed within each traid was randomized. Observers spent five minutes at each triad, observing one student for 10 seconds, recording for 10 seconds, and then observing the next student for 10 seconds. As was mentioned earlier, observers were rotated between the treatment conditions.

Social interactions during free play. Free play interactions of moderately handicapped students only were observed using the 1983

Table 3.2

Adapted Social Interaction Observation System Behavior Categories

Orientation	Affect	Objects	Activity	Vocalizations
Orient $<^{SPED}_{NON}$	Neutral	Demonstrates $<^{SPED}_{NON}$	Appropriate	Comment $<^{SPED}_{NON}$
	Positive	Offers $<^{SPED}_{NON}$	Inappropriate	Comment Other $<^{SPED}_{NON}$
	Negative	Accepts $<^{SPED}_{NON}$	Parallel $<^{SPED}_{NON}$	Disapproval $<^{SPED}_{NON}$
	Distress	Adjusts $<^{SPED}_{NON}$	Cooperative $<^{SPED}_{NON}$	Approval $<^{SPED}_{NON}$
			Interactive $<^{SPED}_{NON}$	Questions
				Negative Comments to Others
				Talks About

NOTE: (1) Diagonal lines indicate directionality of behavior.

(2) Teacher intrusions were also recorded.

version of the Activity Interaction Measure (AIM), developed by the University of Minnesota Cooperative Learning Project (D. Johnson & Johnson, 1983a). During the free play session, observers located handicapped students, observed, and coded interactions. Observations were not timed, although initially a 10 second observe, 10 second record procedure was attempted. This became unfeasible because locating a paricular handicapped student in a group of 24 students often took longer than a few seconds to accomplish. Observers were instructed to look at the student long enough to determine what s/he was doing and with whom, afterwhich they recorded what they saw. Students wore jerseys with large numbers on them which were easily identified by observers. Observation order of students was randomized each day, and observers were rotated between conditions. Observations were terminated when the teacher announced that free play was over. Mutually exclusive behaviors observed were isolation, onlooking, conversing, parallel play, and active participation. Proximity, defined as being within arm's length of another student, was also coded, although it is not mutually exclusive of the other behaviors. The definitions of the behavior categories appear in Appendix C, as do the coding directions given to observers. Heterogeneous (cross-handicapped), and homogeneous interactions were recorded by indicating the number of the person the student was interacting with. Cross-handicapped interaction was not coded for the categories of isolation or onlooking. D. Johnson and Johnson (1983a) report 93% interrater reliability on the AIM, using percentage of agreement for coded categories in calculations.

Attitude assessment. The Acceptance Scale, 1981 version (Voeltz, 1981), was used to assess the attitudes of the regular class students toward handicapped persons. It is a group admininstered opinion questionnaire composed of positive and negative statements about handicaps and individual differences. The version of the Acceptance Scale used was designed for the third to sixth grades. Each statement has a three point response category, "agree," "disagree," and "undecided." Twenty-one questions reflecting "catch phrases" relating to handicaps, such as "I wish I could play with some mentally retarded students," are contained in the scale. Voeltz (1981) labeled the major factors identifying the underlying dimensions measured by the Acceptance Scale as follows: social-contact willingness, deviance consequation, actual contact (wheelchair), actual contact (mental retardation) and mild deviance consequation. Several very easy questions for checking a students' ability to understand and answer the questionnaire are provided as well. If an individual responded incorrectly to these "veridicality" checks, his/her questionnaire was invalidated and not used in the analysis. In the present study, an adult (classroom teacher or the present investigator) read the questions to the students. The questionnaire was administered during the week before (pretest) and after (posttest) the interventions.

Voeltz (1980) reported good test-retest reliability on the scale; the test-retest coefficient obtained for a sample of 50 boys and 51 girls tested on two separate occasions, three weeks apart, was .68. To achieve a measure of validity, a comparison of the mean total

Acceptance Scale scores attained by students who volunteered for a special friends program of structured interactions with severely handicapped students ($\bar{X}$=34.4, SD=3.8) was made with students who did not volunteer for the program ($\bar{X}$=22.3, SD=7.4). The scale's internal consistency for the total sample on the split half (Spearman-Brown corrected) was .82 and the alpha coefficient estimate obtained was .77. On the basis of these findings, it was concluded that there was support for the validity of this measure "as an index of children's attitudes that reflect behavior" (Voeltz, 1982, p. 388).

Analysis

The statistical analysis used to test group differences on the SIOS was a multivariate analysis of variance (SPSS). Sackett, Ruppenthal and Gluck (1978) underscored the fact that the majority of observational studies employ univariate statistics, which apply parametric or nonparametric procedures to each individual code category separately. This practice, however, is inappropriate, as most coding systems are actually multivariate, because some code categories are interrelated dependent variables. Findings on the SIOS observations were further described using univariate student's t-tests. Because of small numbers of subjects (8 moderately handicapped students in each treatment condition) and differing sample variances, the Mann-Whitney U test was used to test differences on free play social interactions, as measured by the AIM. Multivariate and univariate analyses of variance were conducted on the pretest and posttest attitude scores on the Acceptance Scale.

Summary

A group of 32 nonhandicapped fifth grade students and 16 moderately handicapped students from the same elementary school were randomly assigned to two treatment conditions. Both groups worked for 10 sessions on cooperative learning activities, however in one condition (teacher instructed) the teacher instructed the students on cooperative skills and provided specific feedback on students' cooperative behaviors at the end of the sessions. Feedback was also given in the uninstructed condition, however the content was focused only on the science activity. Attitudes of 56 nonhandicapped students toward handicapped peers were assessed before and after the interventions. Observational data were taken on social interaction behaviors during the science activities and during unstructured free play sessions.

CHAPTER IV

RESULTS

The purpose of the present study was to investigate the effects of cooperative skill instruction on (a) the social interaction behaviors of fifth-grade students and elementary level moderately handicapped students and (b) the attitudes of nonhandicapped fifth-grade students toward handicapped persons. Observational data on social interactions during cooperative group activities and unstructured free play were obtained using an adapted version of the Social Interaction Observation System (SIOS) (Voeltz, 1981), and the Activity Interaction Measure (AIM) (D. Johnson & Johnson, 1983a), respectively. Attitudes of nonhandicapped students toward moderately handicapped peers were assessed using Voeltz's (1981) Acceptance Scale. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) programs from the University Computer Center at the University of Minnesota.

Interobserver Agreement

Interobserver agreement for the present study was calculated as percentage of agreement, using the following formula:

$$\text{percentage agreement} = \frac{\text{agreements}}{\text{agreements + disagreements}} \times 100$$

Reliability checks on the six major SIOS behavioral categories were made on three days prior to the intervention and on a daily basis

during the study. Percentage agreement on the average scores of observer pairs ranged from 83% to 100% on the behavioral categories. Reliability checks were made during the first two days of the intervention for the entire duration of the group activity (40 minutes), and during one five minute triad observation (randomly selected) on each subsequent day, for a total of approximately 120 minutes. The lower of the percentage agreement outcomes (83%), which occurred on days 3 and 5, appeared to be the result of an observer failing to record one of the orientation categories during a five minute observation period. Table 4.1 depicts the average daily percentage agreements on the six major SIOS categories for two teams of observers.

Interobserver agreement on free play observations was calculated by comparing two observers' recordings on the AIM for each handicapped student simultaneously observed. Comparisons were not made on the separate behaviors because they occurred with such low frequency. Reliability checks, made on four separate free play observations yielded a percentage of agreement ranging from 79% to 100% for pairs of observers. Average scores for two pairs of observers are reported in Table 4.2.

Social Interaction Observations During Group Activities

Comparisons of behaviors observed in the two treatment conditions (uninstructed and teacher instructed) were made to establish whether or not groups differed on the variables of interest. As mentioned

Table 4.1

Percentage Agreement on SIOS Categories Averaged for Two Pairs of Observers

Behavior Categories	1	2	3	4	5	6	7	8	9	10	Overall Mean
Orientation	88.0	94.5	83.0	93.0	83.0	95.0	91.5	98.5	94.5	100.0	92.1
Affect	96.0	96.5	98.0	100.0	99.0	98.0	99.0	100.0	99.0	100.0	98.6
Objects	100.0	99.0	100.0	99.0	97.0	100.0	100.0	100.0	100.0	100.0	99.5
Activity	93.5	93.5	88.0	88.0	91.0	98.0	100.0	100.0	100.0	100.0	95.2
Vocalizations	96.5	98.0	96.0	97.0	92.0	98.5	98.5	100.0	99.0	98.0	97.4
Intrusion	100.0	100.0	100.0	100.0	96.5	100.0	100.0	100.0	98.0	93.0	98.8

Table 4.2

AIM Percentage Agreement Averaged for Two Pairs of Observers

Day	Pair 1	Pair 2	Average
1	95.5%	83.0%	89.25%
2	92.0%	79.0%	85.50%
6	90.0%	100.0%	95.00%

Note: Pairs did not always consist of the same two observers, as they were assigned randomly to conditions in order to reduce effects of observer bias.

previously, the statistical null hypothesis was that there would be no differences between the two treatment groups on the social interaction behaviors selected for study. Multivariate analyses of variance were performed on the SIOS data using the SPSS MANOVA program. Because some of the behaviors observed occurred very infrequently (sometimes not at all over the ten days in one treatment condition), only those behaviors which had a "reasonable" response rate were selected for analysis. To be included, the average count for each treatment condition had to be greater than .05, occurring about once over the ten days of observation. This cut off point is similar to that used in previous research of this nature (Voeltz, 1983a). The average count is the frequency of occurrence of a particular behavior during five, 10 second observation intervals (one triad observation period) averaged over the total number of triad observations and individuals in a treatment condition for 10 days. Based on this selection criterion, the following variables were used in the analysis: (1) orients to special education student, (2) orients to nonhandicapped student, (3) neutral affect, (4) positive affect, (5) appropriate manipulation of objects, (6) cooperative participation with special education student, (7) cooperative participation with nonhandicapped student, (8) parallel participation, (9) comment to special education student, (10) comment to nonhandicapped student, (11) comment to other, (12) questions, and (13) intrusion. Unfortunately, the SPSS MANOVA program would not permit the removal of nonresponses (coded as zeros) of moderately handicapped students for those three behaviors

they could not exhibit (orient to special education student, cooperates with special education student, and comments to special education student). Handicapped students could only be compared on 10 SIOS variables. Therefore, the following four separate multivariate analyses of variance were conducted: (1) one two-way MANOVA on 10 SIOS variables, grouped by condition and handicap, (2) a one-way MANOVA comparing handicapped students in the two treatment conditions on 10 SIOS variables, (3) a one way MANOVA comparing nonhandicapped students on the 10 SIOS variables, and (4) a one-way MANOVA comparing nonhandicapped students on the 13 SIOS variables. Tables depicting the results of the univariate analyses are contained in Appendix E.

