Cooperative Learning as an Academic Intervention

For Students with Behavioral Disorders

by

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Abstract

Cooperative Learning as an Academic Intervention For Students with Behavioral Disorders

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This single-subject study examined the effect of introducing a form of cooperative learning on the content-specific academic growth and task-related interactions with peers for primary-grade students with behavioral disorders (BD) being educated in regular education classrooms. The study was conducted using a multiple baseline design across three classrooms with a withdrawal phase and varying numbers of participants in each classroom. Baseline conditions consisted of whole-group science instruction followed by individualized groupwork. Students remained in the same academically heterogeneous groups of four throughout the study. The intervention phase consisted of a continuation of the whole-group science instruction with the following changes in the structure of the groupwork: 1) students were given cooperative (as opposed to individualistic) tasks; 2) positive reward interdependence (i.e. an interdependent group contingency) was initiated; and 3) students were allowed to contribute to the attainment of the group reward by improving on their pre-test performance -- providing equal opportunities for success.

Content-specific academic growth was operationalized as gain scores calculated as the difference in items correct on pre-tests versus post-groupwork quizzes over science material covered. Observational data was collected to measure frequency of task-related interactions between the students with BD and their non-disabled peers.

According to Vygotskian and Piagetian theories, increases in task-related interactions among peers lead to increased achievement -- especially for low-achievers. In this study, I attempted to maximize the likelihood that increased interactions would take place by incorporating cooperative group goals, positive reward interdependence, and equal opportunities for success into the cooperative learning intervention. However, with all of these elements in place, the intervention employed did not have a noticeable impact on frequencies of task-related interactions for the students with BD. Also, gains in content-specific academic achievement could not be verified due to the low number of data points in the baseline and/or withdrawal phases for some students and the variability demonstrated in the intervention phase.

Several obstacles to the theoretical relationship between C.L. and task-related interactions were noted and implications for future research were discussed.

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Chapter 1

Introduction

Statement of the Problem

A current trend in education is toward the full inclusion of students with special needs in regular education classrooms. This trend grew out of the regular education initiative (REI) which started with the goal of educating larger numbers of students with mild disabilities in the regular education environment to increase the overall academic achievement in schools (Lewis, Chard, & Scott, 1994). Over time, the objective of a fully inclusive program has grown -- from simply increasing academic achievement to also increasing social competence and fostering positive relationships between special needs children and their non-handicapped peers (Lewis, et al.). Thus, not only are contemporary teachers educating increasingly diverse groups of students, but their responsibilities are expanding to include more and more non-academic objectives.

In a recent report to congress, the Department of Education (1994) estimated that 44% of students with behavioral disorders (BD) were receiving their special education services in resource rooms or regular education classrooms. As it is becoming more common for students with BD to be included in inclusive classrooms (Lewis, Chard & Scott, 1994), this percentage may be on the rise. Students with BD present a special challenge for teachers in inclusive classrooms as they are considered among the most difficult students to teach (Council for Children with Behavioral Disorders, 1989) -- exhibiting deficits in academic achievement (Epstein, Kinder, & Bursuck, 1989) as well as deficiencies in social-behavioral adjustment (Walker & Bullis, 1991).

Unfortunately for educators seeking guidance in constructing inclusive programs for students with BD, researchers reviewing the literature on increasing the academic achievement of students with BD have voiced concern that ``little is known regarding optimal strategies for teaching basic skills and less is known about teaching content area information'' to these students (Ruhl & Berlinghoff, 1992). Additionally, what academic intervention research is available has been conducted primarily with participants from self-contained classes or special schools. My own recent review of the academic intervention literature (Malmgren, 1997) revealed that of 17 studies investigating methods for students with BD -- only 3 were conducted with students in regular education or resource room programs.

Empirical evidence of practices affecting social behavior is certainly more robust (see Strain, Guralnick, & Walker, 1986; Morgan & Jenson, 1988). Yet these empirically validated practices are not often implemented successfully in regular education settings (Walker & Bullis, 1991). This may be due to the complexity of the interventions (Walker & Bullis) or to the fact that programs and strategies that do not directly impact academic skills in some way are viewed as ``add-ons'' and not typically maintained by regular education teachers (Fullan, 1991; Johnson, 1970, 1979).

Lacking a foundation of research on effective academic interventions specifically for students with BD, experts in special education commonly recommend strategies shown efficacious for heterogeneous classrooms in general when discussing the inclusive education of these students (e.g. Falvey, 1995; Falvey, Coots, Bishop, & Grenot-Scheyer, 1989; Fisher, Schumaker, & Deshler, 1996; Waldron, 1996). This research addresses this gap in the literature by examining the impact of an instructional strategy commonly used in heterogeneous, inclusive classrooms on the achievement of students with BD.

Small-group Instruction

Small-group instruction -- as opposed to whole-group instruction -- is an instructional arrangement where students within a class are divided into groups for the purpose of learning (Lou, et al., 1996). For teachers in regular education classrooms, small-group instruction is a practical teaching strategy for many reasons. Small-group instruction increases opportunities for active responding and individualized instruction, as well as sets the stage for increased learning through task-related interaction with peers and increased positive relationships among classmates.

Opportunities for active responding and individualized instruction. Utilizing small-groups enables teachers to increase instructional time and opportunities to respond for all students. Such increases in opportunities to actively respond and practice new academic skills have been linked to higher outcomes for students with disabilities (O'Connor, in press). Students exposed to whole-group instruction and then left to individual seatwork spend much of their time without instructional guidance and frequently exhibit off-task behavior (Cohen, 1994, pp. 20-21).

Small-group instruction, has another benefit in that it increases a teacher's ability to individualize instruction. With students working in groups, teachers are free to give instructions or explanations to the whole class or just to specific groups. This type of arrangement also allows teachers to easily vary assignments or instructions within the larger group. The merit of this aspect of small-group instruction is punctuated by Lou, et al.'s (1996) finding in their meta-analysis of group instruction that effect sizes were higher when teachers individualized instructional materials across groups.

For teachers in inclusive classrooms, small-group instruction not only offers convenience for individualization, but is also a vehicle for providing higher proportions of direct instruction and response opportunities.

Increasing task-related interactions and promoting peer relationships. The theoretical rationale for small-group instruction as a strategy for increasing academic achievement centers upon the interaction among peers around academic tasks. Vygotsky defined the zone of proximal development as ``the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers'' (1978, p.86). According to Vygotsky, working in a heterogeneous group of peers promotes learning for low achievers because the higher achieving peers are modeling behaviors more advanced than the low achievers could achieve on their own, but still within their zone of proximal development. Vygotsky stresses the importance of collaboration among learners in that ``functions are first formed in the collective in the form of relations among children and then become mental functions for the individual'' (1978, p. 47). Even arguing is viewed as positive in that it gives rise to reflection.

In a similar vein, Piaget (1926) held that social-arbitrary knowledge (which includes reading and math) can *only* be learned through interaction with others. According to Piagetian theorists, peer interaction allows children who have yet to master a certain principle (e.g. conservation) to develop that concept by collaborating with more advanced peers on tasks which require knowledge of that concept for success. Discussions give rise to conflicts in which inadequate reasoning is exposed -- allowing higher quality understandings to emerge (Wadsworth, 1984).

While Vygotskian and Piagetian theories of learning stress the benefit to low-achievers in small-group peer-mediated instructional settings, research in cognitive psychology points to benefits for high-achievers in small-group settings as well. When learners engage in cognitive restructuring, or elaboration of material (e.g. explaining a concept to a less-abled peer) that material is better retained and related to other information already in the learner's memory (Wittrock, 1978). The benefits of explaining material to someone else have been well-documented in research on tutoring as well (e.g. Devin-Sheehan, Feldman, & Allen, 1976).

Small-group instruction is also thought to improve social relations among heterogeneous peers. Gordon Allport's (1954) contact theory of intergroup relations holds that when individuals of different backgrounds work together on equal footing to achieve common goals and get to know one another as individuals, prejudices are shed and friendships may evolve. While not all forms of small-group instruction provide a platform for students to work toward a common goal with equal opportunities for success -- those that do certainly meet the requirements for promoting positive relations under Allport's theory. While Allport's contact theory was developed with interracial interaction in mind, recent researchers (e.g. Slavin & Stevens, 1991) have extended the same principles to improving relations between regular education students and their mainstreamed special education classmates. This is an important point because mainstreamed special education students have been found to be less well accepted and more frequently rejected on sociometric measures than their regular education peers (e.g. Clever, Bear, & Juvonen, 1992; Larrivee & Horne, 1991).

Maximizing Positive Outcomes in Small-group Instruction

The effectiveness of small-group instruction can be hindered or increased depending on the specific characteristics of the groupwork. Group composition, nature of the group task, and relative ability of group members can have a significant impact on increases in task-related interactions and increases in academic achievement.

Group composition. The decision to place students in heterogeneous vs. homogenous ability groups depends on the nature of the learning task (Noddings, 1989). With regard to subject area of instruction, a recent meta-analysis of within-class grouping found that overall effect sizes for homogeneous and heterogeneous ability instructional groups in mathematics and science were not significantly different, while in reading, homogenous ability groups were superior (Lou, et al., 1996). This may be because tasks in math and science are typically more hierarchical and thus discussion with and assistance from peers of varying abilities may be more likely to benefit student progress (Lou, et al.).

Lou et al.'s (1996) meta-analysis also determined that the effects of homogenous vs. heterogeneous groups were not stable across student ability. Low-ability students learned significantly more in heterogeneous groups, regardless of subject matter. This is most likely because low-achievers have most to gain from peer interaction around learning tasks. Low-achievers in homogeneous groups lack models of more capable thinkers and want for peers who can stretch their learning by pushing the limits of their zones of proximal development.

Because most students with BD exhibit academic deficiencies (Epstein, et al., 1989) it is likely that academic growth for these students will be maximized by using heterogeneous ability groups during small-group instruction -- especially in math and science. Also, if Allport's (1954) contact theory can be applied to relations between mainstream and special education students, small-groups comprised of students from both of these categories will produce increases in positive interactions between them.

Positive interdependence. Positive interdependence exists when individuals perceive that their accomplishments contribute positively to the accomplishments of others (Lou, et al., 1996). When students in small-groups are recognized for the accomplishments of their group as a whole -- positive interdependence is in place and the learning would be considered cooperative. When students are placed in small groups for instruction but there is no structure in place for positive interdependence, the learning would be considered competitive or individualistic in nature (Johnson & Johnson, 1990).

The benefits to academic achievement of cooperative groups over competitive or individualistic learning have been thoroughly documented (Johnson & Johnson, 1985; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981) as have the benefits of cooperative groups on positive peer interactions (Cooper, Johnson, Johnson, & Wilderson, 1980).

In dispute is the *type* of positive interdependence that facilitates these positive outcomes.

According to Slavin (1995), positive reward interdependence, referred to as interdependent group contingencies in behavioral literature, is the critical element for ensuring successful cooperation among students in small-group learning situations. This view holds that cooperation -- which leads to peer interaction around the academic task -- which leads to increased achievement -- is assured only when group members understand that they will be rewarded if and when they collectively meet some standard. With this understanding, group members will apply reinforcers (e.g. encouragement) and punishers (e.g. social sanctions) to ensure that all group members succeed and thus all group members can receive their reward (Slavin, 1987).

Since 1969, the application of group contingencies to classroom behaviors has been widely studied. While the bulk of this research has addressed observable student compliance behavior (e.g. talking out and out-of-seat behavior), positive effects of group contingencies on academic behaviors and overall achievement have also been demonstrated (e.g. Axelrod & Paluska, 1975; Hamblin, Hathaway, & Wodarski, 1971; Lovitt, Guppy & Blattner, 1969; Van Houten, 1980), including positive effects for students with BD (Salend & Sonnenschein, 1989).

Johnson & Johnson (1990) have contended, however, that reward interdependence is *not* the necessary element in orchestrating a cooperative learning group. These researchers contend that the essential element is goal interdependence. It is theorized that students in groups will interact with each other if they are given a community goal. Since interaction around the academic task is the important feature -- the existence of a group reward is unnecessary. Lou, et al. (1996) ventured that reward structures may be important only for students in classrooms where cooperative learning is not the norm. However, research comparing the achievement of students in cooperative groups with reward vs. goal interdependence generally favors those groups with reward interdependence in place (Lew, Mesch, Johnson, & Johnson, 1986a, 1986b; Mesch, Johnson, & Johnson 1986). Johnson & Johnson hold that the effects of goal and reward interdependence may be additive. This hypothesis is impossible to test however, because reward interdependence cannot be employed without a group goal (i.e. goal interdependence) in place. Therefore, to maximize academic growth, it is prudent to utilize group rewards in conjunction with group goals when establishing cooperative groups.

Equal opportunities for success. Contact theory of inter-group relations (Allport, 1954) emphasizes the importance of equal-status contact in increasing familiarity and attraction between students who initially perceive themselves to be dissimilar. According to this theory placing students in heterogeneous-ability cooperative learning groups will not necessarily lead to an increase in positive interactions unless some structure is built into the activity to ensure an ``even playing field.'' Some specific manifestations of cooperative learning have such structures.

Researchers at Johns Hopkins University have developed cooperative learning techniques, known as Student Team Learning methods, which allow students to contribute to their group's goal by improving on their own past performance. In these methods, group rewards are awarded to groups based on the degree to which members meet or exceed their own earlier levels of achievement. These methods prevent low-achieving students from being viewed as burdensome by their group members and have been shown to promote acceptance of mainstreamed special education students (Madden & Slavin, 1983; Slavin, 1984). It could be hypothesized, then, that since students with BD are typically low-achievers (Epstein, Kinder, & Bursuck, 1989), increases in positive peer interactions resulting from participation in cooperative learning groups would be maximized in methods which provide equal opportunities for success for all students. Increases in peer interactions should then lead to increases in understanding of the academic content around which the interactions take place.

Obstacles to Consider

Cooperative learning groups are thought to increase achievement for low-achievers because they allow children to interact with more capable peers around academic tasks. While disagreements and differences of opinions can be constructive in these types of learning arrangements -- excessive anti-social behavior can impede a group's functioning. Many prominent cooperative learning researchers (e.g. Cohen, 1994; Dishon & O'Leary, 1984; Slavin, 1995) acknowledge that even well-planned group interventions do not always function smoothly enough for learning to take place. It is possible that students with BD -- who are prone to anti-social behavior -- may display actions in cooperative learning settings that prevent them from receiving the same benefits recorded by other populations of students (see Slavin, 1995). Focusing on a manifestation of small-group instruction that best-suits low-achievers who have little in common with the bulk of their peers serves to minimize the possibility that a failure to show academic growth would be due to an ill-conceived intervention. What is yet to be determined is whether students with BD, by virtue of their unique disability, will fail to thrive in an academic strategy founded upon interactions with peers.

Purpose of Study

The purpose of this study is to examine the effects of introducing a specific type of cooperative learning into an inclusive classroom where students with BD are being educated. The specific type of cooperative learning (heterogeneous ability groups with elements of positive reward interdependence and equal opportunities for success in place) will be referred to simply as cooperative learning (C.L.) hereafter. In order to maximize the potential for success, the study will be conducted during science instruction -- one of the subject areas in which the positive benefits of cooperative learning groups has been demonstrated most clearly.

The research questions proposed are as follows:

1) Do students with BD increase their number of peer interactions related to the academic task when C.L. groups are initiated?

2) Do students with BD gain in subject specific academic achievement when C.L. groups are initiated?

Subsidiary questions include:

3) Do students with BD increase their number of non-task-related peer interactions under C.L. conditions?

4) Do students with BD decrease their frequency of negative peer interactions under C.L. conditions?

Chapter 2

Review of the Literature

Giving children the opportunity to interact with peers around academic tasks holds promise for increasing academic competence based upon frameworks composed by two prominent child development theorists: Lev Vygotsky and Jean Piaget. According to Vygotskian theory, children have ``an actual developmental level'' in various domains. Within any domain, children then have an immediate potential for growth. The difference between a child's ``actual developmental level'' and the developmental level he or she is capable of obtaining in the near future is defined as the ``zone of proximal development'' (Vygotsky, 1978). The potential developmental level is that which can be achieved by the child by solving problems under adult supervision or in collaboration with more competent peers. Interaction is critical in that Vygotsky views the construction of knowledge as a social process.

Piagetian theory overlaps with Vygotskian theory in its acknowledgment of interaction as a critical variable in learning. There is a slight difference, however, in that Piagetian scholars see the benefit of peer interaction around academic tasks in the ``cognitive conflict'' that this interaction allows (Tudge, 1992). Interaction between peers who bring different perspectives to a collaborative lesson are theorized to learn from one another because as conflicts arise inadequate or immature logic is exposed and higher quality understanding results for all. Piaget puts more emphasis on children's spontaneous thought processes in resolving conflicts than does Vygotsky (Sutherland, 1993).

To deduce from these two positions that simply grouping children for academic tasks to facilitate interaction will automatically lead to increased learning, however, is naive. There are a large number of contextual factors that may mediate the impact of peer interaction on learning. Such contextual factors range from the age of the participants (Azmitia, 1988), to the number of students involved in the interactions (Alexopoulou & Driver, 1996), to the nature of the learning task itself (Cohen, 1994). The remainder of this chapter reviews evidence on those contextual factors deemed most germane to the use of groupwork as an academic intervention for students with BD.

Group Composition

According to Vygotskian theory, interaction around an academic task with a more competent peer can set the stage for a child to grow within his or her zone of proximal development. According to Piagetian theory, children who have yet to master a skill are more likely to gain this mastery when working on a task with another child who has already mastered part or all of the skill in question. It is easy to hypothesize from these positions, then, that groupwork with heterogeneous ability peers would be more productive for academic development than groupwork with peers of the same ability. Many researchers have addressed just this point and their work generally supports the use of heterogeneous over homogeneous groups as an instructional tool, especially in the areas of science and mathematics.

In a recent meta-analysis of within-class grouping, Lou, et. al. (1996) noted 12 studies that directly compared the effects of homogeneous ability grouping with heterogeneous ability grouping. While homogeneous ability grouping was found to be advantageous in certain comparisons (e.g. reading instruction), analyzing effects by ability showed that low-ability students learned significantly more in heterogeneous ability groupings in other subject areas. This is important to note considering that an estimated 70% of students with BD are performing below grade level (Knitzer, Steinberg, & Fleisch, 1990).