The two-way MANOVA on the 10 variables that pertained to both handicapped and nonhandicapped subjects showed overall significant differences between treatment conditions ($F[10,35]=2.86$, $p=.010$) and significant differences between moderately handicapped students in the two groups ($F[10,35]=5.84$, $p=.000$), but no significant differences in the interaction between these two variables ($F[10,35]=1.87$, $p=.084$).

In light of the statistically significant differences between handicapped subjects in the two groups, it seemed reasonable to conduct separate MANOVAs for nonhandicapped and handicapped students. Two follow-up MANOVA tests on nonhandicapped students were performed; one for 10 and another for the 13 SIOS variables. Both indicated significant differences between treatment conditions; when 10 variables were considered, the approximate F $(10,21)$ was 3.06, $p=.015$; and when 13 variables were considered the approximate F $(13,18)$ was 3.45, $p=.008$.

When observations on moderately handicapped students in the two groups were compared, there were no overall differences between conditions (F[10,5]=.474, p=.853). The results of univariate F tests for the relevant variables are reported in Appendix E.

The p values presented for the multivariate tests discussed should be viewed with caution due to the significant differences in the patterns of variance within the cells of the variance covariance matrix (p=.0004). However, they can still be viewed as indicative of differences between treatments.

The means, t-values, and probabilities for the 32 behaviors observed on the SIOS are depicted in Table 4.3. The presentation of findings on the SIOS is organized with respect to the following six major categories of behavior: orientation, affect, objects, activity, vocalizations, and intrusion. The total frequency of occurrence of each behavior for a student was divided by the number of observation intervals to account for the fact that some students were observed more times than others (due to student absences, class starting a few minutes late, one observer being absent on a particular day, etc.). Each student in a triad was observed for five 10 second periods, followed by 10 seconds of recording after each observation period, after which observers moved to observe another triad. The means reported for each treatment group are the sum of student scores during the 50 seconds of observation, averaged over all ten days.

Orientation

The two behavioral categories relating to orientation (defined as "facing the direction of and/or eyes focused on SpEd or Non") were: (1) orient to special education student and (2) orient to nonhandicapped student. As Table 4.4 demonstrates, significant differences between treatment conditions were found for the first category, orient to special education students ($t[1,30]=-2.83$, $p=.008$). These differences favored the teacher instructed group, in which greater frequencies were observed. There were, however, very small differences between groups on the orientation to nonhandicapped students category. The mean frequency of occurrence was slightly larger for the teacher instructed group.

Affect

Table 4.5 depicts the results on the major category of affect. Of the four affective behaviors observed (neutral, positive, negative, and distress), there were no significant differences between treatment groups. Neutral affect was, by far, recorded most frequently for both groups; the mean frequency per triad observation was 4.29 in the uninstructed group and 4.28 in the teacher instructed group. Negative affect and distress were rarely observed, and statistical tests are, therefore, not meaningful. Positive affect occurred more often than negative affect or distress. Differences between groups were not statistically significant on any of the affect variables.

Objects

Students' manipulations of objects were also infrequently occurring behaviors (see Table 4.6). Two behaviors, accepts from

Table 4.4

T-Tests on Orientation:
Comparisons of Frequencies for Five, Ten Second Periods
Averaged Over Subjects in a Treatment Group

Behavior	Uninstructed $\bar{X}$	Teacher Instructed $\bar{X}$	t-value	df	2-Tail Probability
Orient SPED	.3007	.6400	-2.83	30	.008
Orient NON	.7601	.7465	.10	46	.918

Table 4.5

T-Tests on Affect:
Comparisons of Frequencies for Five, Ten Second Periods
Averaged Over Subjects in a Treatment Group

Behavior	Uninstructed $\bar{X}$	Teacher Instructed $\bar{X}$	t-value	df	2-Tail Probability
Neutral	4.2933	4.2797	.11	46	.910
Positive	.3674	.3154	.61	46	.545
Negative	.0269	.0311	-.16	46	.875
Distress	.0042	.0035	.13	46	.899

Table 4.6

T-Tests on Objects:
Comparisons of Frequencies for Five, Ten Second Periods
Averaged Over Subjects in a Treatment Group

Behavior	Uninstructed $\bar{X}$	Teacher Instructed $\bar{X}$	t-value	df	2-Tail Probability
Demonstrates SPED	.0701	.1055	-.92	30	.366
Demonstrates NON	.0594	.0164	1.90	46	.067
Offers SPED	.0105	.0350	-1.24	30	.230
Offers NON	.0032	.0156	-1.52	46	.138
Accepts SPED	0.0000	.0052	-1.00	30	.333
Accepts NON	.0332	.0068	2.14	46	.041*
Adjusts SPED	.0057	.0097	-.46	30	.651
Adjusts NON	.0076	0.0000	1.45	46	.155

*P value less than .05.

special education student and adjusts for nonhandicapped students, were not observed at all in one or the other treatment condition. Nonsignificant mean differences between groups were found for the following behaviors: demonstrates for special education student, demonstrates for nonhandicapped student, offers to special education student, offers to nonhandicapped student, accepts from special education student, and adjusts for nonhandicapped student. The mean frequencies of occurrence were slightly greater in the teacher instructed condition for the categories of demonstrates to special education student, offers to special education student, offers to nonhandicapped student, accepts from special education student, adjusts for special education student. Somewhat higher frequencies were observed in the uninstructed group for the categories of demonstrates to nonhandicapped student and adjusts for nonhandicapped student. Significant differences between groups were found for the category of accepts from nonhandicapped student ($t[1,46]=2.14$, $p=.041$), favoring the uninstructed treatment condition. No occurrences of accepts from special education student were observed in the uninstructed treatment condition, and no occurrences of adjusts for nonhandicapped students were observed in the teacher instructed treatment condition. Statistical comparisons of groups on these behaviors and many of the behaviors in the "objects" classification are not subject to very meaningful interpretation due to such low frequencies.

Activity

The following six behaviors were included in the Activity classification: appropriate manipulation of objects, inappropriate manipulation of objects, cooperative participation with special education student, cooperative participation with nonhandicapped student, interactive participation with special education student, interactive participation with nonhandicapped student, and parallel participation. As Table 4.7 indicates, significant differences were found between treatment conditions on the category of cooperative participation with special education student, ($t[1,30]=-2.73$, $p=.018$), with more cooperative behaviors observed in the teacher instructed condition ($\bar{X}=.3965$) versus the uninstructed condition ($\bar{X}=.1104$).

The mean for appropriate manipulation of objects, inappropriate manipulation of objects, cooperative participation with nonhandicapped student, interactive participation with special education student, and interactive participation with nonhandicapped student were a bit larger for the teacher instructed treatment condition, while inappropriate manipulation of objects and parallel participation mean frequencies were somewhat greater in the uninstructed treatment condition. Two behaviors did not occur at all in the uninstructed group; they were interactive participation with special education student and interactive participation with nonhandicapped student.

Vocalizations

Ten verbal behaviors were recorded by observers. They were as follows: comment to special education student, comment to

Table 4.7

T-Tests on Activity:
Comparisons of Frequencies for Five, Ten Second Periods
Averaged Over Subjects in a Treatment Group

Behavior	Uninstructed $\bar{X}$	Teacher Instructed $\bar{X}$	t-value	df	2-Tail Probability
Appropriate	1.7191	1.9169	-.87	46	.387
Inappropriate	.0192	.0132	.34	46	.738
Cooperative SPED	.1104	.3965	-2.73	30	.011*
Cooperative NON	.3522	.4410	-.94	46	.353
Interactive SPED	0.0000	.0121	-1.45	30	.158
Interactive NON	0.0000	.0106	-1.79	46	.080
Parallel Participation	1.0915	.9147	1.14	46	.261

*P value less than .05.

nonhandicapped student, comment to other, disapproval of special education student, disapproval of nonhandicapped students, approval of special education student, approval of nonhandicapped student, questions negative comments, and talks about. A significant difference between treatment groups was obtained for the category of comment to special education student ($t[1,30]=-4.48$, $p=.000$). There were very few observed occurrences of disapproval of special education student, approval of special education student, negative comment, and talks about in the uninstructed treatment condition. No approvals of nonhandicapped students were recorded in the uninstructed treatment condition, and no negative comments and talks about were observed in the teacher instructed group. The other verbal behaviors, including comment to nonhandicapped student, comment to other, approval of special education student, and questions all were observed to occur with slightly greater frequency in the teacher instructed group (see Table 4.8).

Intrusion

Intrusions were also recorded, and subsequent analysis revealed significant differences between groups, with more intrusions occurring in the teacher instructed condition ($t[1,30]=-2.20$, $p=.035$). However, the Mann-Whitney U Rank Sum Tests did not show significant differences on this variable. In fact, a 2-tailed p-value was only .512 ($U=256.5$). The test results are thought to be a statistical artifact.

T-tests comparing only moderately handicapped students in the two treatment conditions indicated significant differences between groups

Table 4.8

T-Tests on Vocalizations:
Comparisons of Frequencies for Five, Ten Second Periods
Averaged Over Subjects in a Treatment Group

Behavior	Uninstructed $\bar{X}$	Teacher Instructed $\bar{X}$	t-value	df	2-Tail Probability
Comment SPED	.1919	.8060	-4.48	30	.000*
Comment NON	.5806	.7977	-1.65	46	.106
Comment Other	.1927	.2157	-.38	46	.703
Disapproval SPED	.0057	.0104	-.40	30	.693
Disapproval NON	.0083	.0070	.14	46	.890
Approval SPED	.0057	.0341	-1.74	30	.097
Approval NON	0.0000	.0038	-1.00	46	.323
Questions	.0684	.1226	-1.51	46	.139
Negative Comment	.0038	0.0000	1.00	46	.323
Talks About	.0063	0.0000	1.00	30	.333

*P value less than .05.

on two of the SIOS behavioral categories, appropriate manipulation of objects ($t[14]=-2.38$, $p=.032$) and comment to nonhandicapped student ($t[14]=-2.49$, $p=.026$). As noted previously, the multivariate analysis of variance conducted on moderately handicapped students did not show overall significant differences between groups.