Several other researchers have addressed the issue of varying benefits across ability groups for homogeneous vs. heterogeneous small-group instruction. In 1991, Nastasi and Clements noted benefits to low-, medium-, *and* high-ability students in heterogeneous groupings. They cautioned, however, that the positive effects of heterogeneous grouping were at risk to compromise when the range of abilities within a group was too wide -- although ``too wide'' was not operationally defined.

Swing and Peterson (1982) found in their studies of collaborative seatwork that low-ability students benefited more from their interactions in heterogeneous ability groups compared to homogeneous groups. In a similar vein, Hooper and Hannafin (1988) found in their study of 8th grade math students that low-ability students who had worked in heterogeneous groups did better on a delayed post-test than their counterparts who had worked in homogeneous groups on the same task -- though they reported little effect on the performance of the high-ability math students.

Other researchers, however, have reported findings that do not clearly point to benefits of one type of small-group instruction over the other. Bright, Harvey, and Wheeler (1980) found in their comparison of homogeneous and heterogeneous groupings in seventh grade mathematics classes that there was no significant treatment or treatment x ability interaction effect. Yueh and Alessi (1988) reported no significant effects for type of ability group when controlling for other factors (e.g. reward structure used) in their investigation of groupwork at the junior high school level. Webb (1982) also reported a lack of significant findings between homogeneous and heterogeneous ability groups in her study of junior high level cooperative learning groups.

Because no studies show a detriment to low-ability students who are placed in heterogeneous groups for science instruction, and because many researchers show positive benefits of heterogeneous groupwork on achievement for low-ability as well as other students, it was concluded that use of heterogeneous ability groups in the cooperative learning intervention employed in this study would maximize the potential benefits to the students with BD.

Task Structure

Group goals. Another important factor to consider when designing small-group instruction academic interventions is the goal structure developed for the students. Several researchers have underscored the importance of children working toward a joint or group goal to maximize the benefits of groupwork to cognitive development. Martin (1985) found that children participating as a group in a mathematical balance beam task experienced greater gains in cognitive development when the children laid out a goal for their team and then worked toward that goal.

Other researchers have compared the effect of students working together toward a cooperative goal vs. students working independently with individualistic or competitive goal structures. Kol'tsova (1978), for example, examined 9th grade students working to form generalizable historical concepts. In the experimental classrooms students worked in groups. In the control classrooms students worked individually. Kol'tsova's finding was that those students working collaboratively in groups developed concepts that were richer and more precise and that the groups were able to cope more ``effectively'' with the problem at hand. In a closer examination of the experimental classrooms, Kol'tsova found that there was variance among the groups: those groups in which students actively contributed to the group goal performed better.

Positive interdependence. Of course, ensuring that students work toward a group goal is best facilitated by ensuring that groups are given *group tasks*. A group task is one that requires some type of input from all the group members in order for the group to be successful (Cohen, 1992). When group members perceive that their accomplishments contribute positively to the outcome for the whole group, positive interdependence exists. A task given to a group that could easily be carried out by an individual does not create positive interdependence. This type of task is not likely to facilitate interaction for all group members -- particularly those low-ability students who may be perceived by their groupmates as having little to offer or students who are rejected socially. To circumvent this problem, Cohen and Cohen (1991) suggest utilizing a classroom management system that encourages students to be responsible for each others' success, issuing specific roles during groupwork to help insure that groups function in a prespecified manner, and utilizing ill-structured tasks (i.e. ones that do not have a single correct answer) for the groups to collaborate on.

Researchers agree that positive interdependence in groupwork is a necessary element for maximizing effects on achievement. Johnson and Johnson (1990) contend that students in groups will interact with each other and thereby achievement will be increased for all group members if they are given a community goal. They refer to this type of positive interdependence as ``goal interdependence,'' meaning that the goal cannot be attained unless every member participates.

Slavin (1995) ascribes to this notion of goal interdependence, but maintains that students must be rewarded for attaining group goals to best insure that all members actively participate and thus benefit academically. The reward would be based upon the individual learning of each student in the group -- ``reward interdependence.'' This element is referred to as an interdependent group contingency in behavioral literature where groups are rewarded for their collective behavior. According to Slavin, this is the best way to avoid small-groupwork in which one or more members ``slacks off'' or groupwork in which low-status or low-ability students are discouraged from participating. By making the group goal increased achievement for all members, and by rewarding groups who accomplish their goal (i.e. reward interdependence), all members of a group will be more likely to interact and academic growth will be maximized for all. This notion is supported by various researchers who have reported that cooperative learning has its greatest effects when groups are rewarded for the increased achievement of all of the members of their group (Davidson, 1985; Ellis & Fouts, 1993; Manning & Lucking, 1991; Slavin, 1983).

Yueh and Alessi (1988) examined reward structure in their study of cooperative learning groups in three junior high school algebra classes and reported a nuance not typically investigated. They found that students in groups that were rewarded for both their individual and group accomplishments performed better than students who were rewarded as a group only. Unfortunately, in the description of their study Yueh and Alessi seem to mix the definition of ``individual accountability'' with their description of individual rewards -- clouding interpretation of their results.

Overall, it appears that positive interdependence established by utilizing group rewards in conjunction with group goals maximizes the positive effects of small-group instruction on academic growth for all students. Tudge (1992) contends that the addition of these factors to groupwork adds the element of motivation that is lacking in most work in the Vygotskian and Piagetian traditions. He views this as a step in the direction of acknowledging that contextual factors also influence learning when peers come together around academic tasks. As an example -- it may not matter how much two children's zones of proximal development overlap if they simply refuse to speak to each other. Explicit group goals and group rewards provide the motivation for the valuable interaction to take place. This distinction may be especially relevant for students with BD who are prime candidates for missing the benefits of task-related peer interaction if left in small groups with little structure and who have traditionally responded well to behavioral interventions.

Providing Equal Opportunities for Success

Familiarity and attraction between peers in a group has been shown to impact the quality of the interactions that take place in that group (Cohen, 1982). Utilizing a group goal and group reward is one step toward minimizing the negative impact of groups made up of children who perceive themselves to be dissimilar to each other. Allport's (1954) contact theory of inter-group relations points out, however, that this may not be enough. Quality interactions may not take place unless all children in the group feel that they have an equal opportunity to succeed. If tasks are structured in such a way that certain members of the group can succeed more easily than others, the stage for further divisiveness may have been set. Creating group tasks in which all students feel that they can contribute to the good of the group helps promote acceptance, leads to more positive interactions, and hopefully to increased achievement.

Allport's (1954) theory was developed with improving interracial relations in mind, though it has been expanded to include relations between mainstream students and other minorities such as special education students who are increasingly being placed in regular education settings. Cohen's work investigating benefits of small-groupwork to low-status students underscores the appropriateness of expanding Allport's theory. Cohen (1994) defines status as an ``agreed-upon rank order where it is generally felt to be better to be high than low rank.'' Low or high status can be assigned to students because of perceived academic ability, attractiveness or popularity, gender, race, or ethnicity. Students with BD would generally be considered low-status and thus at risk for experiencing inequality in participation when working in cooperative groups. Several researchers have documented that low-status students interact less and have less influence in groupwork than high status students (Cohen, 1984; Rosenholtz, 1985; Tammivaara, 1982). Because interaction is a predictor of learning gains (Cohen, 1994), designing groupwork so that all students can participate equally is an important consideration.

Specific forms of cooperative learning have been developed to provide group members with equal opportunities for success (see Slavin, 1995). One form of cooperative learning -- Student Team Learning methods, developed at Johns Hopkins University -- has been used successfully to increase interaction and acceptance for special education students included in regular education classrooms. For example, Madden and Slavin (1983) found in their study of academically handicapped students in cooperative learning groups in elementary mathematics classes that the special education students in the cooperative learning groups received less rejection choices on a sociometric measure than their counterparts in control groups. Cooper, Johnson, Johnson, and Wilderson (1980) examined outcomes for students with mild disabilities (including some with emotional disturbance) in cooperative learning groups as compared to an individualistic learning setting and found that the students in the cooperative setting received more friendship choices.

Student Team Learning methods have been shown to positively affect academic gains for special education students included in regular education environments. In one application of Team Assisted Individualization (a Student Team Learning method), Slavin, Madden, and Leavey (1984) found that special education students in the cooperative learning condition demonstrated better academic performance than their counterparts in a control group. Similarly, Stevens, Madden, Slavin, and Farnish (1987) found that 3rd and 4th grade mildly disabled students in another Student Team Learning method treatment -- Cooperative Integrated Reading and Composition (CIRC) -- showed significantly greater achievement gains than disabled students receiving traditional instruction in regular education classes.

Missing from the literature, however, are studies reporting results of cooperative learning interventions for students with BD in regular education classrooms. A few studies report results of cooperative learning interventions carried out in self-contained classrooms for students with BD (e.g. Salend & Sonnenschein, 1989; Slavin, 1977b), but these results cannot be generalized to students with BD in inclusive classrooms. For instance, Slavin (1977b) reported that there were no differences in achievement between the students in the control and treatment classrooms. This is not necessarily surprising, however, given that the amount of heterogeneity possible in groups comprised solely of students from self-contained classrooms for students with BD is likely minimal. Vygotsky has suggested that children with special needs ought to be educated in mainstream classrooms because if educated only with children with the same handicapping condition their ``entire development proceeds in a completely new direction'' (1993). The benefits of peer interaction around academic tasks is lost, or at least altered, when the peers comprise a sub-set of exceptional students.

Conclusion

From the available research on small-group instruction several conclusions can be drawn: To maximize the chances of success for students with BD in small-group instruction, the groupwork should be carried out in heterogeneous ability groups (particularly in the areas of mathematics and science), with group goals and reward interdependence in a structure that allows all group members to participate successfully. While other contextual factors may impact the efficacy of this type of intervention for students with BD, these factors are worthy of investigation.

Chapter 3

Procedures

This study was conducted using a multiple baseline design across sites with a withdrawal phase and varying numbers of participants in each site. Data was collected on content-specific academic growth and frequency of task-related interactions for the target students. Following a baseline phase, a cooperative learning technique was implemented. During this phase students were given a cooperative task. A group reward was utilized, in addition to a group goal, and students were allowed to contribute to the group goal by improving on their pre-test performance -- providing equal opportunities for success. The intervention phase was followed by a withdrawal of the cooperative learning structures. Multiple probes were taken during each phase. All phases were conducted in the students' regular classrooms and the regular classroom teachers conducted the instruction in all phases. Following are details of the procedures.

Participants

The participants were primary-grade students receiving special education services under the category of Seriously Behaviorally Disordered (BD). To be included in this study, participants were required to receive a majority of their primary instruction in the regular education environment.

The participants in Classroom #1 consisted of 1 African-American boy, 1 boy from the Pacific Islands, and 2 African American girls. Classroom #2 contained one target student: an African-American male. Classroom #3 contained two target students -- both African-American males.

All of the participants in this study were identified as Level 4 special education students by the school district. Level 4 students are those whose behavior is considered the most severe of those students with BD being educated in the regular public school buildings. If a student fails to be maintained in a Level 4 setting, he or she is typically sent to a self-contained school or receives homebound instruction.

Classrooms

The classrooms, all housed within the same public elementary school, each contained 18 students in grades 2 and 3. The three classrooms were considered ``inclusive'' programs, though only the teacher in Classroom #1 was certified to teach special education. The teacher in Classroom #1 was responsible for updating the IEPs (Individualized Education Programs) for all of the special education students in all three classrooms, but conducted the daily instruction only for those students placed in her classroom.

All three classrooms were filled predominantly with students of minority status. In Classroom #1, 16 of the 18 total students (89%) were of African-American descent. Of the remaining two students, one was Latino (5.5%) and the other Pacific Islander (5.5%). Classroom #2 contained 16 African-American students (89%), 1 Asian-American student (5.5%), and 1 Caucasian student (5.5%). Classroom #3 contained 14 African-American students (78%), 1 Asian-American student (5.5%), 1 Pacific Islander student (5.5%), and 2 Caucasian students (11%).

Experimental Design

Students with BD comprise a heterogeneous population of students. Group studies which average results of treatments across participants can obscure individual results (Edgar & Billingsley, 1974) -- a particular concern in the field of special education where progress of individuals is paramount. In addition, students with BD are a low-incidence population (i.e. .08 % of the school-age population; U.S. Department of Education, 1994). These factors together make studying large groups of students with BD in inclusive classrooms potentially misleading. For these reasons, this study employed a single-case research design, replicated across two classrooms containing one or more target students. Staggering the length of baselines across sites augmented the internal validity of the study by reducing the possibility that extraneous factors could explain changes in behavior noted in three distinct instigations of cooperative learning strategies (Kazdin, 1982). The behavior of all the participants was measured simultaneously prior to the introduction of the intervention in the first classroom. The intervention was implemented in the second and third classrooms after short intervals.

The final phase consisted of a withdrawal of the cooperative learning intervention and a return to baseline conditions. The withdrawal phase was staggered across sites in a manner similar to the intervention phase. See Table 1 for a pictorial representation of the phases.

The initial baseline phase lasted 1 to 2 weeks with 3 to 4 data points collected in each classroom. The intervention phase lasted approximately 5 weeks. A minimum of nine data points were collected for each target student. The withdrawal phase lasted an additional week with at least 3 data points collected for each target student.

Table 1

<u>Length of Phases Across Sites</u>

Site	Experimental days
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
Classroom #2	B -- CL -- WD ----------
Classroom #3	B -------- CL --- WD ---------------
Classroom #1	B ------------- CL -- WD -----

<u>Note.</u> Experimental days were those days on which science instruction could possibly have occurred and were not necessarily consecutive. B = baseline conditions; CL = cooperative learning intervention; WD = withdrawal phase, return to baseline conditions.

Curriculum

The science curriculum used for the duration of this study in all three participating classrooms was Insights: An elementary hands-on inquiry science curriculum. Liquids module. This curriculum was developed by Education Development Center with funding from the National Science Foundation. The curriculum was designed to easily facilitate cooperative learning groups and was thus particularly suited for this study.

Baseline

Before baseline instruction began all of the students in the participating classrooms took a pre-test covering the science material to be covered during this phase. The pre-test took approximately 10-15 minutes to complete and was used by the teacher and myself to later assess student academic growth in the science curriculum.

During baseline, the regular education teacher presented new science material to the whole class (approximately 20 min.). Sessions were conducted three to four times per week. Lesson presentations included introductory information describing what the students were going to learn and its importance. Any prerequisite skills or information germane to the lesson were reviewed. After the teacher had presented/explained the current lesson, worksheets were handed out to each student and the directions for the worksheet were discussed.

Students were assigned to academically heterogeneous groups comprised of three to five students, depending upon the number of students in the class. No more than one target student was placed in any group. These groups remained intact for the duration of study.

Students were given approximately 30 minutes to complete their worksheets. The teacher explained that the worksheets were to assist students in mastering the material for the impending quiz and should therefore be used as study guides. Students were informed that they could interact and assist each other during the time allotted for groupwork. During this groupwork period the teacher circulated around the room checking the groups' progress and working with students who required assistance.

At the end of 2 to 3 lessons, (length of time required to cover each new concept), students were given a short (10 minute) quiz over the material covered. Items on the quiz were similar to those included on the worksheets completed during class. Individual students who showed improvement from their pre-test scores on the same material were rewarded with ``Good work'' certificates which could be taken home.

Intervention Phase

Before the intervention was initiated, all of the students took another pre-test. This pre-test covered the science material to be taught in the next phase. Information from the pre-tests was used by the teacher and myself to assess content-specific academic growth during the intervention phase and used to compute the ``base scores'' utilized in the cooperative learning groups.

Groupwork. On the first day of the intervention phase, the cooperative learning group strategies were explained to the students by their teachers. The following changes were implemented in this phase: 1) groups would work together on a cooperative task (as compared to an individualistic task structure as in baseline groupwork); 2) group members would have specific jobs to carry out during groupwork; 3) groups would be given a reward based upon the level of improvement exhibited by all members (i.e. addition of an interdependent group contingency); and 4) ``improvement'' would be defined relative to each students pre-test score on the material covered (i.e. students will have equal opportunity to contribute to the success of their group). According to Vygotskian and Piagetian theories, giving the students a cooperative task should have increased the amount of task-related interaction between group members. The group reward, which consisted of publicly awarding ``Boat bucks'' to groups was designed to facilitate these interactions by giving students a reason to promote behaviors that maximize learning and discourage those that are counterproductive (Slavin, 1987). Finally, allowing students equal opportunities for success helped to create the most supportive environment for interactions specifically between peers who typically view themselves as having little in common (Allport, 1954).

Boat bucks were paper notes to be redeemed at the end of the science unit and could be used to ``purchase'' supplies to be used by the group to make a model boat. Groups from all three classrooms were then to race their boats some time during the last week of the school year.

The 20 minute whole group instruction sessions continued unchanged in the intervention phase. Most concepts took 2 to 3 days to cover. In instances where the day's lesson was a direct continuation of the previous lesson, the whole group instruction took less than 20 minutes.

Instructions to the groups did change from the baseline phase. Groupwork in the intervention phase was be modeled after one of the oldest and most extensively researched, yet simplest, forms of cooperative learning: Student Teams - Achievement Divisions, developed at Johns

Hopkins University (Slavin, 1995). In this phase each group received one worksheet instead of each group member completing a worksheet on his or her own. The teacher directed students to work as a whole group to study the worksheet questions and problems. In most cases an experiment was carried out by the group to facilitate understanding of the concept being covered. Groupmates had the responsibility of insuring that everyone participated actively in the experiment and explaining answers to members of the group who did not initially understand or agree with the group's conclusions. Students were instructed to study the worksheet and encouraged to quiz each other on the material. Emphasis was placed on the idea that no group should finish studying until they were sure that all group members had mastered the material. The teacher also explained that after the quiz, groups in which all team members showed improvement would be awarded Boat bucks.

On the first day of the intervention, students were given an extra 5 minutes to come up with group names. Teams earning Boat bucks were publicly recognized and a running count of Boat bucks received was posted in each classroom.

After the first few days of intervention the teachers began to reward Boat bucks to groups on a daily basis for meeting certain standards of classroom behavior, e.g. all group members participated, group members resolved conflicts respectfully, groups remained on-task. The teachers continued to award Boat bucks for increased academic performance of group members on the science quizzes as well.