It is important to note that significant differences between groups on the SIOS behavior categories favoring the teacher instructed condition were all positive social interaction behaviors, with the exception of teacher intrusion. In no instances did students in the uninstructed condition exhibit greater frequencies of positive social interaction behaviors.

Social Interactions During Free Play Activities

On each day of the ten days of treatment, students were informed, after the group learning activities, that they had ten minutes for free play activities in the classroom (see script in Appendix B for a description of teacher instructions). Observers recorded specified behaviors of the eight moderately handicapped students, using the Activity Interaction Measure (AIM) (D. Johnson & Johnson, 1983a). The AIM was employed because it was designed to capture behaviors during noninstructional activities, where students are free to move around. It contains behavioral categories indicating degree of involvement in student initiated activities that are not available on the SIOS, such as onlooking or proximity.

The data from the AIM observations were analyzed using the Mann-Whitney U test to determine whether there were differences in the

free play interactions of the moderately handicapped students in the uninstructed treatment condition versus the teacher instructed treatment condition. Initially, t-tests were conducted, but it became apparent that the sample variances of some of the variables were not similar across treatment groups. Given the small sample size (less than 10 per sample), and the unequal variances in treatment groups, the Mann-Whitney U test was employed for the analysis.

Table 4.9 presents the means, standard deviations, U values and 2-tail probabilities of measured free play behaviors in the two treatment conditions.

The average number of intervals for which each student was observed varied somewhat; for the uninstructed group the mean was 25.38 and for the teacher instructed group it was 21.50 (the range was from one to three intervals observed per student for each free play session).

Significant differences between treatment conditions were found for three behavioral categories: onlooking, active participation, and proximity (different numbers of handicapped peers). Observers recorded more instances of onlooking by handicapped students in the uninstructed condition than the teacher instructed condition (U=10.0, p=.021). Proximity with different handicapped peers was also observed with greater frequency in the uninstructed condition (U=4.5, p=.002). Active participation (cooperative play and conversing) occurred significantly more often in the teacher instructed treatment condition (U=7.5, p=.007).

Nonsignificant differences were obtained for the other behaviors on AIM. Means were somewhat higher for the uninstructed group on the following behaviors: isolation, conversing (different number of handicapped peers), parallel play, parallel play (different number of nonhandicapped peers), and active participation (different number of handicapped peers). Means on the following behaviors were slightly larger for the teacher instructed group: conversing (different number of nonhandicapped peers), active participation (different number of nonhandicapped peers), which approached significance at p=.067, proximity, and proximity (different number of nonhandicapped peers).

Attitudes

Attitudes of nonhandicapped students were assessed using the Acceptance Scale, Upper Elementary Level (Voeltz, 1981), during the week prior to and the week after the cooperative group interventions. The tests were administered to nonhandicapped fifth grade students participating in the cooperative group interventions (uninstructed group and teacher instructed group) and a contrast group of fifth grade students not participating in the cooperative group interventions (control group). Tests were administered four weeks apart.

Individual items on a questionnaire were assigned a zero for a "nonaccepting" response, a two for an "accepting" response, and a one for each "maybe" category. Total scores on an individual survey had a possible range from a minimum of 0 to a maximum of 60. Students'

total acceptance scores were used in the computations. Both sets of scores of individuals that were not present for one of the Acceptance Scale administrations or failed to respond correctly to the items used for the veridicality check (items #1 and #13) were not included in the analysis (a total of nine students' scores were dropped).

The SPSS program MANOVA (Multivariate Analysis of Variance) was used to test the pretest-posttest differences among the three treatment conditions. The dependent variables were total pretest and posttest Acceptance Scale scores. Sex and treatment condition were used as grouping factors.

Regardless of treatment condition, females responded more positively to the Acceptance Scale items than males ($F=12.12$, $p<.001$). Although there were no significant differences between treatment conditions on Acceptance Scale scores, there was a trend favoring teacher instructed condition ($F=2.44$, $p=.104$). See Figure 1 and Table 4.10 for a breakdown of scores by sex and treatment group for the pretest and posttest. An analysis of variance was conducted on gain from pretest to posttest, analyzed by treatment groups, and no significant differences were found ($F[2,46]=1.71$, $p=.193$).

The Acceptance Scale results were also analyzed according to four major factors reflecting the following attitudinal dimensions (Voeltz, 1982): social-contact willingness, actual contact, mild deviance consequation, deviance consequation avoidance. (See Appendix D for sample items from the Acceptance Scale associated with each factor.) Factor score means are presented in Table 4.11. Positive scores

Table 4.10

Acceptance Scale Mean Score
According to Treatment Condition and Sex

Condition	Pre	Post	Pre minus Post
Control			
Overall	38.2	34.5	-3.7
Male	36.2	33.9	-2.3
Female	41.4	35.6	-5.8
Uninstructed			
Overall	38.6	33.9	-4.7
Male	33.5	27.8	-5.7
Female	44.6	41.0	-3.6
Teacher Instructed			
Overall	44.4	43.1	-1.3
Male	42.2	39.2	-3.0
Female	46.1	46.0	-0.1

Table 4.11

Acceptance Scale Factor Score Means According to Treatment Condition and Sex

Condition	Factor 1		Factor 2		Factor 3		Factor 4	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Control								
Overall	16.33	14.83	6.72	6.78	5.33	4.39	9.89	8.50
Male	16.00	15.30	5.50	6.10	4.90	4.20	10.00	8.40
Female	16.75	14.25	8.25	7.63	5.88	4.63	9.75	8.63
Uninstructed								
Overall	20.28	16.29	5.00	5.50	5.14	4.64	7.86	7.57
Male	18.63	12.88	3.38	3.88	4.63	4.25	6.88	6.75
Female	22.50	20.83	7.17	7.67	5.83	5.17	9.17	8.67
Teacher Instructed								
Overall	22.07	19.21	7.64	8.29	5.64	5.71	9.21	9.86
Male	22.16	17.83	6.17	7.83	4.83	5.33	9.00	8.17
Female	22.00	20.25	8.75	8.63	6.25	6.00	9.34	11.13
Maximum	26.00	26.00	12.00	12.00	8.00	8.00	14.00	14.00

Notes: Positive scores indicate acceptance.
Factor 1 = Social Contact/ Willingness, Factor 2 = Actual Contact, Factor 3 = Mild Deviance Consequation, Factor 4 = Deviance Consequation.

reflect greater acceptance. All groups' mean factor scores decreased on the dimension of social contact willingness. Overall scores for Factors 2, 3, and 4 (actual contact, mild deviance consequation, deviance consequation avoidance) increased from pretest to posttest in the teacher instructed treatment condition, whereas overall scores decreased for Factors 3 and 4 (mild deviance consequation and deviance consequation avoidance) in the uninstructed and the control conditions. Overall scores of all three treatment conditions increased from pretest to posttest on Factor 2, the actual contact dimension.

Achievement

A posttest was administered to test nonhandicapped students' knowledge of the science concepts taught. Analysis of the results indicated no significant differences between groups ($t[26]=-0.45$, $p=.655$); the uninstructed group mean was 8.64 and the teacher instructed group mean was 8.86.

Summary

The major findings of this investigation are the following:

Social interactions during cooperative group activities

1. The social interaction behaviors of students differed significantly in the teacher instructed and uninstructed treatment conditions.
2. There were significantly greater frequencies of nonhandicapped students orienting to moderately handicapped students, cooperatively participating with moderately handicapped students, and commenting to moderately handicapped students in the teacher instructed treatment condition.
3. Moderately handicapped students engaged in significantly more appropriate participation and commented more often to nonhandicapped students in the teacher instructed treatment condition.

Social interactions during free play activities

4. Moderately handicapped students exhibited significantly greater amounts of onlooking and proximity to different handicapped peers in the uninstructed treatment condition.
5. In the teacher instructed condition moderately handicapped students were engaged significantly more often in active participation (cooperative play and conversing).

Attitudes of nonhandicapped students toward persons with handicaps.

6. The teacher instructed, uninstructed, and control groups did not differ significantly on Acceptance Scale pretest scores or gain scores.
7. Females responded significantly more favorably to the Acceptance Scale items than males.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary and Findings

A promising technique for promoting the social integration of moderately handicapped students is cooperative goal structuring. Although this approach has not been used extensively with moderately handicapped students, there have been a substantial number of investigations on applying this technique with mildly handicapped and nonhandicapped students (D. Johnson, Johnson & Maruyama, 1983). The purpose of this study was to investigate the effects of teacher instruction and feedback regarding cooperation on (a) the social interaction behaviors of nonhandicapped and moderately handicapped elementary school students and (b) the attitudes of the nonhandicapped students toward persons with handicaps.

Cooperative learning groups were used in this investigation because they (a) have been shown to promote greater interpersonal attraction and cross-handicapped liking than individualistic or competitive learning situations (D. Johnson, Johnson & Maruyama, 1983), (b) have potential to foster more horizontal, as opposed to hierarchical (tutor versus tutee), relationships, (c) will enable handicapped and nonhandicapped students to jointly engage in challenging and mutually rewarding activities by completing group products and obtaining joint rewards and (d) they may take place in natural contexts, which are particularly important for fostering the

social skill acquisition and maintenance of mentally handicapped learners.

Most past research on cooperative group learning has compared the effects of cooperative, individualistic or competitive goal structures on peer relations and academic achievement. Cooperative learning groups have been conceptualized and organized in different ways by various researchers, but positive goal interdependence is a common element of most groupings. D. Johnson and Johnson (1975), in particular, have emphasized the role of the teacher in conduction of cooperative learning groups. The goal of the present investigation was to analyze one component of the cooperative goal structure "package," as conceptualized by Johnson and Johnson: the impact of teacher instruction and feedback. Two cooperative learning conditions were compared in this study. They differed on the presence or absence of cooperative skills instruction and feedback. An effort was made to vary groups on this factor only; in all other respects the treatment conditions were similar (e.g., in terms of the task requirements, reward criteria, etc.).