Team recognition. Directly after each quiz, I graded individual quizzes and compared each students' answers to his or her answers on the same questions from the pre-test. Improvement points were the number of items correct on the quiz above and beyond the number of items answered correctly on the pre-test. The number of items correct and the number of improvement points awarded were recorded on each quiz. Quizzes were passed back to the students at the beginning of the following science session. Teams receiving Boat bucks were announced at the time the quizzes were returned. On the first day of the intervention, students were reminded by their teachers that groups in which all members made improvement from their pre-test of the same material would receive Boat bucks. It was pointed out that all groups were eligible to receive Boat bucks. The teacher also reviewed the rationale for computing improvement points, covering the following points: 1) the improvement point system gave everyone a chance to be successful if they did their best academically; 2) quiz scores and improvement points of everyone in the group were important; and 3) improvement points allowed students to compete only with themselves -- regardless of how the rest of the class scored.

Withdrawal

After approximately five weeks (12 - 16 sessions) of cooperative learning group-work, science instruction returned to the baseline conditions. The students took another pre-test of the material to be covered in this phase, although the content covered in this phase was part of the same curricular unit as that used in the intervention phase. On the first day of instruction in this phase, students were informed that although they were to continue to working in the same small groups, the groups would not be assessed on the improvement of all members. Presentation of new material by the teacher continued as it had in the previous phases. When students broke into small groups to study worksheets each student was be given his or her own worksheet and materials to manipulate and experiment with. Students were reminded that they were still welcome (but not required) to confer with each other as they completed their worksheets and prepared for the quiz. The quiz was administered after 2 to 3 days of groupwork as in the previous phases. In this phase students were rewarded with individual Boat bucks which they could donate to their group.

Data Collection Procedures

Data on content-specific academic growth. Data on content-specific academic growth was collected in the form of gain scores (i.e. improvement points) for each target student. Pre-tests in each phase included items to be covered in each quiz administered during that phase. I reviewed each students' pre-test and computed a ``base score'' for each set of lessons. Gain scores represented the number of items correct on each quiz above and beyond the students' pre-test score on the same material (i.e. the subset of pre-test questions corresponding to the particular quiz in question). Gain scores were computed by comparing the number of items correct on the 10 item quiz to the corresponding section of the pretest, as opposed to the number of new items correct. Reliability was determined by having a second adult compute gain scores after one lesson for the target students in each classroom.

If a student was not in the classroom at the time of a pre- or post-test, the test was given to him or her individually at the next available time. This did not apply for post-tests of lessons for which a student missed all of the sessions of instruction.

Data on task-related interaction. Observational data was collected to measure the frequency of task-related interactions between the target students and their non-disabled groupmates. Observers collected interaction data for each target student for at least a portion of the groupwork time on each day of science instruction during the course of the study. Frequency of task-related interaction was recorded for each participant each day by dividing the frequency of interactions by the number of minutes observed. This process yielded a measure of task-related interaction that was comparable for different durations of observations (Kazdin, 1982, p. 27).

To record frequency of task-related interaction, I used a target child observation instrument developed by Cohen and Lotan (1995) at Stanford University. The observation instrument is divided into 30-second intervals. An instance of verbal interaction in any of four pre-defined categories was scored by recording a single letter in the appropriate 30 second block. The four categories of interaction were: Task-related, Requests assistance, Offers/gives assistance, and Non-task related. If a participant's talk changed categories, or if the student was interrupted and began talking again in a 30-second period, more than one letter was recorded in that period. The letters recorded corresponded to the target student's partner in that particular interaction. If the interaction was directed toward one student, the interaction was coded as an S. If the interaction was directed to a group of two or more students, the interaction was coded as a G. If the interaction was directed toward a teacher or a classroom aide, the interaction was coded as a T or and A respectively. A copy of the target child observation instrument and the guidelines and scoring manual for the instrument's use are included in the Appendix.

Reliability checks of the observational data collected were taken once each during the baseline and withdrawal phases and at three times during the intervention phase in each classroom. During these checks, a second observer collected observational data using the target child observation instrument at the same time as the primary observer. Interobserver agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100. This process yielded a point-by-point agreement ratio.

Observer Training

Two observers were used in this study, in addition to the principal investigator. I met with each observer for approximately one hour prior to conducting observations in the classrooms to review the Child Observation Instrument and the Guidelines and Scoring Manual for its use. I then conducted one day of observations in one of the experimental classrooms with each observer to insure that each observer understood how to score target student interactions and behavior and to discuss any discrepancies we had during these training observations.

In response to these training observations, two clarifications were made in the observation protocol. First, noises such as humming or clicking the tongue was not to be considered an interaction unless it was directed toward someone for a seemingly communicative purpose. Second, verbalizations by the target student which did not evoke a reaction from anyone were not to be scored as an interaction, since the definition of an interaction is a behavior or vocalization by one person that acts as a trigger for another's response (Crick & Dodge, 1994).

Training was complete when the two observers (myself and one trainee) agreed on 100% of scores for three consecutive 3 minute observations.

Procedural Reliability

The process of checking to see if experimental procedures are implemented as planned is known as procedural reliability. In the case of this study, procedural reliability was checked by observing whether or not the following items were true: 1) Are students working in the physical location of their assigned groups? 2) Does the day's assignment entail working toward a group goal? 3) Are students being rewarded for their behavior as a group?

In order to meet the conditions of the initial baseline and withdrawal phases, the answer to #1 had to be ``yes,'' while the answers to questions #2 and #3 had to be ``no.'' In order to meet the criteria for the Cooperative Learning condition, the answers to all three questions had to be ``yes.'' If the criteria for the particular condition was not satisfied, observational data was not recorded in that classroom on that day.

Data Evaluation

The experimental criterion refers to ``a comparison of performance during the intervention with what it would be if the intervention had not been implemented'' (Kazdin, 1982, p. 231). In a single-subject study this criterion is usually met by examining the effects of the intervention over time to see if the patterns in the data indicate clear effects of the intervention.

In the current study, I visually inspected the charted data (i.e. gain scores and frequencies of task-related interactions) to see if the means and trends in students' baselines were altered when the intervention was initiated in each of the experimental sites and again when the withdrawal was initiated. The results of these analyses are reported in the following chapter.

Chapter 4

Results

Procedural Reliability

Procedural reliability data were collected on each day of science instruction in all three classrooms for the duration of the study. These data were collected by the observer present in the classroom and consisted of answers to three questions: 1) Are students working in the physical location of their assigned groups? 2) Does the day's assignment entail working toward a group goal? 3) Are students being rewarded for their behavior as a group?

In order for the classroom to be deemed in compliance with the procedures outlined for the baseline and withdrawal phases, question #1 should have been answered ``yes,'' while questions #2 and #3 should have been answered ``no.'' On no occasion during the study were the conditions for the baseline and withdrawal phases not met.

During the intervention phase, the answer to all three questions had to be ``yes'' in order for the classroom to be in agreement with the conditions laid out in this study for the cooperative learning (C.L.) phase. In Classroom #1 these conditions were met on every intervention day. Procedural reliability data were not collected on those days on which no target students were present in the classroom in question. On one occasion in Classroom #3, both target students were not present during science instruction and so reliability data were not collected. The lone target student in Classroom #2 was not present in the classroom on four occasions during the study. These absences were due either to absence from school or to participation in a related service pull-out program. On two other occasions the target student in classroom #2 was not working in the physical proximity of his group -- violating the standard set up to check procedural reliability -- and so no observational data were collected on those days. I should note that on the two days Classroom #2 was considered out of compliance with regard to question #1, the majority of students in the classroom were working in the physical proximity of their groups. The target student, however, was seated in time out on one of these occasions, and crawling around the floor of the classroom on the other occasion. On two other intervention days, the answer to question #2, regarding working toward a group goal, was negative and so again observational data were not collected because the procedures for the C.L. condition were not being met. On both of these days, students were sitting in the physical proximity of their groupmates and even being rewarded for their behavior as groups -- but the mode of instruction was whole group. These science lessons took place near the beginning of the intervention phase when the teacher felt that the behavior of the class in general was becoming too unmanageable during groupwork. See Table 2 for a summary of the procedural reliability data.

Note that while only 67% of the science sessions conducted in Classroom #2 during the C.L. phase (while S4 was present) met the criteria laid out for the C.L. condition in this study -- observational data were collected *only* on those days on which the C.L. criteria were being met. The procedural reliability data reflect conditions for every science session and are therefore not estimates.

Table 2

Summary of Procedural Reliability Data

Phase	Possible days	Days after absences	% days procedurally reliable
Classroom #1			
Baseline	6	6	100
C.L.	18	18	100
WD	4	4	100
Classroom #2			
Baseline	3	3	100
C.L.	16	12	67
WD	5	5	100
Classroom #3			
Baseline	5	5	100
C.L.	17	16	100
WD	8	8	100

Note. Possible days = number of school days during the course of the study, excluding days upon which science instruction could not occur because of field trips or day-long schoolwide events; Days after absences = number of days at least one target student in the classroom was present for science instruction.

Interobserver Agreement

Interobserver agreement data were collected on five experimental days across the three phases. Interobserver agreement data were collected for 20 separate observations, or 15.3% of the total 131 observations included in this study. Point by point agreement ratios were calculated by dividing the number of agreements by the number of agreements plus disagreements for each phase. Table 3 presents the interobserver agreement data for each of the 5 assessment days. The mean percentage agreement for the C.L. phase was 94.2. The mean percentage agreement for all phases was 93.9. The majority of disagreements noted were due to auditory difficulties (e.g. one observer could not understand a student exchange) rather than actual disagreements over the category placement of interactions.

Table 3

Interobserver Agreement Rates for Experimental Sessions

Phase	Date	Percentage agreement
Baseline	4/23/97	93.5
C.L.	5/8/97	94.7
	5/15/97	92.6
	5/22/97	95.3
Withdrawal	6/6/97	93.3

Note. C.L. = cooperative learning intervention phase.

Participants

Complete data were collected for six of the original seven participants selected for this study. One of the African American female target students in Classroom #1 was on a half day attendance schedule for the first two weeks of the study causing her to miss each day of science instruction in the initial baseline period. Therefore, this student was dropped from the study. Table 4 contains a summary of the demographic information for the 6 students for whom complete data were collected.

Table 4

Participant Demographic Information

Participant	Gender	Ethnicity	Grade level
Classroom #1			
S1	M	Afr-Am	2
S2	F	Afr-Am	3
S3	M	Pac.Is.	3
Classroom #2			
S4	M	Afr-Am	2
Classroom #3			
S5	M	Afr-Am	2
S6	M	Afr-Am	2

Note. M = male; F = female; Afr-Am = African American; Pac. Is. = Pacific Islander.

Task-related Interactions

Observational data reflecting the frequency of task-related interactions between target students and their peers were collected during each science session which met the criteria for procedural reliability. The target child observation instrument used in this study recognized three separate categories of task-related interactions. These three categories (task-related, requests assistance, and offers assistance) were collapsed into one category for the purpose of data analysis. This was done because the frequencies of interactions in the requests assistance and offers assistance categories were minimal and did not allow for meaningful analysis on their own.

The recipient of the target student's talk was also included as data on the observational instrument. For the purpose of analysis, talk directed toward one student (S) and talk directed toward a group of two or more students (G) was collapsed into one frequency. This was done after discussions with the other trained observers noting that it was often difficult to ascertain whether student comments were directed toward a group or toward a single student.

Analysis of the task-related interaction frequencies addressed the question: Do students with BD increase the number of peer interactions related to the academic task when C.L. groups are initiated? Visual analysis of the means and trends in the three phases of the study for each student was used to answer this question. The split-middle technique (White, 1972) was used to determine trend (slope) lines. Figures 1 - 6 depict the frequencies of task-related interactions across phases for each student in the study.

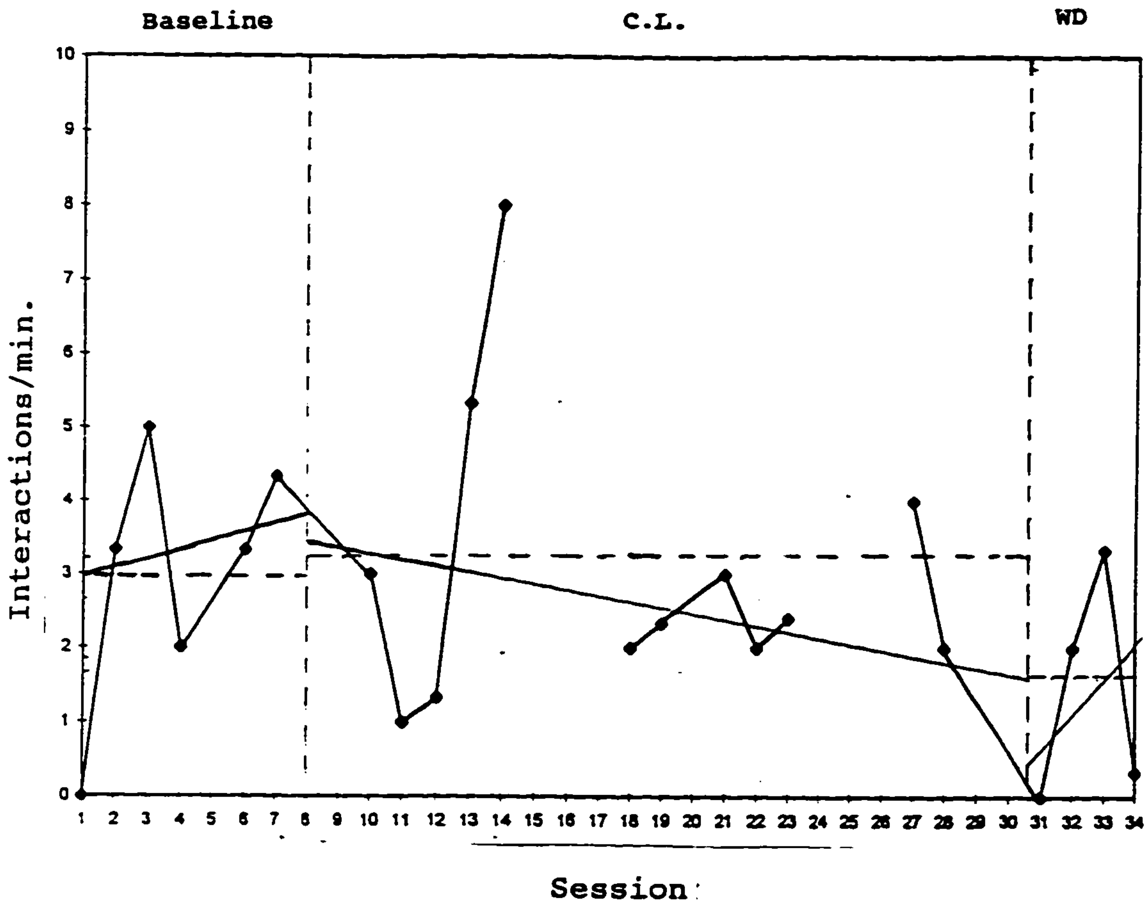


Figure 1. S1's frequency of task-related interactions with non-disabled peers during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases.

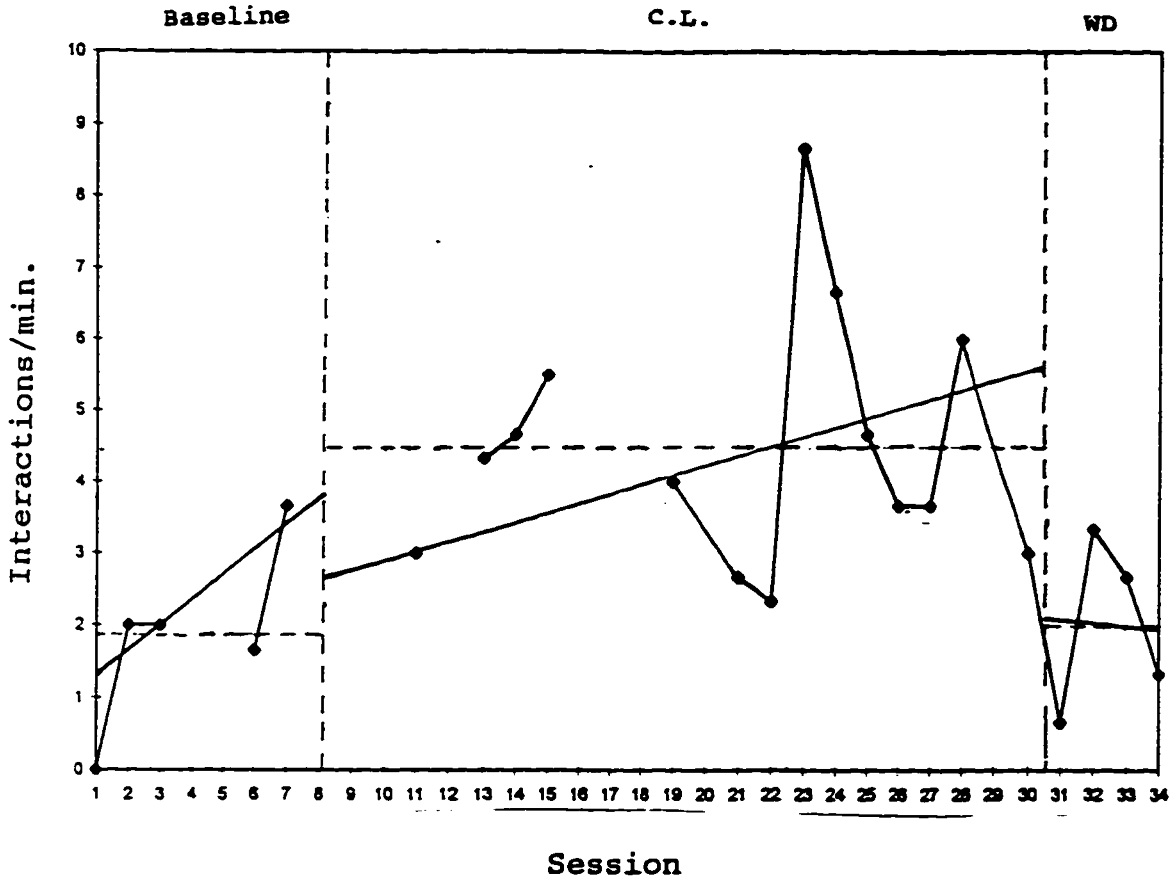


Figure 2. S2's frequency of task-related interactions with non-disabled peers during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases.