Fourty-eight elementary school students attending an elementary school in a midwestern suburban community constituted the sample of participants in the cooperative group interventions. Of this group, 32 subjects were nonhandicapped students from two fifth grade classes and 16 were moderately handicapped students from three self-contained special education classes. An additional group of 24 students formed a contrast group for attitude assessment, but did not participate in

the cooperative learning activities. Participants were randomly assigned to treatment conditions, stratified by handicap, ability, and sex.

In the uninstructed condition, students were informed by the teacher of the task requirements and at the end of the period were given feedback relating to the task requirements. In the teacher instructed condition, students were also informed of the task requirements, in addition to which they received a short lecture on how to behave cooperatively. Feedback given to this group focused on cooperative behavior. Students in both conditions were given ten minutes of free play time after the group science activities.

Social interaction behaviors during group and free play activities were assessed through behavioral observations, using a modified version of the Social Interaction Observation System (Voeltz, Kishi & Brennan, 1981) and the Activity Interaction Measure (D. Johnson & Johnson, 1983a). Attitudes of nonhandicapped students toward handicapped persons were assessed on the Acceptance Scale (Voeltz, 1981).

In this investigation, it was hypothesized that there would be no significant differences between the teacher instructed treatment condition and the uninstructed treatment condition with respect to (1) social interaction behaviors during cooperative learning activities and free play and (2) attitude score changes of nonhandicapped students. It was also hypothesized that nonhandicapped females would obtain significantly higher scores on the attitude scale than

nonhandicapped males. Results indicate overall significant differences between the two conditions on social interaction behaviors during group activities. The frequency of the following behaviors (occurring with .05 frequency) was significantly greater for the teacher instructed condition: orients to special education student, cooperative participation with special education student, and comment to special education student. In the teacher instructed condition, moderately handicapped students engaged significantly more in the following behaviors: appropriate participation and comment to nonhandicapped student. Observations of behavior during free play interactions indicated that moderately handicapped students were significantly more often engaged in (a) active participation in the teacher instructed condition and (b) onlooking and proximity to different handicapped peers in the uninstructed treatment condition.

With regard to attitude score changes in nonhandicapped students, no significant differences between groups were found. There were significant differences between females and males on attitude scores. Females obtained higher total scores.

Delimitations

For the purpose of this investigation, the following delimitations are to be noted:

1. The model for cooperative groups was a variation of that used by D. Johnson and Johnson (1975). There are other models, some of which minimize the role of the teacher considerably. Also, in

this study, teachers did not assign roles to individual students in the group as was recommended by Johnson and Johnson (1975). Therefore, caution should be exercised when generalizing these results to different models of cooperation.

2. The findings of this investigation are limited to a specific population. Strict random selection of the school and classes was not possible. Classes were selected from a metropolitan area school district which agreed to participate in the study. Handicapped students were selected from three classrooms and on the basis of age and teachers' judgments of a student's ability to meet the minimum requirements of working in small groups. Nonhandicapped students were selected from two fifth-grade classes. The classes chosen for participation by the principal were selected on the basis of whether or not they had completed a science unit similar to the Sink or Float Unit (Elementary Science Study, 1971). Four additional students from another fifth-grade class were randomly selected from a group of 12 volunteers. Students were then randomly assigned to treatments (stratified on handicap, ability level, and sex). Thus, the degree to which this sample is generalizable to fifth-grade nonhandicapped students and moderately handicapped students of this age range is unknown.
3. It is recognized that the size of the sample studied is relatively small. Unfortunately, it was difficult to locate more than sixteen moderately handicapped students in a public

elementary school. It may have been possible, given greater funding resources, to extend this study to another school district. However, by conducting the study in one elementary school, greater control was exerted over task variables, situational variables, and student characteristics. Moreover, treatment group sizes were realistic in terms of actual situations existing in integrated situations in elementary school settings (e.g., 24 students in a classroom).

4. The duration of the present study is a limiting factor. Due to the exploratory nature of this research and the amount of time involved in removing students from their typical activities, it was felt by school administrators that increasing the time demands on the teachers and students involved in the study was unjustified.

5. Only selected dependent variables were compared in this study. Those assessed were social interaction behaviors and social acceptance of handicapped students by nonhandicapped students. Other variables relevant to cooperative learning studies, such as interpersonal attraction, or self-esteem, were not considered and should be researched in future investigations.

Discussion of Major Findings

A major research question of the present study was whether teacher instruction and feedback on cooperation influences the social interaction behaviors of moderately handicapped and nonhandicapped

students engaged in cooperative group learning activities. Analysis of the data on social interactions revealed overall significant differences between the teacher instructed group and the uninstructed group. Those behaviors on the adapted version of the SIOS with at least a five percent occurrence rate were analyzed using multivariate analysis of variance (MANOVA) tests. The specific behaviors upon which groups significantly differed were the following: orients to special education student, cooperative participation with special education student, and comments to special education student. When only nonhandicapped students in the two treatment conditions were compared, groups also differed significantly on parallel play, with greater frequencies occurring in the uninstructed condition. In addition, when moderately handicapped students in the two groups were compared, significant differences were found for the categories of appropriate manipulations and comments to nonhandicapped student. (See Apendix E for the results of the Univariate F tests comparing nonhandicapped students or handicapped students in the two conditions.)

For those behaviors that are considered to be desirable forms of social interaction, significant differences between groups favored the teacher instructed condition. In this condition, nonhandicapped students generally initiated more interactions with handicapped students by looking at them, making comments to them, and working cooperatively with them. In the uninstructed condition, nonhandicapped students were involved in more parallel play, which is

not, from the standpoint of promoting positive interactions, as desirable as cooperative play because it involves no active involvement with another student. Nonetheless, it is certainly preferable to students engaging in unrelated activities or passive behaviors.

There was a strikingly low level of occurrence for a number of the behaviors measured by the modified SIOS observation instrument. Although these behavior categories were omitted from the multivariate analysis, their infrequency merits explanation. One possible cause may have been the manner in which the SIOS behaviors were observed. Because observers focused on one triad for five minutes, they only observed each triad for a maximum of two times per session. This method of gathering observational data was based on the rationale that observers would have difficulty locating students if they moved to another triad after 10 seconds of observation and 10 seconds of recording on one student. Perhaps this sampling approach was not sufficient for measuring infrequent or momentary behaviors and actually failed to capture occurrences.

Another possible explanation for infrequently occurring data is that these particular behaviors may not happen very often in the cooperative group activities structured for this investigation. Behaviors that were rarely observed (less than 5% of the time) were the following: negative affect, distress, all of the behaviors in the objects category (demonstrates, offers, accepts, adjusts), inappropriate manipulation of objects, and disapproval, approval, negative comment, and talks about in the verbalization category.

As can be seen, there were very few recorded instances of negative behaviors throughout this study. On the first day of the intervention in the uninstructed treatment condition, a teaching assistant reported that two nonhandicapped students were laughing at the moderately handicapped student (a girl with Down syndrome). Fortunately, the handicapped student seemed to think they were laughing with her, not at her. The teacher responsible for that class spoke to the two students privately about the incident later in the day, and it never happened again. Interestingly, there were no instances of negative comment or talks about special education student observed in the teacher instructed condition and very few in the uninstructed condition. Perhaps the fear that handicapped students will be openly ridiculed and rejected by nonhandicapped peers, sometimes expressed by those who oppose social integration of handicapped students, is not well founded, especially for those situations in which integration procedures are being properly implemented. On the other hand, it would be unnatural if at least a few "negative" behaviors did not occur. It is possible that if nonhandicapped students are too "nice" to their moderately handicapped peers, the behavior may actually be a form of preferential (perhaps even patronizing) treatment, reflecting a lack of genuine acceptance.

The low rate of reported instances of behaviors in the objects category (demonstrates, offers, adjusts, accepts) was another interesting and unpredicted finding. It might be speculated that by rarely exhibiting these behaviors in cooperative group activities,

students are functioning in a more egalitarian mode, as opposed to hierarchical mode (where teacher/student or tutor/tutee roles are assumed). In contrast to peer tutoring situations, it is preferable that students do not become too didactic in cooperative group activities, as they are expected to in peer tutoring situations. Certainly, if tasks can be accomplished through cooperative or interactive participation, without a lot of demonstration, or adjusting, for example, students may function on a more equal basis in their interpersonal interactions. If, however, handicapped students cannot participate maximally in a task because they do not understand the task requirements or cannot access the materials, teachers may want to specifically encourage nonhandicapped students to engage in behaviors such as demonstrating, adjusting, or offering. A comparison of the effects of peer tutoring and cooperative learning situations on the types of behaviors exhibited by nonhandicapped students is a topic worthy of future investigation.

An important issue in the research on techniques for facilitating the social integration of handicapped students is the degree of generalization or carry over of effects after the implementation of the structured intervention. To address this issue in this investigation, the social interactions of moderately handicapped students during post instructional free play sessions were observed using the AIM. Findings lend some support to "carry-over" effects of the treatment conditions. For example, students exposed to teacher instruction and feedback regarding cooperation were engaged

significantly more in active participation during free play. Active participation also occurred more often with nonhandicapped peers in the teacher instructed treatment condition (although this difference only approached significance.) On the other hand, handicapped students in the uninstructed condition were found to be engaged more often in onlooking, passively watching the activities of other students. The students in the uninstructed condition also located themselves closer to other handicapped, rather than nonhandicapped, peers. Statistically nonsignificant differences between groups were found on the categories of isolation, conversing, and parallel play.

Upon visiting each classroom during free play on the first day of the intervention, this investigator did not witness any moderately handicapped students in conversation, parallel play, or active participation with nonhandicapped students in the uninstructed condition. The situation was quite different in the teacher instructed condition; students were all interacting in some way with their nonhandicapped peers (e.g., conversing in active participation or parallel play). Based on this subjective observation, it might be speculated that it is very important for teachers to initially set forth clear behavioral expectations when conducting activities with heterogeneous groups of children, especially when students are unfamiliar with one another.