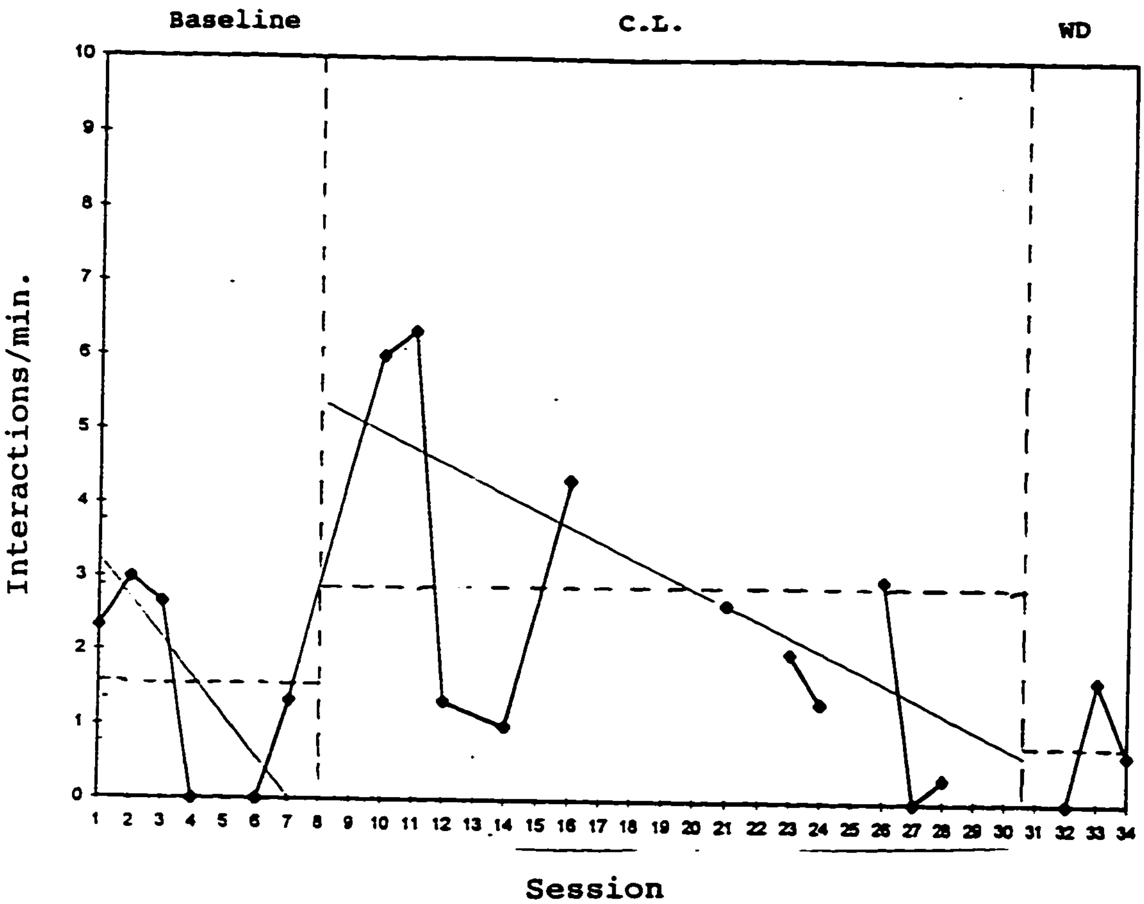


Figure 3. S3's frequency of task-related interactions with non-disabled peers during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases.

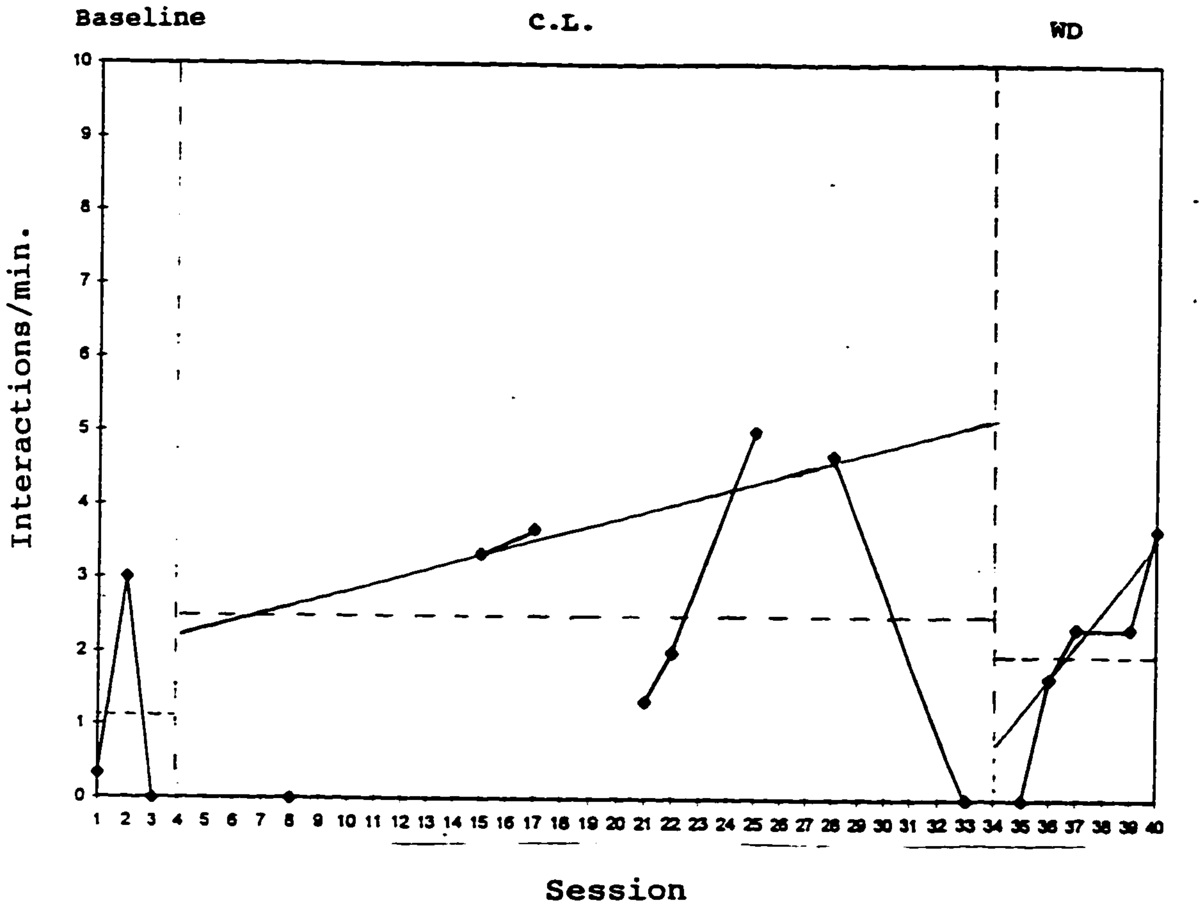
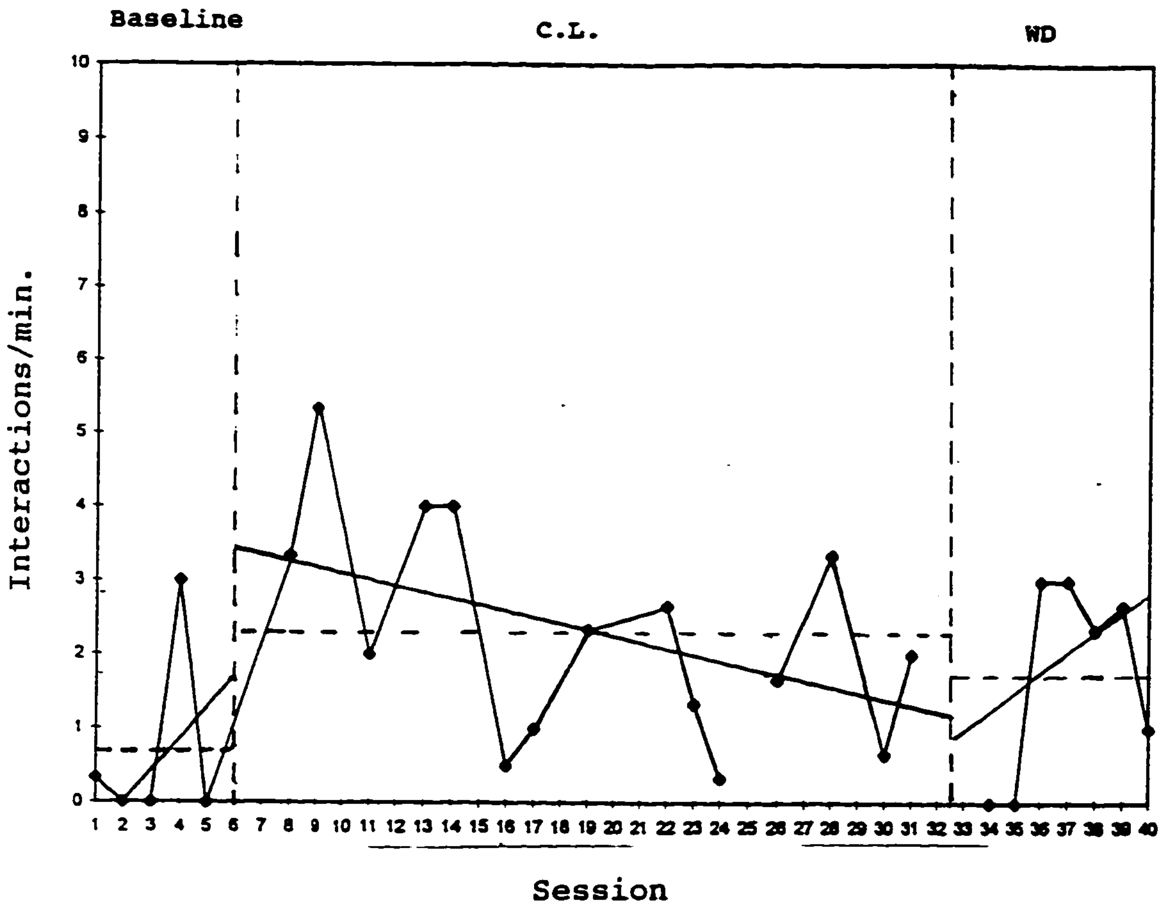


Figure 4. S4's frequency of task-related interactions with non-disabled peers during science instruction in Classroom #2. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases.



<u>Figure 5.</u> S5's frequency of task-related interactions with non-disabled peers during science instruction in Classroom #3. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases.

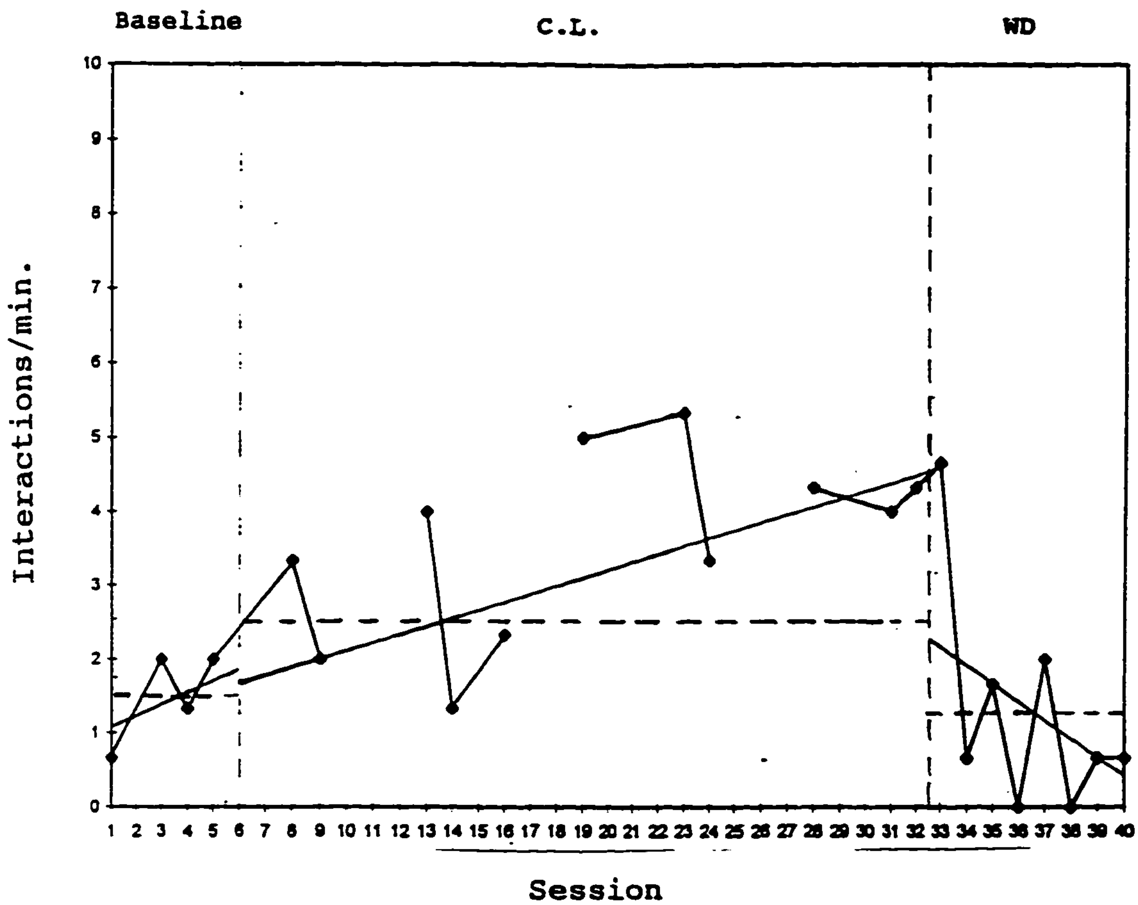


Figure 6. S6's frequency of task-related interactions with non-disabled peers during science instruction in Classroom #3. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases.

Figure 1 shows that while there was a slight increase in the mean number of task-related interactions per minute for S1, the overall trend during the intervention phase was a deceleration. Figure 2 shows a greater increase in the mean number of task-related interactions per minute and S2's interactions during the intervention phase followed a positive trend. While the trend in the initial baseline phase appears to be accelerating at an even faster rate for this student, task-related interactions during the withdrawal phase are flat. Student S3 also had a greater mean number of task-related interactions during the C.L. phase, but exhibited a decelerating trend in both the baseline and C.L. phases. No trend line was established for the withdrawal phase because of the small number of data points for that condition.

Likewise, no trend line could be established in the initial baseline phase for S4. As can be seen in Figure 4, S4's mean level of task-related interactions during C.L. increased and the trend in this phase was an acceleration. S4's level of task-related interactions during the withdrawal phase dropped down initially, but showed an increasing trend when the study concluded.

Figures 5 and 6 represent outcomes for the two target students in Classroom #3. As in the previous graphs, the mean level of task-related interactions was highest during the intervention phase for both S5 and S6. The data in

Figure 5, however, show an overall decelerating trend in the intervention phase and accelerating trends in the baseline and withdrawal phases. S6 shows an accelerating trend in the intervention phase which is almost a continuation of the accelerating trend experienced by this student during baseline. During the withdrawal phase, S6 experienced a sharp deceleration in the number of task-related interactions he was involved in.

Examination of the data in Figures 1 through 6 reveals that higher mean levels of task-related interactions were associated with the addition of C.L. conditions to groupwork. However, inconsistent effects of the intervention and the absence of a clear differentiation of trend lines in favor of the C.L. condition prevent conclusions being drawn in favor of the efficacy of this intervention for students with BD in terms of increasing task-related interactions.

The data for S2 and S6 do, however, provide some evidence of positive effects for the C.L. intervention. Both S2 and S6 show increasing performance during the intervention and decelerating or flat performance during the withdrawal phase. The difficulty with both of these students' behavior is that both also showed accelerating trends during the initial baseline phases making it difficult to ascribe their high levels of interaction during the intervention solely to the initiation of the C.L. condition.

Content Specific Academic Growth

To address the question of whether students with BD experience gains in subject specific academic achievement when C.L. groups are initiated, pre- to post-test gain scores were calculated for each lesson covered during science instruction over the course of the study. All of the science lessons in all three phases in all three classrooms were part of a curriculum on liquids developed by the Education Development Center with funding from the National Science Foundation. Most lessons in the unit took 2 to 3 days of science instruction and groupwork to complete. Gain scores were calculated by comparing post-test scores to pre-test scores at the end of each lesson. The number of gain scores recorded for each student varied by classroom, as the teachers in each classroom did not cover the same amount of material in each of the phases.

Several students had frequent absences and therefore missed one or two days of various lessons. S1 missed 6 of the total 18 science sessions in the intervention phase, including both sessions of 2 two day lessons. S2 missed one day of baseline instruction and 4 days of C.L. instruction. S3 missed 7 days of C.L. instruction and 1 day of science instruction during the withdrawal phase. In

Classroom #2 science instruction occurred on 16 days during the intervention phase. Two of these sessions did not meet the criteria for C.L. Of the remaining 14 sessions, S4 missed four because of absences from the classroom and two because he was not participating in the groupwork due to behavioral difficulties. The teacher in Classroom #3 carried out science instruction on 17 days. S5 missed only 2 of these sessions due to absences. S6 missed 1 day of baseline science instruction and 6 days of C.L. instruction. Tables 5 - 10 show gain scores for each student along with information on the number of days of science instruction the student actually received during the lesson to which each gain score corresponds.

Table 5

<u>S1's Gain Scores for Science Lessons by Phase</u>

Phase	Days of participation/ # of sessions in lesson	Pre/Post score	Gain score
Baseline	3/3	1/6	+5
	3/3	1/8	+7
C.L.	3/3	1/5	+4
	2/2	0/9	+9
	0/2		--
	3/3	0/8	+8
	2/3	0/10	+10
	0/2		--
	2/3	0/9	+9
Withdrawal	4/4	1/4	+3

<u>Note.</u> C.L. = cooperative learning intervention.

Table 6

S2's Gain Scores for Science Lessons by Phase

Phase	Days of participation/ # of sessions in lesson	Pre/Post score	Gain score
Baseline	3/3	8/8	0
	2/3	8/6	-2
C.L.	1/3	1/7	+6
	2/2	0/4	+4
	1/2	3/8	+5
	2/3	0/7	+7
	3/3	5/10	+5
	2/2	2/9	+7
	3/3	0/9	+9
Withdrawal	4/4	1/4	+3

Note. C.L. = cooperative learning intervention.