An even more stringent test of generalization of the effects of cooperative goal structuring would be to monitor social interactions in situations that are removed from the instructional situation in

terms of time, space, and teacher influence. One might assess interaction on the playground, lunchroom, while waiting for the bus after school, or in community settings, for example.

The results obtained on measures of nonhandicapped students' attitudes toward persons (male and female) with handicaps were consistent with past research in terms of showing significant sex differences on attitude outcomes. Females obtained higher (more positive) total scores on the Acceptance Scale than males. There were no overall significant differences between the teacher instructed, uninstructed, and control groups on pre and post Acceptance Scale scores, analyzed together by multivariate analysis of variance. However, unvariate tests indicated significant differences on posttest scores, with highest scores (more positive) in the teacher instructed condition and lowest scores in the uninstructed condition. Groups did not differ significantly on the pretest scores. The average loss (nonsignificant) of groups on the Acceptance Scale was another unexpected finding which might be explained in several ways. First, the length of time between pretest and postest was only four weeks. This short period of time was probably insufficient to detect substantive changes in students' attitudes toward handicapped persons. Administering the Acceptance Scale twice over such a short time interval may have actually functioned similiarly to a test-retest situation. The mean overall losses in the teacher instructed (from 44.4 to 43.1), control condition (from 38.2 to 34.5), and the uninstructed condition (from 38.6 to 33.9), may have been close to the

expected range of variation for test-retest results on the Acceptance Scale. However, overall scores were higher than those pretest and posttest scores obtained by Voeltz (1982) in Hawaii. Thus, another factor influencing results on the Acceptance Scale may have been the initially high scores on the pretest. Some students' scores were close to the "ceiling," and could hardly increase from pretest to posttest, whereas almost any student's score could decrease by a substantial amount.

Another possible explanation is that the results on the attitude assessment may also indicate that even when students behave quite positively in novel situations with handicapped persons (e.g., cooperative learning situations) attitudes do not necessarily change in a similar direction. Thus, changing attitudes may be a more difficult task to accomplish than changing social interaction behavior.

Implications for Future Research

The results of this study lend support to the use of teacher instruction and feedback on cooperative skills in cooperative learning activities to facilitate positive social interactions between handicapped and nonhandicapped peers. Based on the outcomes of this investigation, a key question which arises is "how do these particular instructional behaviors influence social interactions?" There are several things that are taking place when the teacher instructs and gives feedback on cooperation, as specified in D. Johnson and

Johnson's (1975) model. First, the teacher is setting specific behavioral expectations and modeling appropriate interpersonal behaviors for the students. Secondly, s/he issues rewards and punishments, and sets contingencies for all types of classroom behavior (e.g., academic performance, interpersonal behavior). It is quite natural for students to comply with specified expectations in order to obtain implicit or explicit rewards (e.g., grades, social reinforcement). Moreover, when teachers monitor, record, and provide feedback on social interactions, students are continually being reminded of the behavioral expectations previously set forth. Students' awareness of the fact that their social interactions are being monitored most likely makes them feel more accountable for their behaviors. Unfortunately, the separate contributions of teacher instruction versus teacher monitoring and feedback to the effects of the teacher instructed treatment condition could not be determined in the present investigation. An interesting topic for future research might be the relative effects on social interactions of "setting up" cooperative groups with teacher instruction on cooperation after which the teacher withdraws physically, versus the same procedure with ongoing monitoring and feedback. Should both be used only in combination? Would it suffice to only provide initial instruction on cooperation, when groups are first formed? Do teachers need to remind students each day of the behavioral expectations on cooperation? What is the impact of student discussion on cooperation?

Another matter worthy of future inquiry, but not featured in this

investigation, is the impact of cooperative learning groups on academic performance. In this investigation, no significant differences on achievement of nonhandicapped students in the two treatment conditions were found. Little objective information was obtained on the achievement of the handicapped students, although teachers reported subjectively that moderately handicapped students improved in their academic and social skills. Madden and Slavin's (1982) approach, in which individualization within cooperative groups is advocated, appears to be a very promising technique for mainstreaming and the social integration of mentally handicapped students, because all students are not required to perform on the same level, and progress on individualized skill objectives is not sacrificed for any student. Clearly, cooperative learning groups provide an ideal context in which to enhance social skill acquisition and maintenance of moderately handicapped students.

A component of the cooperative goal structuring that was not systematically studied in this investigation, but may have been an important factor influencing outcomes, was the science task. The physical science domain, specifically the Sink or Float Unit, seemed to be ideally suited to cooperative group interventions because the tasks so easily accomodated students of varying ability levels. In all of the lessons, there was something each group member could do, regardless of intellectual capability. In the lesson on Clay Boats (Elementary Science Study, 1969), for example, students were involved in activities such as shaping the clay, putting weights in the boat,

and recording the experiment. Most of the moderately handicapped students could not record the results of the experiment (although several did), yet they could all shape and load the clay boats. By combining art activities with the science lessons, handicapped students could "document" or describe what they learned (e.g., through the sink or float mural), even when they were unable to read or write. In addition, the activities were multisensory, and easily adapted to the needs of students with sensory impairments (e.g., visual or auditory impairments). Investigation on task variables in cooperative goal structuring would be an important topic for future studies.

Regarding the assessment of social interaction outcomes, Voeltz and Brennan (in press) noted that researchers have been overly restrictive in their evaluation approaches. This investigation was no exception. The use of the Acceptance Scale as the only measure of attitude change most likely gave a very limited perspective on the impact of the cooperative groups on nonhandicapped students' perceptions of persons with handicaps or the specific handicapped students participating in the study. Unfortunately, school personnel felt, at the time of the study, that it would not be wise to have nonhandicapped students rate the moderately handicapped students on an "I like to work with" dimension. The behavioral observations on students in cooperative groups and free play activities, however, provided very rich information on interpersonal interactions in several contexts. Future investigations would benefit from the use of multiple evaluation measures, including rating scales on attitudes,

measures of self-concept, and measures of perceptions of the classroom climate.

Rynders et al. (1980) made the point that the cooperative goal structure implemented in the bowling study seemed to have a strong impact upon interpersonal behaviors, while such a strong influence did not occur with respect to attitudes. The results of the present study support that conclusion; the impact of teacher instruction on cooperation was most evident with respect to student behaviors. Interventions may have to occur over a much longer time period and in multiple contexts to have a similarly positive impact on attitudes.

The results of this study indicate that teaching nonhandicapped and moderately handicapped students how to get along in small group activities is likely to enhance interpersonal interactions. Teacher monitoring of group behavior and provision of feedback appear to be a vital part of this process. At present, there are many aspects of the cooperative goal structuring technique and its effect on peer relations and student achievement which have yet to be explored. The results of the present study are justification for continued research and development on this topic.

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APPENDIX A

Samples of Parent Permission Letters

Madison Elementary School

650 Territorial Road NE
Blaine, Minnesota 55434
1-612-784-1340

William Gallagher, Principal

March 7, 1983

Dear Parents:

Your child's teacher, Herb Parker, has been invited to participate in a teaching improvement project. Under the direction of Ms. JoAnne Putnam and Dr. John Rynders from the University of Minnesota, an observational study will be conducted during the period of April 4 through April 18, 1983. The nature of instructional methods used by Mr. Parker and three other teachers in conducting cooperative learning activities and their effects on students' interactions will be studied.

We plan to have one handicapped and two nonhandicapped students work in small groups of three for science and art activities. These activities are based on discovery learning and are designed to involve learners at different ability levels. The study will take place over a two-week period (ten sessions) and each lesson will last approximately 45 minutes.

As a student in Mr. Parker's class, your child occasionally will be observed during and following instructional periods. Questionnaires concerning attitudes toward handicapped students and students in the small group will be given several times.

Participation in this project will not disrupt your child's involvement in the regular educational program. It is expected that students will increase their knowledge and improve their skills as a result of their participation in this science and art unit. We also anticipate that handicapped students and nonhandicapped students will benefit from working and interacting together, hopefully increasing their social interaction skills and understanding of one another.

All information gathered will be used for research only. Your child's name will be kept confidential at all times and will not be used in any part of the study. Our purpose is not to evaluate your child but to evaluate the effects of different teaching methods. As a result of your child's participation, we hope to obtain valuable information to improve teaching methods.

If you have any questions or concerns, please feel free to call Ms. JoAnne Putnam of the University of Minnesota at 729-2982 (home) or 373-5608 (leave message), or Mr. Gallagher at 784-1340. Please return the attached form to us at your earliest convenience. Thank you.

Sincerely,

Jo Anne W. Putnam

JoAnne W. Putnam
University of Minnesota

William Gallagher

William Gallagher, Principal
Madison Elementary School

Herb Parker
Madison Elementary School

WG/aw/DsS

Attachment

Anoka-Hennepin
Independent School District No. 11
11299 Hanson Boulevard NW • Coon Rapids, MN 55433
Dr. Lewis Finch, Superintendent

Madison Elementary School

650 Territorial Road NE
Blaine, Minnesota 55434
1-612-784-1340

William Gallagher, Principal

March 7, 1983

Dear Parents:

Your child's teacher, Julie Haak, has been invited to participate in a teaching improvement project. Under the direction of Ms. JoAnne Putnam and Dr. John Rynders from the University of Minnesota, an observational study will be conducted during the period of April 4 through April 18, 1983. The nature of instructional methods used by Ms. Haak and three other teachers in conducting cooperative learning activities and their effects on students' interactions will be studied.

We plan to have one handicapped and two nonhandicapped students work in small groups of three for science and art activities. These activities are based on discovery learning and are designed to involve learners at different ability levels. The study will take place over a two-week period (ten sessions) and each lesson will last approximately 45 minutes.

As a student in Ms. Haak's class, your child occasionally will be observed during the following instructional periods. We would like to view students' record folders and ask the teacher to assist us in determining your child's general ability level.

Participation in this project will not disrupt your child's involvement in the regular educational program. It is expected that students will increase their knowledge and improve their skills as a result of their participation in this science and art unit. We also anticipate that handicapped students and nonhandicapped students will benefit from working and interacting together, hopefully increasing their social interaction skills and understanding of one another.

All information gathered will be used for research only. Your child's name will be kept confidential at all times and will not be used in any part of the study. Our purpose is not to evaluate your child but to evaluate the effects of different teaching methods. As a result of your child's participation, we hope to obtain valuable information to improve teaching methods.

If you have any questions or concerns, please feel free to call Ms. JoAnne Putnam of the University of Minnesota at 729-2982 (home) or 373-5608 (leave message), or Mr. Gallagher at 784-1340. Please return the attached form to us at your earliest convenience. Thank you.

Sincerely,

JoAnne W. Putnam
University of Minnesota

William Gallagher, Principal
Madison Elementary

Julie Haak
Madison Elementary

WG:al
Attachment

Anoka-Hennepin
Independent School District No. 11
11299 Hanson Boulevard NW • Coon Rapids, MN 55433
Dr. Lewis Finch, Superintendent

Madison Elementary School

650 Territorial Road NE
Blaine, Minnesota 55434
1-612-784-1340

William Gallagher, Principal

March 7, 1983

Dear Parents:

We would like to have the students in the fifth grade participate in a study on attitudes toward handicapped children. Under the direction of Ms. JoAnne Putnam from the University of Minnesota, the teachers will distribute an attitude survey which takes about 25 minutes to complete. The questionnaire will be administered twice during April.

The information gathered will be used for research purposes only. Your child's name will not be used. All data is totally confidential. As a result of your child's participation, we hope to obtain valuable information to improve students' understanding of one another.

If you have any questions or concerns, please feel free to call Ms. JoAnne Putnam at 729-2982 (home) or 373-5608 (leave message).

Sincerely,

JoAnne W. Putnam
University of Minnesota

William Gallagher, Principal
Madison Elementary School

WG/aw/DsS

Anoka-Hennepin
Independent School District No. 11
11299 Hanson Boulevard NW • Coon Rapids MN 55433
Dr Lewis Finch, Superintendent

APPENDIX B

Science Lesson Sequence

Teacher Scripts for Treatment Conditions

Cooperative Skills Checklist

SCIENCE LESSON SEQUENCE

Day

1. Group names, listing objects that float and sink.
2. Group pictures, "experiment" with floating and sinking objects.
3. Making a one-ounce ball of clay float (shape).
4. Loading the boats (weight).
5. Read about early boats, worksheet, cut out boat for a picture, free play.
6. Constructing boats from different materials, compare aluminum foil and clay.
7. Review. Make a boat college.
8. Using a balance, order objects by weight (density).
9. Weighing objects and displace in water (displacement, bouyancy). Review.
10. Final test and free play.

Teacher Instructed Condition

Lesson 1: Creating a Group Name and Listing Floating and Sinking Objects

Objective: Develop group cohesion. Identification of objects that sink and float.

Time: 45 minutes.

Getting Set Up: 10 minutes.

Materials: One folder per group, worksheet, pencils, extra paper.

Introduction to Cooperative Groups: Today we will be working in groups called cooperative groups. Cooperative groups may differ from other groups you have worked in because the emphasis is on reaching a common goal. Today your common goal will be to select a group name and fill out a worksheet later. Cooperation means more than taking turns, it means you will be working on the assignments together. It is important in cooperative groups to share your own thoughts and ideas as well as listen carefully to what others are saying. It is also very important to help the other members of your group to understand what you are trying to do in your group.

Task Statement I: How many of you have been swimming or have been on

a lake, river, or ocean? Well, we are going to be talking about water and what it can do for the next two weeks. First, I would like you to think of a name for your group. Try to make the name have something to do with water. You have ten minutes to do this. You may use the extra paper in your packet to write your name on.

Goal Structure: Think of as many names as you can in the first few minutes. Everyone in your group should give at least one suggestion for the group name. Then, choose a name that everyone is happy with. Everyone has to agree on the name. Check with each member of the group to make sure that s/he agrees with the name. Then, write the name on your paper. Sign your name on the paper when all have agreed on the name.

Behaviors: I will especially be watching to see that:

1. Everyone understands what needs to be done.
2. Everyone takes part in the activity.
3. One person is talking at a time.
4. You all agree on the group name.

Criteria: You will be successful when you have selected a group name and have written it on your paper.

Evaluation: Based on the name on the folder.

AFTER FIVE MINUTES OF WORK TIME, TELL THE STUDENTS TO FINISH UP BECAUSE THERE IS ANOTHER TASK TO GO ON TO.

Task Statement II: Now that you have a group name, you're going to fill out a worksheet by making a list of things that float on top o' the water and things that sink. Try to list as many things as you can. There are two headings on the worksheet. List your items under the correct heading. You only have one sheet for the group to fill out.

Goal Structure: You will be working in your groups. Everyone should give ideas of what objects float and sink. Make sure each person understands what needs to be done and suggests at least one thing that floats or sinks. Everyone has to agree on your final choices of floating and sinking objects. One person should write down the answers, he or she will be the recorder. After everyone agrees with the answers, write your name at the bottom of the page.

Criteria: You will be successful when you have filled in all (or most of) the blanks on the worksheet and everyone has signed off. You will receive a group grade of very good, good, or not so good, depending upon how many blanks you filled in.

Behaviors: I will especially be watching for your:

1. Getting ideas from everyone.
2. Checking to make sure everyone agrees.
3. Trying to make sure everyone understands.
4. Saying nice things (give examples from the posters!)

Evaluation: Completed papers, teacher observation.

Intervention: Check to make sure the groups are functioning cooperatively. Do not disrupt the groups unless it is necessary. Basically, you want to be unobtrusive and watch and record what is occuring. Fill in the cooperative skill check list.

Process: Take a few minutes to sum up the positive things you saw while monitoring (e.g., "I really saw a lot of nice things happening today. People were really listening to each other and I like the way you included everyone in the group"). You may ask the groups if there were any major problems occuring in their groups, but try to avoid dwelling on negative behavior and focus on the positive. (See description of "processing" for further guidance).

Free Play: You now have ten minutes of free time before class is over. Feel free to leave your desks, move around the room, and talk with others. I would prefer that you not read books or draw pictures. This is a time to stretch, talk, and move around.

PROCESSING

Cooperative

For the first week the teacher will want to take about 5 minutes at the end of each day to process. Ask each group to report on one nice thing that happened in their group that day. You may want to precue them to this when you set up the goal structure; tell them ahead of time that you will be asking each group what good things happened during the lesson. You will also want to process informally with each group during the lesson. As you walk around the room checking to see how each group is doing ask them how they are feeling about working together and whether anything nice happened. If you see anything nice happening, reinforce it right away. Before you ask each group at the end of the period how things went, you might want to take a minute to sum up the good things you have seen today. ("I really saw a lot of nice things happening today. People were really listening to each other and I like the way you included everyone in the group . . ."). After asking the groups if there was a major problem that was occurring in each group you may want to point that out but stay away from negatives as much as possible.

Uninstructed Condition

Lesson 1: Creating a Group Name and Listing Floating and Sinking Objects

Objective: Develop group cohesion. Identification of objects that sink and float.

Time: 45 minutes.

Getting Set Up: 10 minutes.

Materials: One folder per group, worksheet, pencils, extra paper.

Introduction to Cooperative Groups: Today we will be working in groups called cooperative groups. Cooperative groups may differ from other groups you have worked in because the emphasis is on reaching a common goal. Today your common goal will be to select a group name and fill out a worksheet later.

Task Statement I: How many of you have been swimming or have been on a lake, river, or ocean? Well, we are going to be talking about water and what it can do for the next two weeks. First, I would like you to think of a name for your group. Try to make the name have something to do with water. You have ten minutes to do this. You may use the extra paper in your packet to write your name on.

Criteria: You will be successful when you have selected a group name and written it on your paper.

Evaluation: Based on the name on the folder.

AFTER FIVE MINUTES OF WORK TIME, TELL THE STUDENTS TO FINISH UP BECAUSE THERE IS ANOTHER TASK TO GO ON TO.

Task Statement II: Now that you have a group name, you're going to fill out a worksheet by making a list of things that float on top of the water and things that sink. Try to list as many things as you can. There are two headings on the worksheet. List your items under the correct heading. You only have one sheet for the group to fill out.

Criteria: You will be successful when you have filled in all (or most of) the blanks on the worksheet and everyone has signed off. You will receive a group grade of very good, good, or not so good, depending upon how many blanks you filled in.

Evaluation: Completed papers, teacher observation.

Intervention: Check to make sure the groups are functioning appropriately. Do not disrupt the groups unless it is necessary. Basically, you want to be unobtrusive and watch and record what is occuring.

Process: Take a few minutes to sum up the positive things you saw while monitoring related to working on the task (e.g., "I really saw a lot of nice things happening today. People were really

working on their projects and got a lot accomplished."). You may ask the groups if there were any major problems occuring in their groups, but try to avoid dwelling on negative behavior and focus on the postive. Remember, the focus of processing is the science activity.

Free Play: You now have ten minutes of free time before class is over. Feel free to leave your desks, move around the room, and talk with others. I would prefer that you not read books or draw pictures. This is a time to stretch, talk, and move around.

Cooperative Skills Checklist

Group _____

Date _____

SKILLS / NAMES									
CHECKS FOR UNDERSTANDING									
PRAISES									
ENCOURAGES									
TAKES TURNS									
SHARES IDEAS									
IS EVERYONE PARTICIPATING?									