Table 7

S3's Gain Scores for Science Lessons by Phase

Phase	Days of participation/ # of sessions in lesson	Pre/Post score	Gain score
Baseline	3/3	4/5	+1
	3/3	4/4	0
C.L.	3/3	5/9	+4
	1/2	0/7	+7
	1/2	4/8	+4
	1/3	0/8	+8
	2/3	0/10	+10
	1/2	7/8	+1
	2/3	1/5	+4
Withdrawal	4/4	0/2	+2

Note. C.L. = cooperative learning intervention.

Table 8

S4's Gain Scores for Science Lessons by Phase

Phase	Days of participation/ # of sessions in lesson	Pre/Post score	Gain score
Baseline	3/3	7/1	-6
C.L.	1/3	6/8	+2
	2/2	0/4	+4
	1/2	1/1	0
	2/2	6/6	0
	2/3	1/5	+4
Withdrawal	3/3	0/0	0
	2/2	0/0	0

Note. C.L. = cooperative learning intervention.

Table 9

S5's Gain Scores for Science Lessons by Phase

Phase	Days of participation/ # of sessions in lesson	Pre/Post score	Gain score
Baseline	2/2	1/4	+3
	3/3	0/3	+3
C.L.	3/3	1/5	+4
	2/2	0/0	0
	1/1	0/2	+2
	2/2	0/3	+3
	3/3	2/3	+1
	2/3	0/8	+8
	2/3	0/3	+3
Withdrawal	2/3	6/7	+1
	2/2	5/7	+2
	3/3	0/4	+4

Note. C.L. = cooperative learning intervention.

Table 10

S6's Gain Scores for Science Lessons by Phase

Phase	Days of participation/ # of sessions in lesson	Pre/Post score	Gain score
Baseline	1/2	6/9	+3
	3/3	4/0	-4
C.L.	2/3	6/7	+1
	2/2	0/6	+6
	1/1	5/6	+1
	1/2	2/3	+1
	2/3	5/10	+5
	1/3	7/10	+3
	2/3	2/0	-2
Withdrawal	3/3	4/0	-4
	2/2	5/7	+2
	3/3	2/7	+5

Note. C.L. = cooperative learning intervention.

All three students in Classroom #1 (S1, S2, and S3) experienced a ceiling effect on one of the post-tests (i.e. scoring 100%). Both S1 and S3 happened to have scored a 0 on the pre-test for that lesson and so received the maximum gain score possible. S2 scored a 5 on the pre-test and therefore received a gain score of 5, perhaps underestimating the amount of content-specific gains she achieved during that three day period.

S6 scored 100% on two separate post-tests. Again, his posted gain scores of +5 and +3 for those days may be misleadingly low estimates of the amount of knowledge gain he actually experienced.

Mean gain scores for each phase for each student are reflected in Figures 7 - 12. Note that students S1, S2, and S3 received only one gain score during the withdrawal phase. The gain score reflected in those cases is simply the single score for that phase -- not actually a ``mean.'' The same is true for the initial baseline gain score for S4, whose classroom participated in only one 3 day science lesson during that phase.

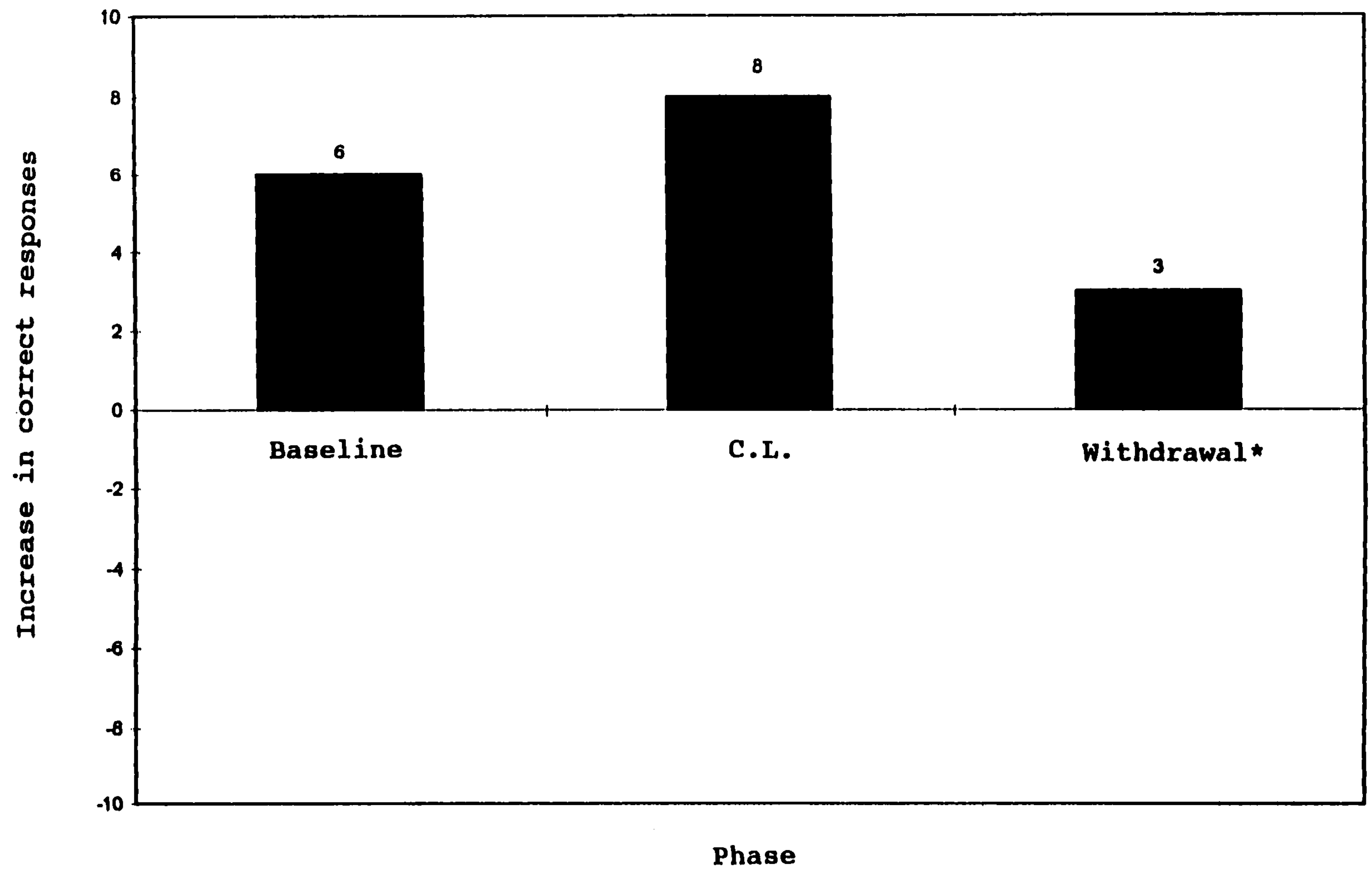


Figure 7. Mean gain scores by phase for S1. * denotes phase with only one data point.

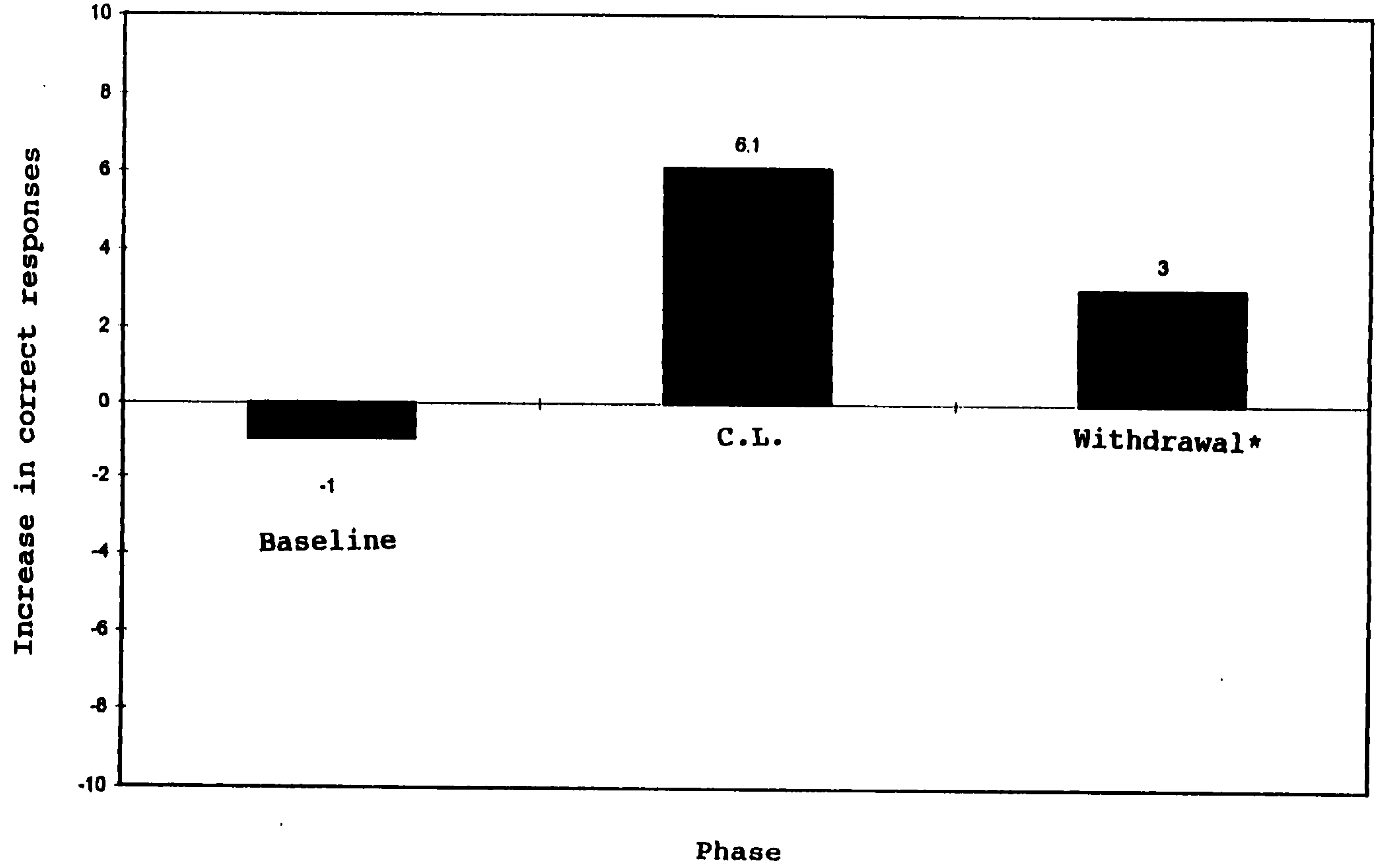


Figure 8. Mean gain scores by phase for S2. * denotes phase with only one data point.

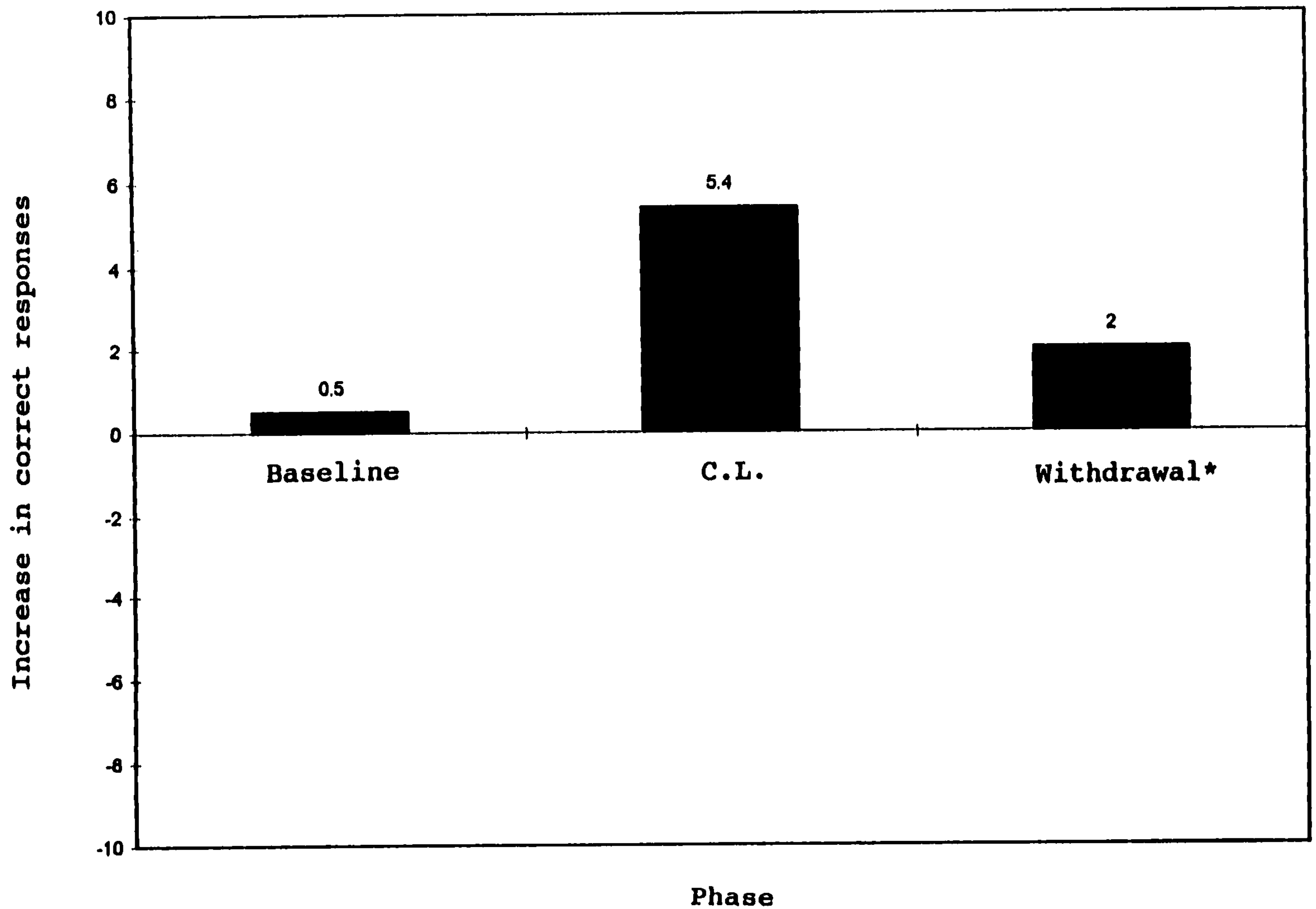
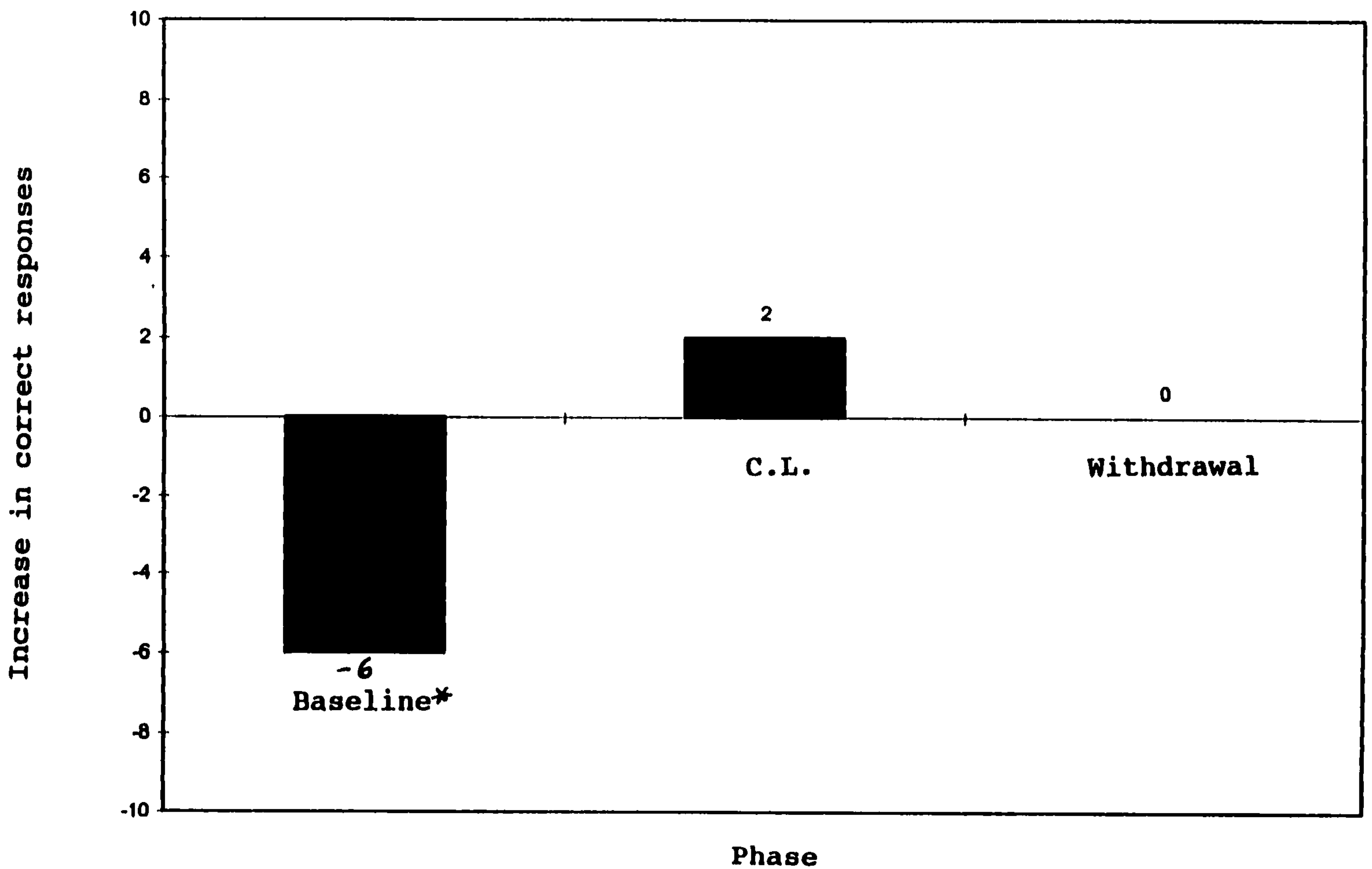
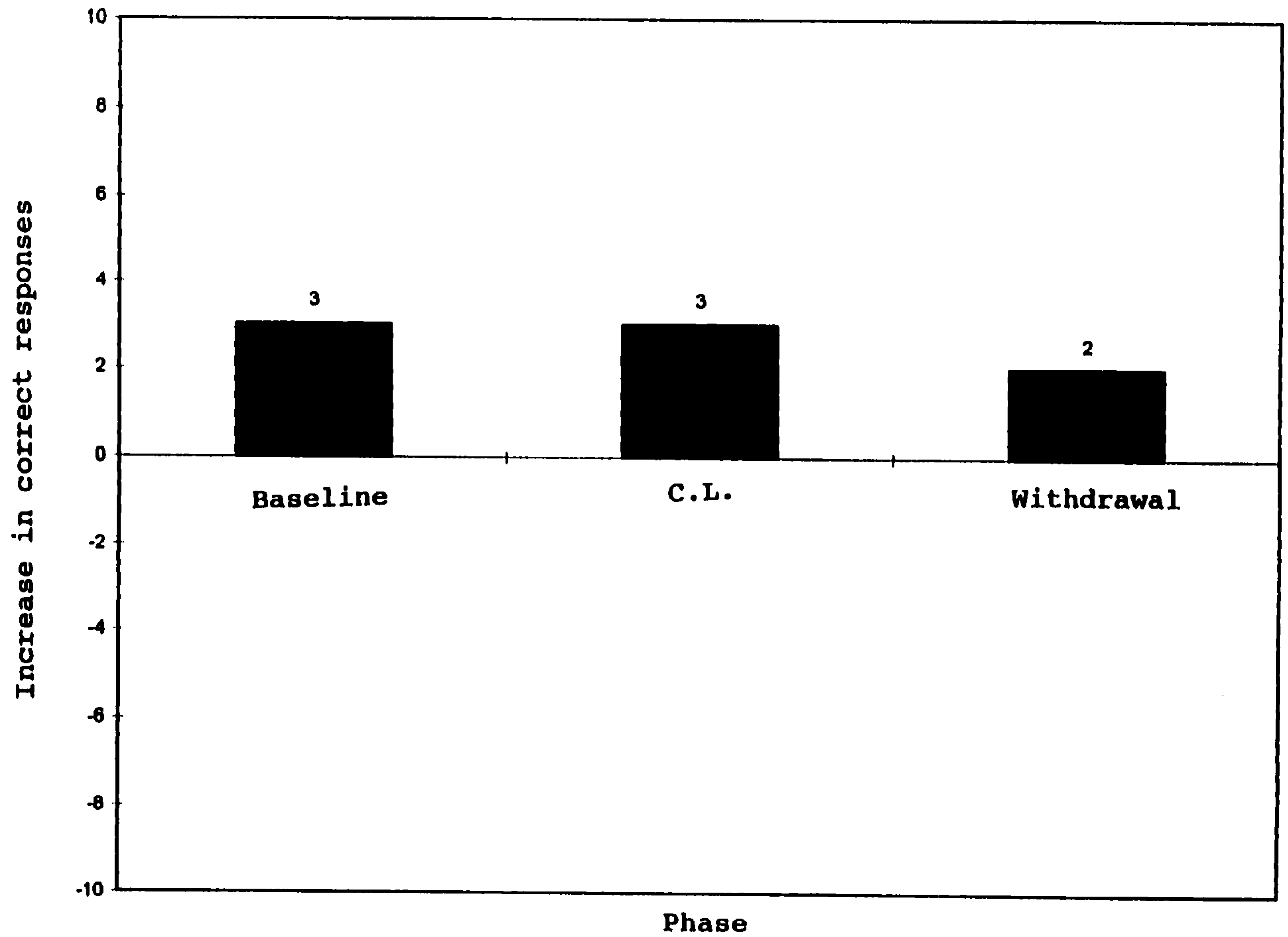