APPENDIX C

Observation Categories, Definitions, and Protocols

Social Interaction Observation System

Investigator's Adaptation of the Social Interaction Observation System

Activity Interaction Measure

SIOS Definitions

NON-HANDICAPPED (NON)

ORIENTATION--Attention

ORIENT TO SPED: Facing direction of and/or eyes focused on SPED, attention directed toward SPED for 3 seconds or more

ORIENT TO OBJECT: Facing direction of and/or eyes focused on target object, attention directed toward target object (e.g., toy, puzzle, etc. to be manipulated) for 3 seconds or more

ORIENT AWAY FROM SPED OR OBJECT: Facing direction of and/or eyes focused on any other person or object other than SPED or target object (object to be manipulated) for 3 seconds or more

AFFECT

NEUTRAL: No discernable expression

POSITIVE: Eyes brighten and corners of mouth curve upward

NEGATIVE: Wrinkling of brow and/or mouth turned downward

DISTRESS: Frowning and/or tensing of face and neck

POSITION

Area occupied by an individual or physical arrangement of non-handicapped child

CLOSE TO SPED: Positioned within arm's reach of SPED

FAR FROM SPED: Positioned out of arm's reach of SPED

FRONT OF SPED: Positioned directly facing SPED

SIDE OF SPED: Positioned to right/left of SPED

BEHIND SPED: Positioned in back of SPED

MOVEMENT: Changing position or posture and/or going from one area to another

TOUCH--Person

NONE: No Physical contact with SPED

ACCIDENTAL/NEUTRAL: Physical contact occurring by chance

ATTENTION-SEEKING: Physical contact so that SPED will attend to Non

COMFORTS: Physical contact which attempts and/or appears to encourage, cheer, or ease sadness (3 seconds or more)

GUIDANCE/POSITIONING: Physically directing or redirecting a movement of SPED; putting in position or changing position/posture of SPED

POSITIVE: Physical contact which appears affectionate and may express other similar emotions (1 second or more)

NEGATIVE: Physical contact which appears hostile (e.g., withdrawal) and may oppose constructive interaction (1 second or more)

OBJECTS

NONE: No objects or materials present other than necessary furniture

NON CONTACT: Objects or materials present but no physical contact between NON and objects

DEMONSTRATES: Manipulating objects or materials to illustrate activities, task, etc.

OFFERS: Presents, gives, hands over objects or materials to SPED

ACCEPTS: Receives objects or material from SPED

ADJUSTS: Manipulating objects or materials to a specific position to make accessible to SPED, holding objects steady for SPED

PLAY

APPROPRIATE:	Manipulating objects or materials in the correct way or the way they were meant to be handled
INAPPROPRIATE:	Manipulating objects or materials in an incorrect or unsuitable manner
PARALLEL PLAY:	Plays with same objects or materials independently from SPED
COOPERATIVE PLAY:	Plays with same objects or materials, engages in same activity as SPED at the same time
INTERACTIVE PLAY:	Plays with same objects or materials as SPED at same time but must take turns

VOCALIZATIONS

NONE:	Total lack of vocalizations to SPED
ATTENTION-SEEKING/ NEUTRAL MIND:	Vocalizing to get SPED to attend (e.g., calling name); instructional/attention-seeking sign or gesture, instructional verbal command with no discernable effort
COMMENT TO SPED:	Neutral vocalizations, remarks to SPED
APPROVAL:	Vocalizations which express positive reinforcement, (e.g, "Good," "Nice work," etc.)
DISAPPROVAL:	Vocalizations which express negative emotions; may or may not chastise SPED
QUESTION:	An interrogative sentence directed to SPED, peer, adult
COMMENT/QUESTIONS TO ADULT:	Vocalizations or remarks to adult in vicinity
COMMENT/QUESITONS TO PEER:	Vocalizations or remarks to peer in vicinity
TALKS ABOUT:	Comments about SPED to others (peers, adults, etc.) within hearing distance of SPED

NEGATIVE COMMENTS TO OTHERS:	Vocalizations or remarks to others which indicate or express disapproval, refusal, etc.
SINGING:	Producing musical tones by means of the voice directed at SPED
LAUGHING:	Vocalizations usually accompanied by broad smiling, which expresses positive emotions (e.g., happiness, joy)

DEFINITIONS OF SIOS BEHAVIOR OBSERVATION CATEGORIES UTILIZED IN THE PRESENT STUDY

ORIENTATION--Attention

ORIENT SPED/NON: Facing direction of and/or eyes focused on SPED and/or NON, attention directed toward SPED and/or NON for 3 seconds or more

AFFECT

NEUTRAL: No discernable expression

POSITIVE: Eyes brighten and corners of mouth curve upward

NEGATIVE: Wrinkling of brow and/or mouth turned downward

DISTRESS: Frowning and/or tensing of face and neck

OBJECTS

DEMONSTRATES: Manipulating objects or materials to illustrate activity, task, etc.

OFFERS: Presents, gives, hands over objects or materials to SPED and/or NON

ACCEPTS: Receives objects or materials from SPED and/or NON

ADJUSTS: Manipulating objects or materials to a specific position to make accessible, or holding objects steady for SPED and/or NON

ACTIVITY

APPROPRIATE: Manipulating objects or materials in the correct way or the way they were meant to be handled

INAPPROPRIATE: Manipulating objects or materials in an incorrect or unsuitable manner

PARALLEL: Manipulates with same or similar objects or materials independently from SPED and/or NON

COOPERATIVE: Manipulates with same or similar objects or materials, engages in activity as SPED and/or NON at the same time

INTERACTIVE: Manipulates with same or similar objects or materials as SPED and/or NON at the same time but must take turns

VOCALIZATIONS

APPROVAL: Vocalizations which express positive reinforcement, (e.g., "Good," "Nice work," etc.)

DISAPPROVAL: Vocalizations which express negative emotions; may or may not chastise

QUESTION: An interrogative sentence directed to SPED, peer, adult

TALKS ABOUT: Comments about SPED to others (peers, adults, etc.) within hearing distance of SPED

NEGATIVE COMMENTS TO OTHERS: Vocalizations or remarks to others which indicate or express disapproval, refusal, etc.

COMMENT: Neutral, identifiable vocalizations directed to SPED or NON

COMMENT TO OTHERS: Neutral, identifiable vocalizations not directed to SPED or NON. (P to peer, T to adult, or no one)

INTRUSION: Teacher intervenes verbally or by manipulating objects or materials

ACTIVITY INTERACTION MEASURE*

These are mutually exclusive categories.

ISOLATION

The target student is engaged in some individual activity which is not in the immediate proximity of another student. Unoccupied behavior is also included in this category. Unoccupied behavior occurs when the student does not appear engaged or interested in any activity. The student may be wandering aimlessly around the room, following the teacher, or sitting or standing in one location. The student does not watch, approach, or initiate contact with other students.

ONLOOKING BY THE TARGET

Onlooking is defined as the target passively watching the activities and behaviors of other students, and the target student is not walking with anyone.

CONVERSING

Students are engaged in talk, with no active play or movement behavior.

PARALLEL PLAY

Another child is playing with same or different materials as the target child (such as sitting next to each other or standing next to each other at blackboard). Children do not engage in conversation. If sharing materials but not talking, this would also be parallel play. If child is in active participation with another child, they cannot be coded in parallel play with the target.

ACTIVE PARTICIPATION

Any type of play or interaction with the target child that involves movement or is active and includes conversing.

PROXIMITY

Student(s) is (are) within an arm's length of target. (This category is not mutually exclusive of the other categories.)

*Roger and David Johnson

Type of Observation

_____ Primary
_____ Reliability
_____ Videotape
_____ Practice in Vivo
_____ Condition

Group_____
Observer's Name_____ Date_____
Code_____ Day_____
With_____ Minute_____
Tallied_____ By_____

Student # / Interval	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ORIENTATION															
Orient to SPED															
Orient to NON															
AFFECT															
Neutral															
Positive															
Negative															
Distress															
OBJECTS															
Demonstrates	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
Offers	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
Accepts	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
Adjusts	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
ACTIVITY															
Appropriate															
Inappropriate															
Parallel															
Cooperative	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
Interactive	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
VOCALIZATIONS															
Comment	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
Comment Other															
Disapproval	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
Approval	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n	S n
Questions															
Negative Comments to Others															
Talks About															
INTRUSION															

revised 2/83

ACTIVITY INTERACTION MEASURE

Target # _____ Condition _____

tallied _____ checked _____
data _____ OR reliability with _____

Date	Observer	Isolation	Onlooking	Conversing	Active Participation	Proximity Arm's Length	Parallel Play	Comments
TOTALS:	ACTIVITIES							
	DIFFERENT PEERS							

APPENDIX D

The Acceptance Scale

ACCEPTANCE SCALE
1981 version

UPPER ELEMENTARY LEVEL. Grades 3-6

MONITOR INSTRUCTIONS:

Wait until all the children in the group are seated, and each individual child has a pencil and a copy of the answer sheet ready. When they are settled, begin:

I need some information from each of you which will take about twenty minutes to do.

First of all, look at your answer sheet. Some things are already filled in for you--your school, your teacher and the date are filled in. Look where it says "Student's name" and write your name in the blank; remember to write your first and last name. *(Wait a moment to be sure that this is done: the second monitor should check the group)*

Ready? Now circle whether you are a boy or a girl. *(Pause)* Now write in your age--you're probably either ___ or ___ or ___, right? *(Pause)* Now write in your grade; you are all in grade ___ (or ___), so put in the right one. *(Stop here, and check to be sure that the first part is completed on each child's answer sheet).*

Okay, now I'm going to ask you to listen to some sentences and tell me what you think about them. You can see a list of numbers on your paper, with a yes, no, and maybe after each number. For each of the numbers, I will read you a sentence out loud. Some of you will agree with the sentence--you should circle yes if you agree. Some of you will not agree with the sentence--you should circle no if you do not agree. If you're not sure about how you feel, circle maybe.

There are really no "right" answers to almost all of the sentences; it all depends upon how you feel about what I say. Let me give you an example. Suppose the sentence I read to you is "My favorite color is blue." If this is true for you because your favority color is blue, you agree and you should circle yes. If your favorite color is red or some other color, you disagree and should circle no. If you are not sure if blue is your favorite color, circle maybe.

What if I read, "I don't go to Ala Moana". If this is true for you because you don't go to Ala Moana, then you agree with the sentence and should circle yes. If you do go to Ala Moana, then you disagree with the sentence and you should circle no. If you are not sure, circle maybe.