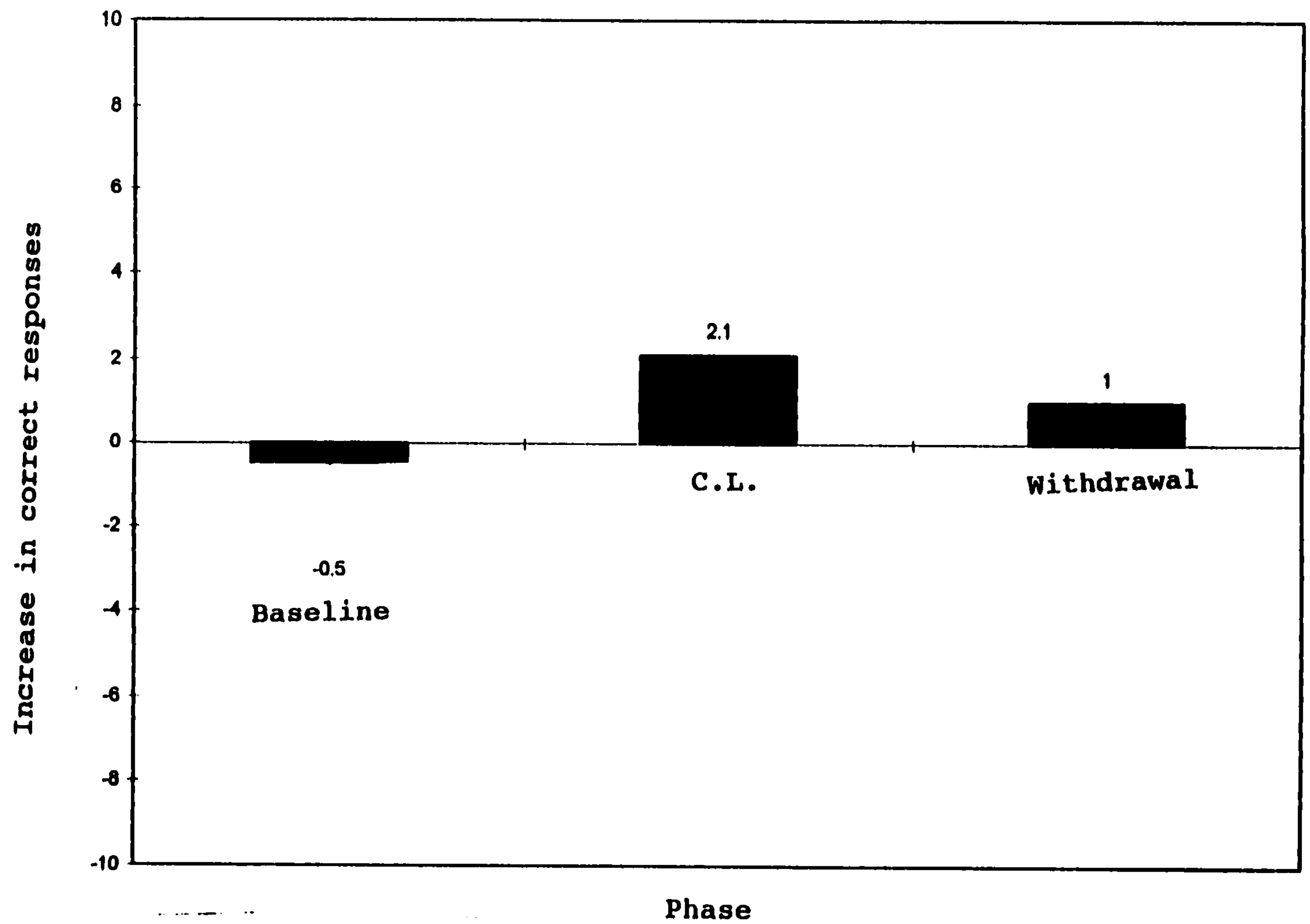
Figure 9. Mean gain scores by phase for S3. * denotes phase with only one data point.



<u>Figure 10.</u> Mean gain scores by phase for S4. * denotes phase with only one data point.



<u>Figure 11.</u> Mean gain scores by phase for S5. * denotes phase with only one data point.



<u>Figure 12.</u> Mean gain scores by phase for S6. * denotes phase with only one data point.

All students posted higher gain scores during the intervention than in the other two phases, with the exception of S5, whose average gain during the intervention was equal to his average gain during baseline. S2, one of the two students with accelerating trend lines for task-related interactions during the intervention, showed the largest increase in gain scores. S6, the other student with an accelerating trend line during the intervention, had a less dramatic improvement in gain scores during the intervention. This student's gain scores were also highly variable in all phases, lessening the strength of the evidence in favor of the intervention.

S3 is an interesting case because he showed a marked increase in gain scores during the intervention but a deceleration in task-related interactions. It is possible that the method of instruction increased his science achievement due to some factor other than the frequency of task-related interactions with peers.

It appears that C.L. may be associated with higher content-specific increases in achievement than groupwork without the C.L. conditions in place. This assertion is tentative, however, because of the small amount of data on content-specific achievement collected during the baseline and withdrawal phases.

<u>Non-task-related Interactions</u>

One of the subsidiary research questions in this study was: Do students with BD increase the number of non-task-related interactions under C.L. conditions? To answer this question I examined the frequencies of non-task-related interactions for each student across phases. These frequencies were created by collapsing all interactions (i.e. those with peers and adults) into one figure. While most of the target students' non-task-related interactions were with peers, on a few occasions students increased their non-task-related interactions with adults because of behavioral mishaps during groupwork. In order to capture all sorts of non-task-related interactions, interactions with both peers and adults were considered as evidence in attempting to answer this question. Figures 13 through 18 depict the mean levels of non-task-related interactions across phases, as well as trends for each phase. Trend lines were calculated and analyzed using the split-middle technique advocated by White (1974) and Kazdin (1982). Trend lines were not calculated for phases with less than four data points.

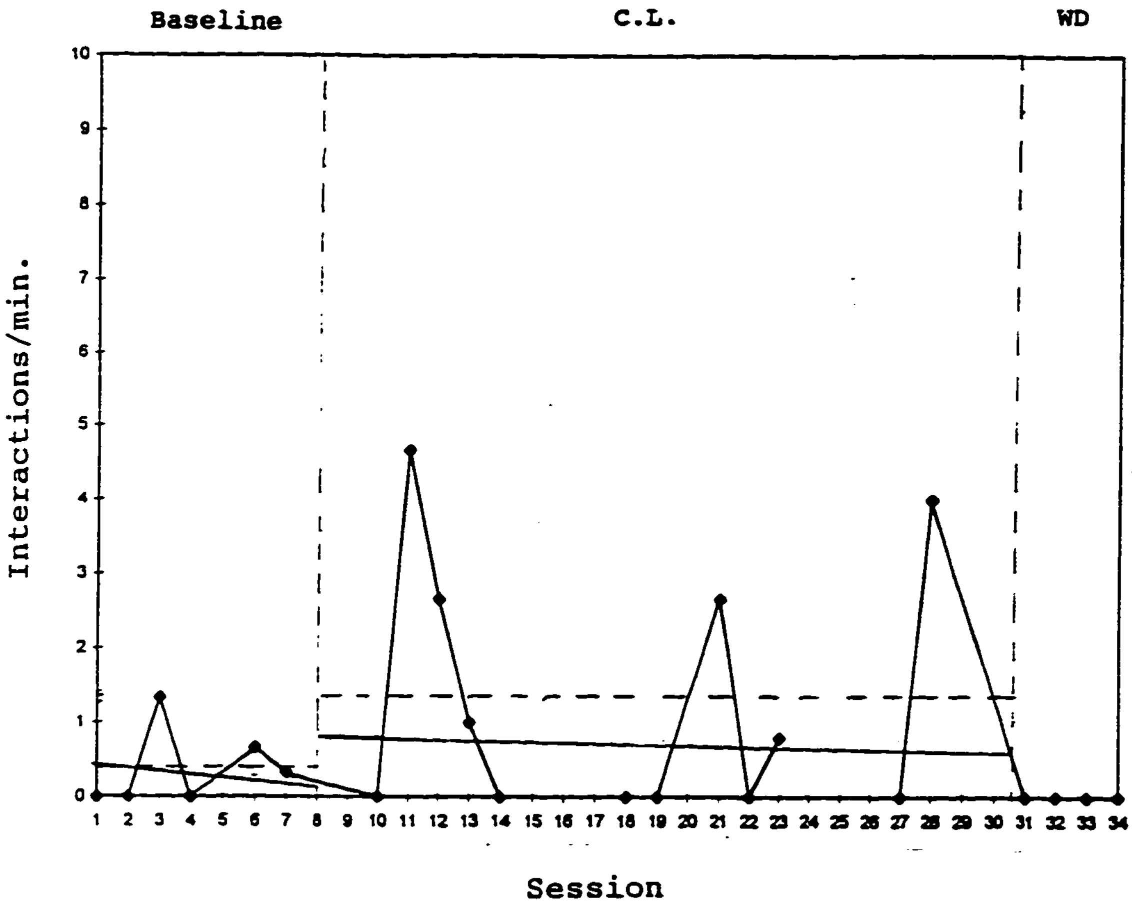


Figure 13. S1's frequency of non-task-related interactions with peers during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

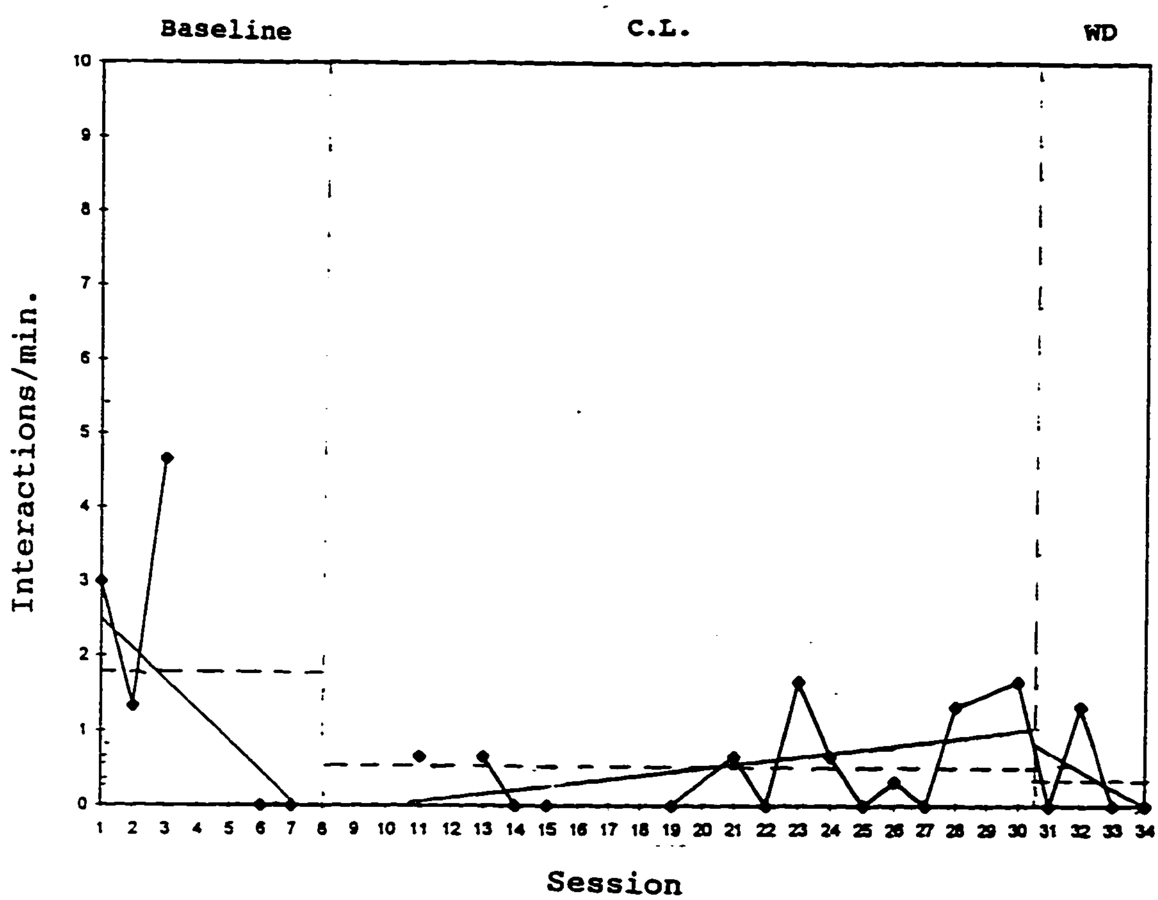


Figure 14. S2's frequency of non-task-related interactions with peers during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

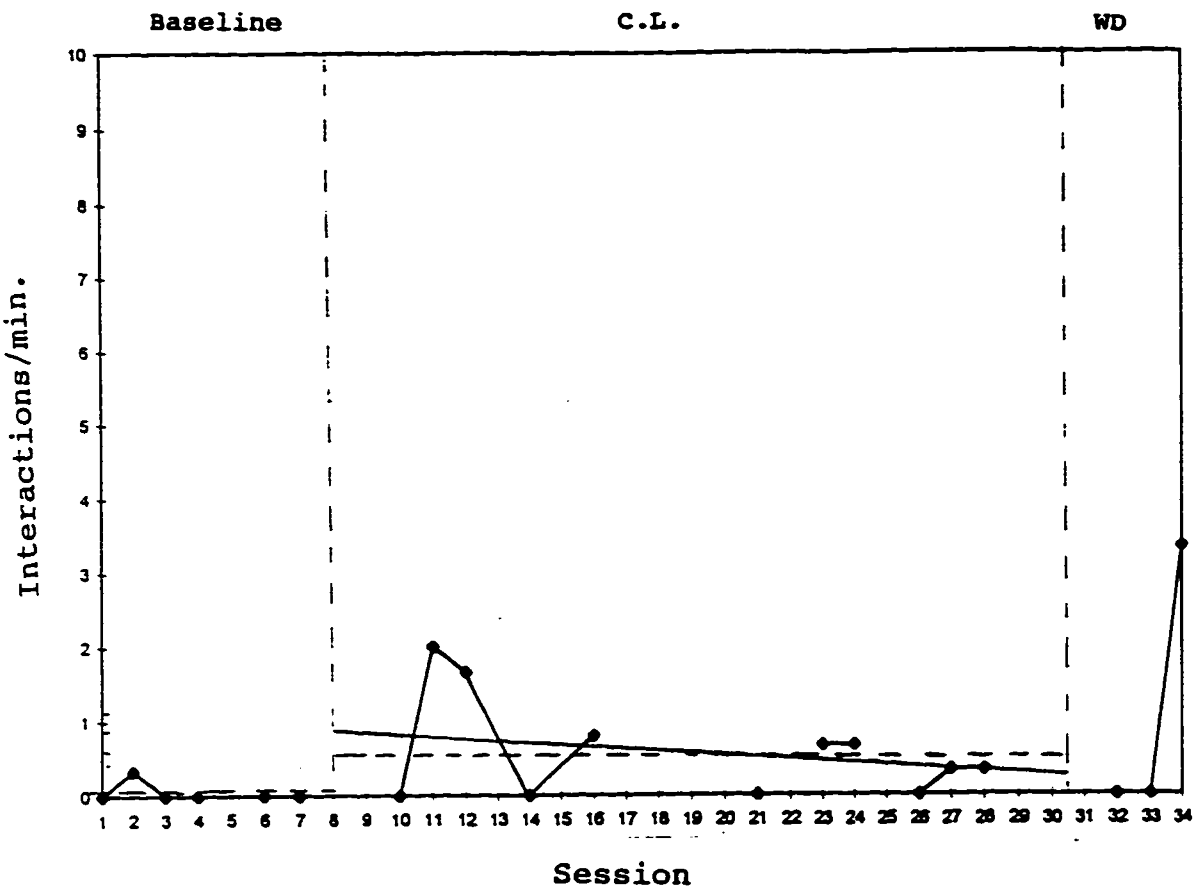


Figure 15. S3's frequency of non-task-related interactions with peers during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

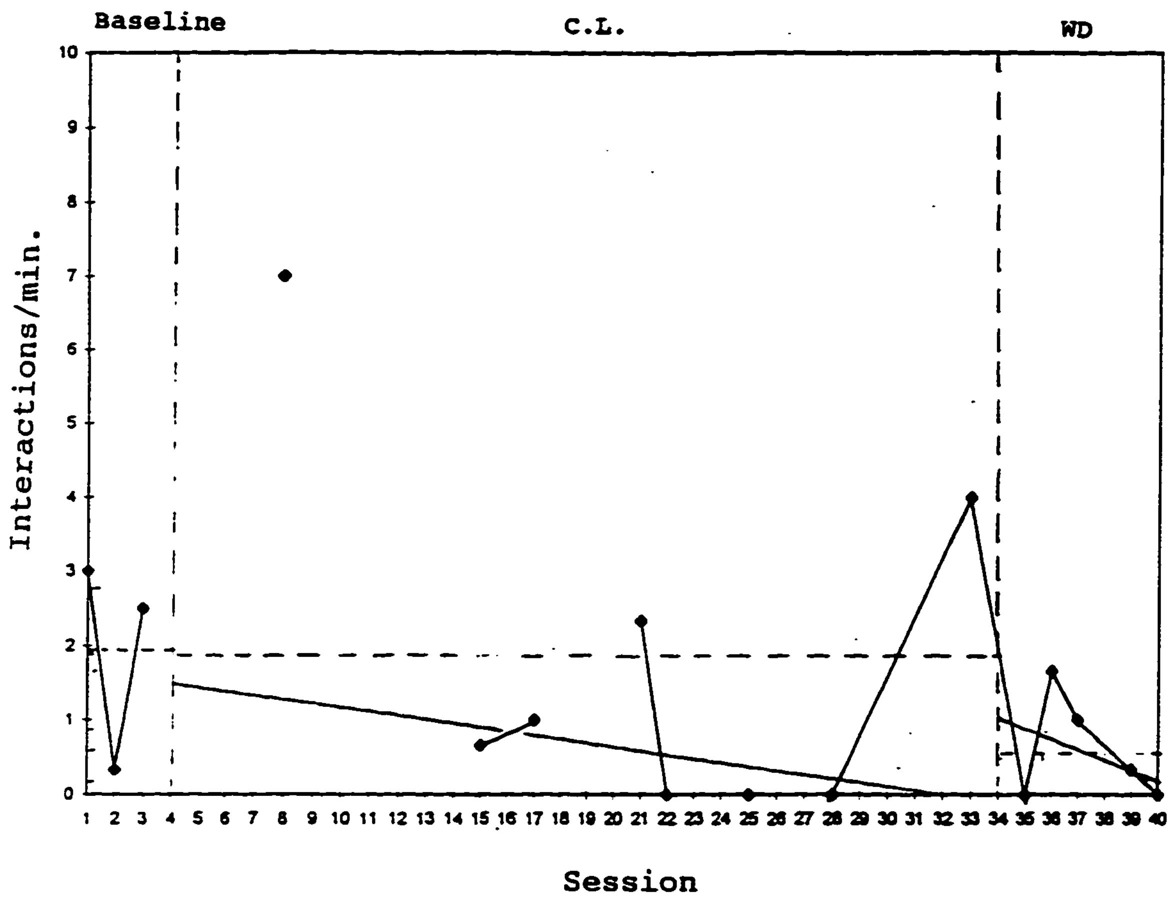


Figure 16. S4's frequency of non-task-related interactions with peers during science instruction in Classroom #2. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

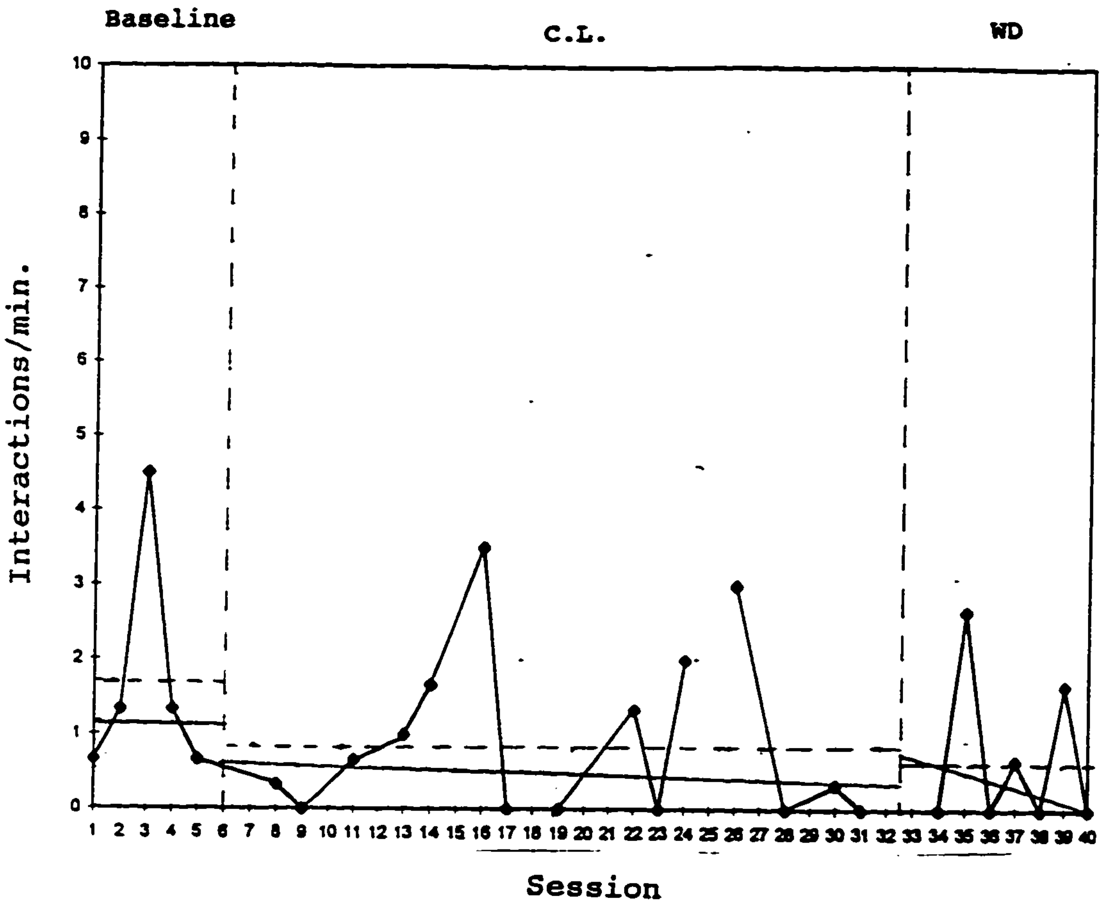
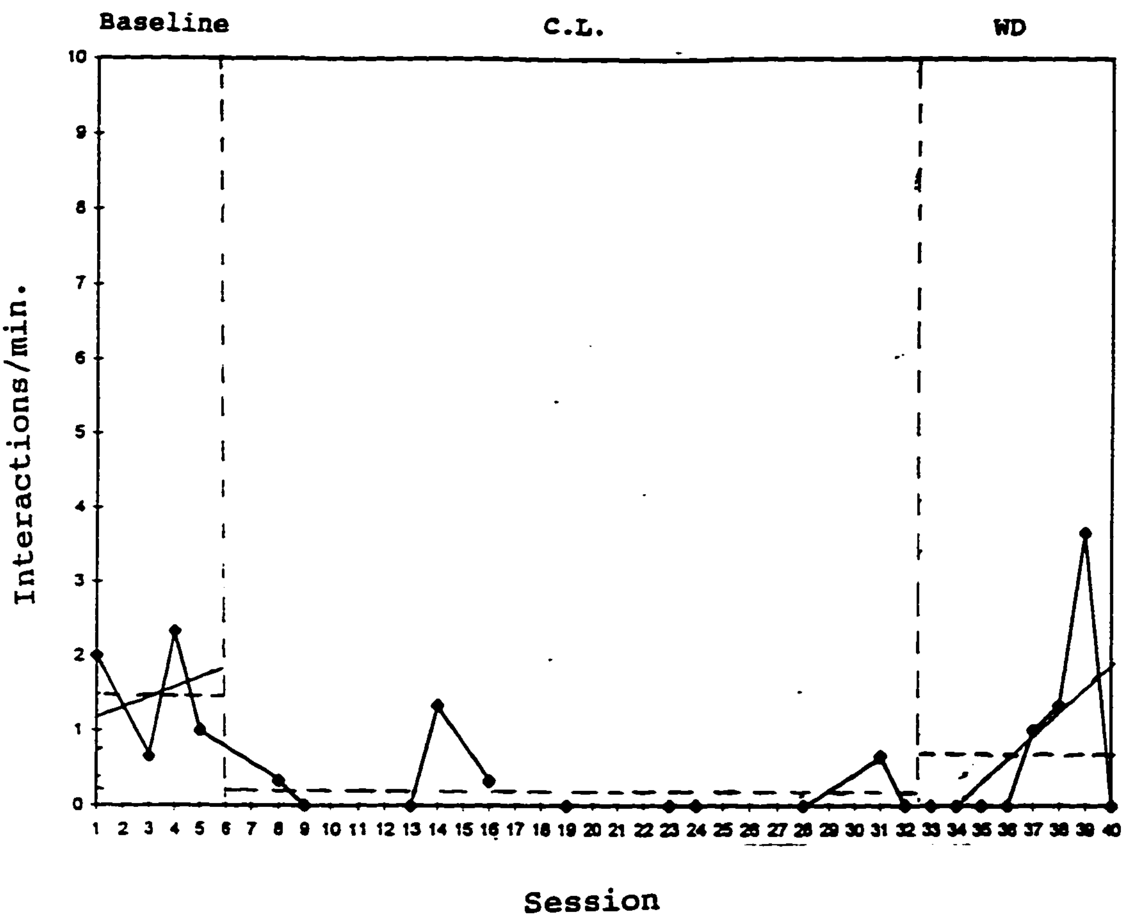


Figure 17. S5's frequency of non-task-related interactions with peers during science instruction in Classroom #3. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.



<u>Figure 18.</u> S6's frequency of non-task-related interactions with peers during science instruction in Classroom #3. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

Inconsistent effects of the intervention on mean rates of non-task-related interactions bar conclusions being drawn about the impact of C.L. on these exchanges. S2 and S6, the two students who showed accelerating trend lines for task-related interactions during the intervention, both have lower levels of non-task-related interactions during this phase. The trend for non-task-related interactions during C.L. for S2, however, is accelerating slightly, compared to decelerating trneds during both baseline and withdrawal. For S6 the trend line during baseline is flat, compared to accelerating trends in both non-C.L. phases.

Comparing frequencies of non-task-related interactions to their corresponding gain scores on a lesson-by-lesson basis did not add anything to understanding the impact of non-task-related interactions on content-specific achievement. In some lessons, higher rates of non-task-related interactions were associated with higher gain scores, while in others the higher rates of non-task-related interaction were associated with lower gain scores. This was true for every student.

Negative Peer Interactions

While coding interactions, the observers in this study made note of any obviously negative interactions, either task- or non-task-related. Negative interactions included: name-calling, angry remarks accompanied by hitting or taking of another's property, yelling, and making threats.

Any time these kinds of exchanges were seemingly made in jest or responded to with a smile or laugh -- the interaction was not noted as negative. Because conflict around academic tasks is considered a positive influence on achievement in Piagetian theory (Tudge, 1992), care was taken to only to consider negative those exchanges which had either no bearing on the task, or embedded personal attacks in a task-related exchange (e.g. ``I told you that wasn't going to float, stupid!'' or ``*That's* your drawing?! You can't draw for sh__.'')

Using these criteria, negative peer interactions were relatively scarce throughout the study. Typically they occurred in spurts when a target student was having a difficult day, as opposed to trending up or down in a phase. Rates of negative peer interactions are represented in Figures 19 through 24. No trend lines were drawn because of the low frequencies of this behavior.

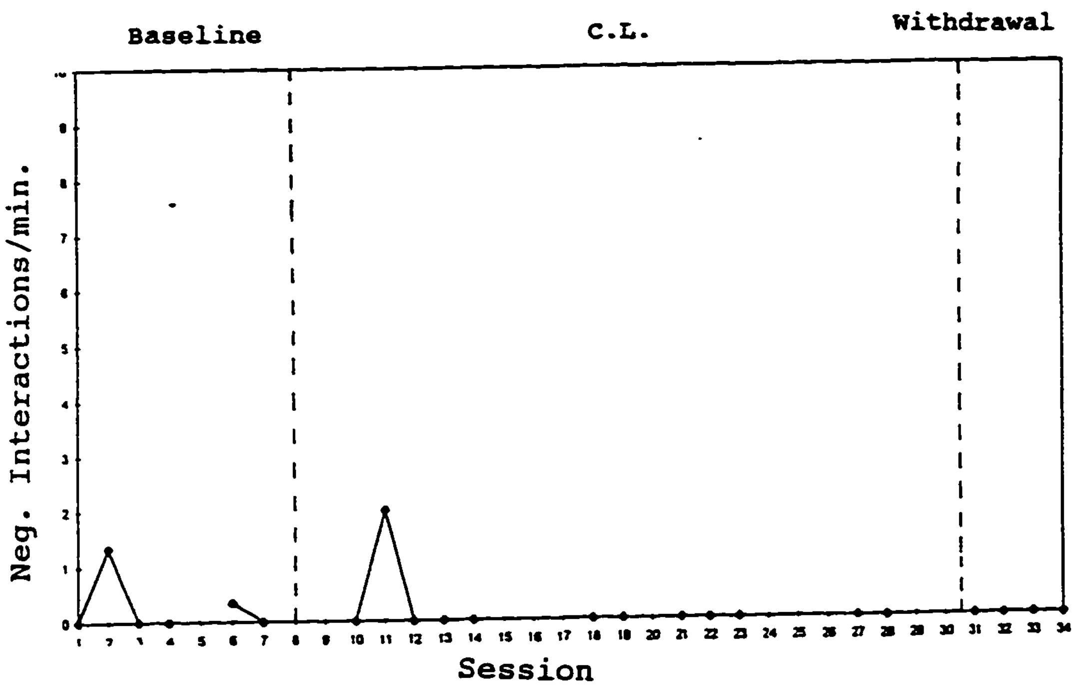


Figure 19. S1's frequency of negative peer interactions during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

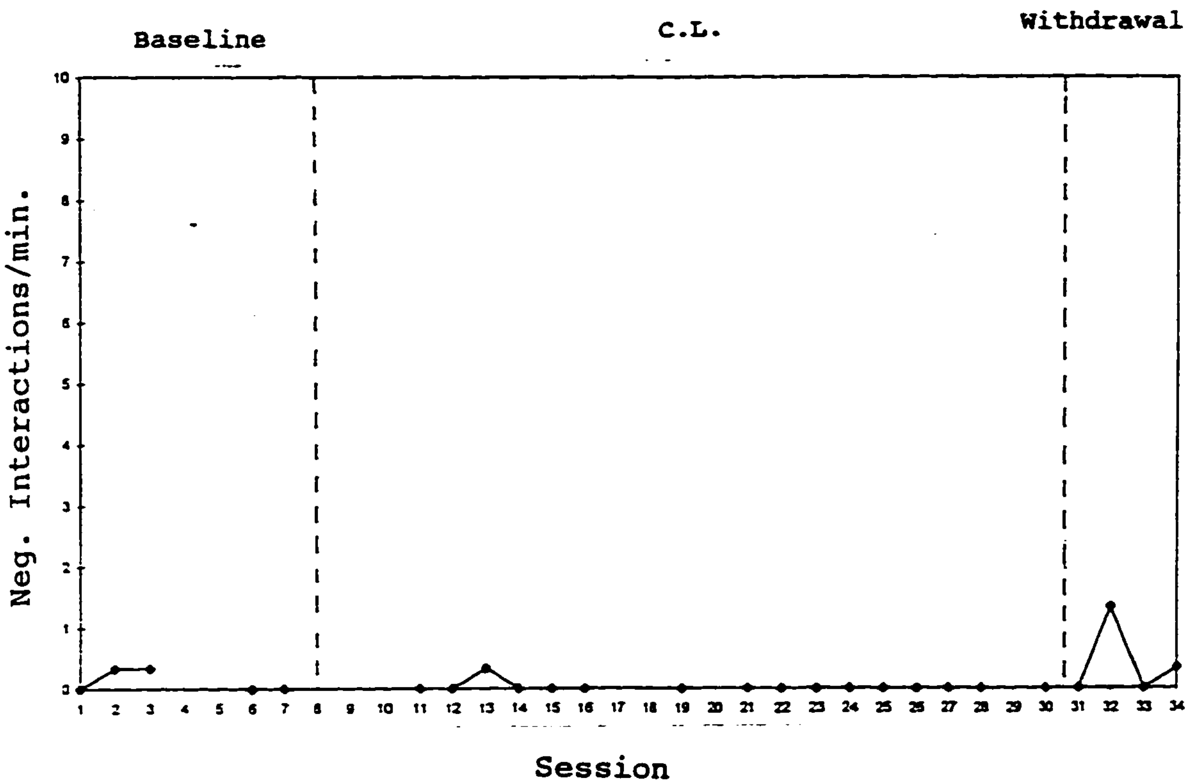


Figure 20. S2's frequency of negative peer interactions during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