Remember, the answer to each question depends on you, and your answers will probably be different from other kids' answers. When you are all done, you'll probably have some yeses, some nos, some maybes, or your answers could all be one thing. Any questions? *(Look around and wait for questions)*

Okay, let's get started. Find the number 1 on your answer sheet and I'll read the first sentence. *(Begin. Read each number and sentence one at a time, and wait until everyone has circled an "answer" before you go on to the next item. Check visually every few sentences to be sure that all numbers have a response circled. Be sure to repeat all instructions as indicated on the list of sentences. Always pause after you read a sentence, and read the instruction just before you read the next sentence.)*

Acceptance Scale, 1981
Grades 3-6, page 1

1. We usually have school lunch at nine o'clock in the morning.

2. I have a friend who uses a wheelchair at school.

(Remember, circle yes if you agree with the sentence, no if you disagree, and maybe if you are not sure)

3. My school should try to figure out a way for kids in wheelchairs to go on field trips with us.

4. If I had a retarded brother or sister, I wouldn't tell anybody.

5. I have talked with some mentally retarded students at my school.

6. If I found out that someone I play with is mentally retarded, I would still keep on playing with him.

(You should mark how you feel: yes if you agree, no if you disagree, and maybe if you are not sure)

7. I have talked to some students who use wheelchairs.

8. I don't think it's nice to call a special ed kid "mental."

(Now, go to the top of the next column to answer sentence number 9)

9. I'm not friends with any of the kids who use wheelchairs.

10. It's hard for me to make new friends.

11. I don't like to be close to a kid who looks or acts different.

(Remember: if the sentence is true for you and you agree, mark yes. If it's not something you could say, then you disagree and should mark no. If you are not sure, mark maybe)

12. I think that a kid who is deaf or blind could be in my room.

13. If someone gave me two flower leis and I gave one away, I would have one left.

14. I don't think it's OK to call one of your friends "mental."

15. I don't want a child from the special ed class to sit next to me on the bus on a field trip.

16. I think that the severely handicapped kids should have lunch with my class in the cafeteria.

(Now turn your answer sheet over for the next sentence)

17. If a mentally retarded child wanted to play with me and my friends at the park, that would be OK.

(Remember to mark according to how you feel about the sentence)

18. During recess, I never play with any special ed kids who are retarded.

19. I think I could be good friends with a special ed student.

20. If one of my good friends called a special ed kid "mental," I would tell my friend not to say that.

(Circle yes if you agree with the sentence, no if you disagree, and maybe if you are not sure)

21. I play with kids from different classrooms at recess.

22. I wish I could make friends with a mentally retarded student.

23. I have made friends with a mentally retarded student.

24. I don't say hello to kids who are retarded.

25. You shouldn't call someone "dummy" just because he made a mistake.

(If the sentence is something true for you, circle yes. If you disagree, circle no. Maybe if you are not sure. Now go to the top of the next column to answer sentence 26)

26. I have played on the playground with some mentally retarded students.

27. I have helped some students in wheelchairs.

28. If a kid can't do something or does something wrong, he will probably be called a "dummy" by other kids.

29. Children who are retarded could come into my room at school for activities.

30. I don't want to be friends with a severely handicapped child.

(Circle yes, no or maybe depending upon how you feel about the sentence)

31. Sometimes, I wish I could play with some mentally retarded students like other kids.

32. If someone told me about a new TV show about handicaps, I would watch it if I could.

33. I would like my class to go to camp the same week that a class of handicapped kids was there.

34. If a mentally retarded child wanted to play with me at the park, that would be nice.

(Finished! Thank you for filling this out for us. Please give your answer sheet to the monitor)

UE 3-6

31

ANSWER SHEET

SCHOOL _____ DATE _____

TEACHER _____ STUDENT'S NAME _____

CIRCLE ONE:

BOY GIRL

AGE: _____ GRADE OR CLASS: _____

DIRECTIONS: LISTEN CAREFULLY TO THE MONITOR WHO WILL READ SOME SENTENCES OUT LOUD. AFTER YOU LISTEN TO EACH SENTENCE, MARK YOUR ANSWER LIKE THIS:

IF YOU AGREE WITH THE SENTENCE, CIRCLE YES
IF YOU DON'T AGREE WITH THE SENTENCE, CIRCLE NO
IF YOU ARE NOT SURE, CIRCLE MAYBE

NOW LISTEN TO THE MONITOR:

1. YES NO MAYBE
2. YES NO MAYBE
3. YES NO MAYBE
4. YES NO MAYBE
5. YES NO MAYBE
6. YES NO MAYBE
7. YES NO MAYBE
8. YES NO MAYBE

Now go to the top of the next column to answer sentence 9 →

9. YES NO MAYBE
10. YES NO MAYBE
11. YES NO MAYBE
12. YES NO MAYBE
13. YES NO MAYBE
14. YES NO MAYBE
15. YES NO MAYBE
16. YES NO MAYBE

Now turn the answer sheet over for the next sentence →

17. YES NO MAYBE

18. YES NO MAYBE

19. YES NO MAYBE

20. YES NO MAYBE

21. YES NO MAYBE

22. YES NO MAYBE

23. YES NO MAYBE

24. YES NO MAYBE

25. YES NO MAYBE

Now go to the top of the next column to answer sentence 26 →

26. YES NO MAYBE

27. YES NO MAYBE

28. YES NO MAYBE

29. YES NO MAYBE

30. YES NO MAYBE

31. YES NO MAYBE

32. YES NO MAYBE

33. YES NO MAYBE

34. YES NO MAYBE

Finished! The monitor will collect your answer sheet.

THANK YOU!

ACCEPTANCE SCALE
1981 version, Grades 3-6

Scoring Key

Veridicality Check: answers to these two items must be correct, or the student's protocol should be considered invalid:

1. Correct answer is NO

13. Correct answer is YES

General Friendship/Play Items: these items should not be included in the computation of the Acceptance Total, but reflect a student's general feelings about friendships, which could of course affect his/her willingness to interact with handicapped children as well. High score is positive from a minimum of 0 to a maximum of 4:

10. Yes=0 No=2 Maybe=1

21. Yes=2 No=0 Maybe=1

Acceptance Total: an overall measure of acceptance can be obtained by totalling a student's responses to the 30 items as listed below. High scores are positive from a minimum of 0 to a maximum of 60. Information regarding subscales which represent a further breakdown into attitudinal dimensions can be obtained by writing to the author.

2.	Yes=2	No=0	Maybe=1	19.	Yes=2	No=0	Maybe=1
3.	Yes=2	No=0	Maybe=1	20.	Yes=2	No=0	Maybe=1
4.	Yes=0	No=2	Maybe=1	22.	Yes=2	No=0	Maybe=1
5.	Yes=2	No=0	Maybe=1	23.	Yes=2	No=0	Maybe=1
6.	Yes=2	No=0	Maybe=1	24.	Yes=0	No=2	Maybe=1
7.	Yes=2	No=0	Maybe=1	25.	Yes=2	No=0	Maybe=1
8.	Yes=2	No=0	Maybe=1	26.	Yes=2	No=0	Maybe=1
9.	Yes=0	No=2	Maybe=1	27.	Yes=2	No=0	Maybe=1
11.	Yes=0	No=2	Maybe=1	28.	Yes=0	No=2	Maybe=1
12.	Yes=2	No=0	Maybe=1	29.	Yes=2	No=0	Maybe=1
14.	Yes=2	No=0	Maybe=1	30.	Yes=0	No=2	Maybe=1
15.	Yes=0	No=2	Maybe=1	31.	Yes=2	No=0	Maybe=1
16.	Yes=2	No=0	Maybe=1	32.	Yes=2	No=0	Maybe=1
17.	Yes=2	No=0	Maybe=1	33.	Yes=2	No=0	Maybe=1
18.	Yes=0	No=2	Maybe=1	34.	Yes=2	No=0	Maybe=1

APPENDIX E

Univariate F Tests of SIOS Variables

Ten SIOS Variables Grouped by Treatment Condition

Ten SIOS Variables Grouped by Moderately Handicapped Status

Thirteen SIOS Variables--Comparisons of Nonhandicapped Students in the Two Treatment Conditions

Ten SIOS Variables--Comparisons of Moderately Handicapped Students in Two Treatment Conditions

Univariate F Tests on Ten SIOS Variables Grouped by Treatment Condition--(1,44) Degrees of Freedom

Behavior Category	Hypothesized Mean Square	Error Mean Square	F	Significance of F
Orient NON	.002	.157	.014	.906
Neutral	.002	.174	.013	.910
Positive	.032	.090	.360	.551
Appropriate	.470	.342	1.373	.247
Cooperative NON	.095	.105	.900	.348
Comment NON	.514	.173	2.960	.092
Comment Other	.006	.038	.168	.684
Questions	.035	.015	2.297	.137
Intrusion	.049	.010	4.873	.033
Parallel Play	.375	.170	2.200	.145

Univariate F Tests on Ten SIOS Variables Grouped by
Moderately Handicapped Status--(1,44) Degrees of Freedom

Behavior Category	Hypothesized Mean Square	Error Mean Square	F	Significance of F
Orient Non	1.871	.157	11.934	.001
Neutral	.261	.174	1.502	.227
Positive	.004	.090	.044	.835
Appropriate	11.758	.342	34.392	.000
Cooperative Non	.085	.105	.811	.373
Comment Non	.165	.174	.952	.335
Comment Other	.320	.038	8.448	.006
Questions	.030	.015	1.930	.172
Intrusion	.018	.010	1.752	.193
Parallel Play	4.878	.170	28.657	.000

Univariate F Tests on Thirteen SIOS Variables
Comparisons of Nonhandicapped Students in the
Two Treatment Conditions--(1,30) Degrees of Freedom

Behavior Category	Hypothesized Mean Square	Error Mean Square	F	Significance of F
Orient SPED	.921	.115	7.985	.008
Orient NON	.308	.115	2.682	.112
Neutral	.003	.180	.016	.901
Positive	.066	.098	.674	.418
Appropriate	.019	.344	.056	.815
Cooperative SPED	.655	.088	7.451	.011
Cooperative NON	.001	.103	.006	.938
Comment SPED	3.017	.150	20.068	.000
Comment NON	.002	.149	.011	.919
Comment Other	.001	.048	.020	.889
Questions	.034	.017	1.993	.168
Intrusion	.050	.011	4.422	.044
Parallel Play	1.139	.181	6.300	.018

Univariate F Tests on Ten SIOS Variables
Comparisons of Moderately Handicapped Students in
Two Treatment Conditions--(1,14) Degrees of Freedom

Behavior Category	Hypothesized Mean Square	Error Mean Square	F	Significance of F
Orient NON	.494	.247	2.001	.179
Neutral	.027	.160	.154	.701
Positive	.003	.072	.038	.849
Appropriate	1.912	.337	5.670	.032
Cooperative NON	.324	.109	2.959	.107
Comment NON	1.407	.227	6.187	.026
Comment Other	.009	.016	.543	.474
Questions	.004	.012	.360	.558
Intrusion	.004	.007	.598	.452
Parallel Play	.201	.148	1.362	.263