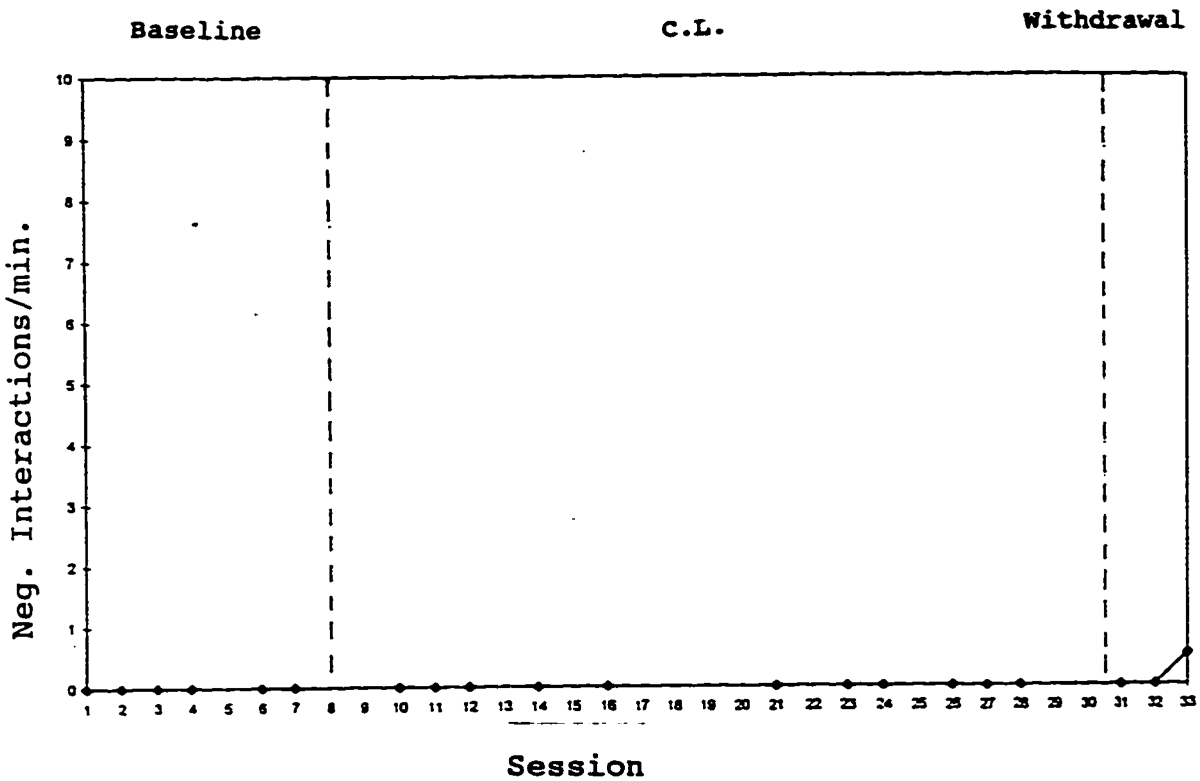


Figure 21. S3's frequency of negative peer interactions during science instruction in Classroom #1. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

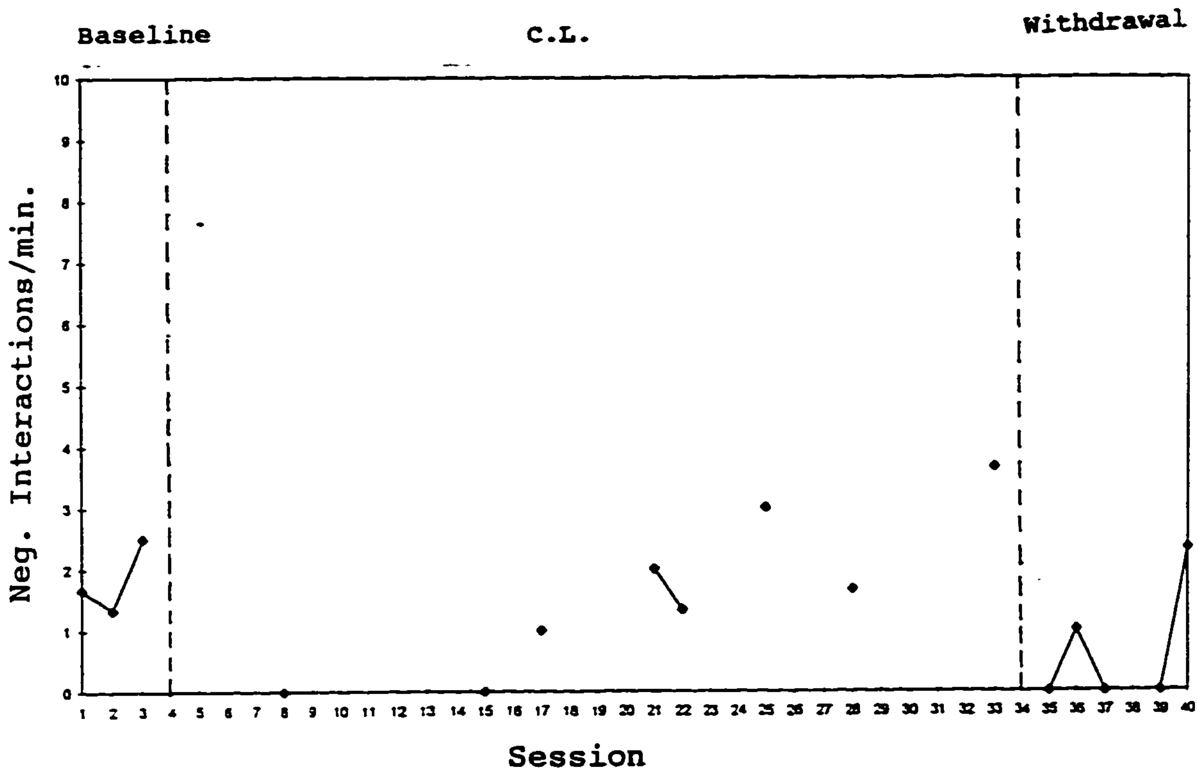


Figure 22. S4's frequency of negative peer interactions during science instruction in Classroom #2. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

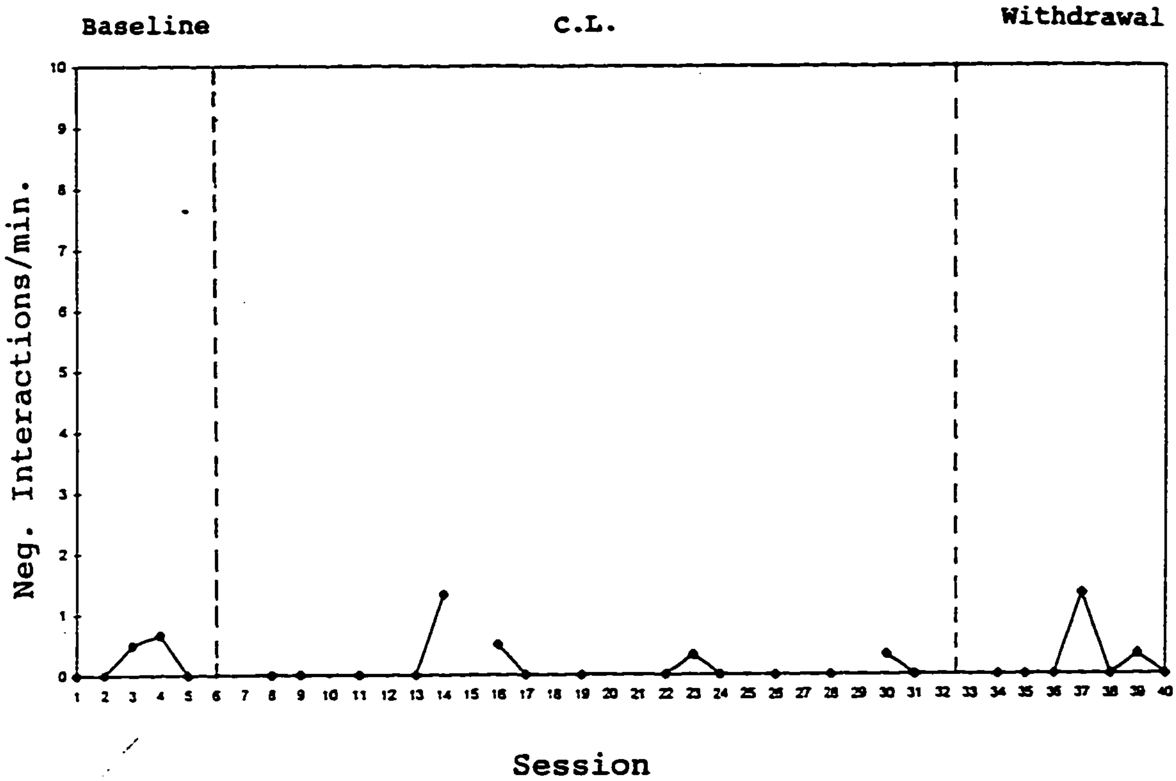


Figure 23. S5's frequency of negative peer interactions during science instruction in Classroom #3 Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

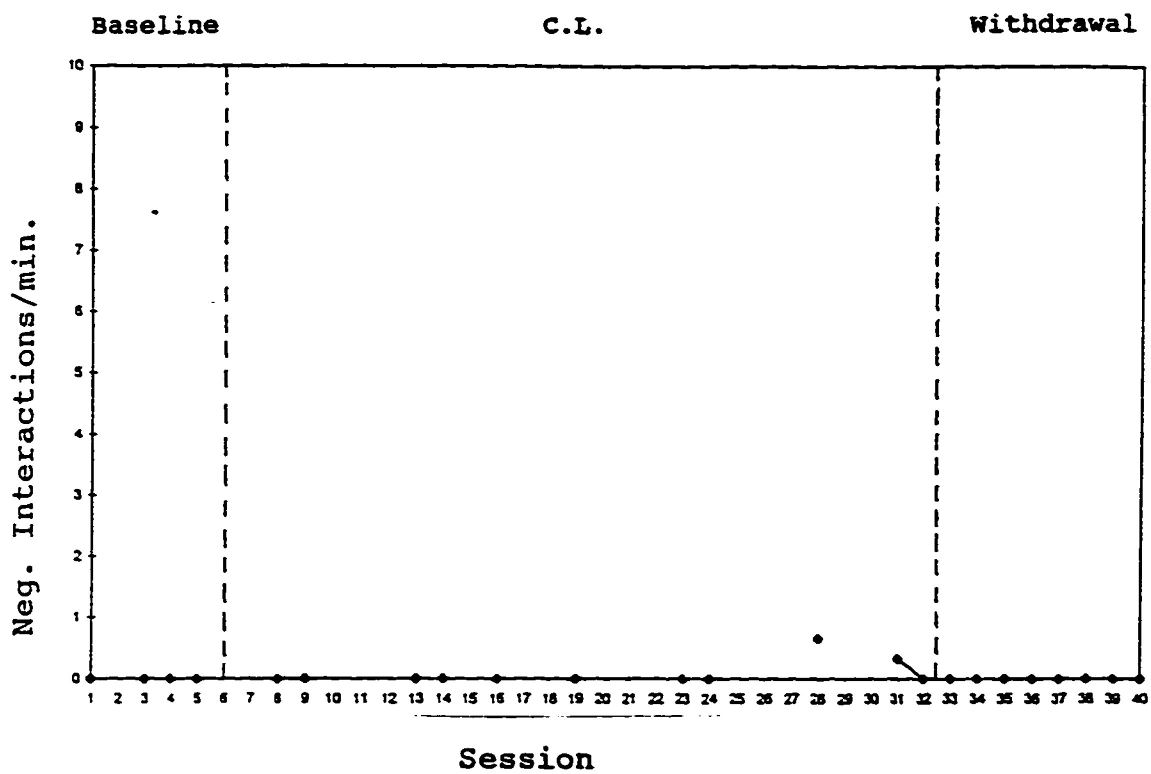


Figure 24. S6's frequency of negative peer interactions during science instruction in Classroom #3. Horizontal dashed lines represent the mean rate of interactions for each phase. Vertical dashed lines delineate the three phases. Sessions reflect the school days on which it was possible for science instruction to take place.

S4 was the only student who regularly participated in negative peer interactions throughout the study. (See Figure 22.) The data for S4 suggests that the frequency of S4's negative peer interactions was increasing during the C.L. phase. S4 was the only student for whom this pattern was exhibited, however, and the behavior cannot therefore be attributed to the intervention.

Figure 23 shows that S5 had low rates of negative peer interactions periodically throughout all phases. Anecdotal evidence recorded by observers suggests that these interactions coincided with the presence or absence of a particular group member with whom the target student did not get along.

Conclusion

While the addition of C.L. conditions to the science lessons in the three experimental classrooms did not result in conclusive evidence in favor of the intervention, neither did it cause negative results -- either in terms of task-related interactions or content-specific achievement. In the following chapter implications of the findings reported here and a discussion of possible mitigating factors are explored.

Chapter 5

Discussion

This study was designed to examine the effects of introducing a specific type of cooperative learning into regular education classrooms where students with BD were being educated. Of specific interest were the following questions: Do students with BD increase the number of peer interactions related to the academic task under the cooperative learning (C.L.) conditions instigated in this study? Do those students gain in subject specific content knowledge upon the initiation of C.L. groups?

The data collected in this study did not support the hypothesis that task-related interactions between students with BD and their nondisabled peers would increase in frequency under C.L. conditions. While individual students showed increases in frequency of task-related interactions, inconsistent results across students and variability within phases precluded a conclusion being drawn in favor of C.L. Limitations in the interpretation of findings due to the implementation of the multiple baseline design are discussed later in this chapter.

The second research question, regarding subject specific content knowledge, could not be sufficiently answered with the data collected given the low number of data points in the baseline and/or withdrawal phases for some students and the variability demonstrated in the intervention phase. While 5 out of 6 students showed increases in their mean gain scores during the intervention, it is imprudent to assume that their mean gain scores in the non-intervention phases might not have increased given more time.

Relationship of Findings to Theory and Past Research

Piagetian and Vygotskyian theory, which serve as the basis for cooperative learning research in general, suggest that heterogeneous groups of peers working toward cooperative group goals will lay the foundation for increased task-related interactions which will then lead to increased achievement. In this study, students worked in heterogeneous-ability groups on cooperative tasks during science instruction. Science instruction was chosen because of prior research relating heterogeneous groupings to increased achievement in that subject (Lou, et al., 1996).

Because students with BD are typically low-status, the element of ``equal opportunities for success'' was added to the cooperative learning intervention employed in this study in order to create group tasks in which all students could feasibly contribute to the good of the group. According to Allport's (1954) contact theory of inter-group relations, this should have led to more positive interactions for those students perceived to be different from the mainstream (e.g. students with BD).

Finally, because a lack of motivation to work together can impede a group's success (Tudge, 1992), and because students with BD historically fail to thrive in academic interventions designed for regular education, interdependent group rewards were used in conjunction with the group goals. Past research suggests that utilizing a group reward should have maximized the positive effects of the groupwork for all students -- but especially those considered low-status or low-ability (Slavin, 1995).

Nonetheless, with all of these elements in place, the C.L. intervention employed in this study did not have a noticeable impact on frequencies of task-related interactions for the students with BD. The issue of content specific academic gains is more clouded given the incertitude with which we must view the data collected to address this issue. One conclusion that I have drawn from the results of this study, however, is that the elements drawn out here as critical for the success of cooperative learning for students with BD are either *not* the most important elements, or only *part* of the structure required for this type of intervention to be successful with these students.

It is often assumed that students with BD will have difficulty in less structured learning environments, like non-teacher-directed small group instruction. For this reason, two other aspects of the C.L. groupwork were examined in this study. First of all, frequency of non-task-related interaction was measured to assess whether instructing students with BD in C.L. groups would lead to an increase in non-task-related interactions -- which could possibly impact the learning of all group members because non-task-related interactions compete directly for time with task-related interactions. The second aspect measured was the frequency of negative peer interactions engaged in by the students with BD. Allport (1954) theorized that task-related interactions would increase with positive peer relationships. If utilizing C.L. groups in instruction only set the stage for negative interactions, (distinguished from task-related arguments), the intervention would likely not be successful for students with BD.

The answers to both of these subsidiary questions had the potential to shed light on why task-related interactions did not increase for the students with BD when the C.L. intervention was initiated. Examination of the frequencies of non-task-related and negative interactions, however, reveal that neither of these types of interactions increased during the intervention and can thus not be used to explain the failure of C.L. to affect task-related interactions.

All of this is not to imply that the intervention was a failure: task-related interactions did not decline appreciably and *all* students showed growth in science during the intervention. Unforeseen impediments in the research sites and limitations due to the design of this study are discussed below and may explain some of the inconsistent results that were found.

Limitations Due to Implementation of the Research Design

Comparison across phases. Critical to the multiple baseline design is the comparison of performance across baselines at the same points in time. In the current study, the C.L. intervention was instigated in Classroom #2 at session 4. The performance of S4, the lone participant in Classroom #2, should then have been compared to the performance of the participants in the other classrooms who were still experiencing baseline conditions. The baselines not receiving treatment should have showed only normal fluctuations -- serving as a model of what S4's performance could have been expected to look like had the intervention not been implemented at that point in time. Unfortunately, due to absences from the classroom, S4 did not actually experience the C.L. condition until session 8 -- three days after the baseline phase was discontinued in Classroom #2 and one day after the discontinuation of baseline in Classroom #1. Therefore, S4's behavior at the onset of the intervention could not be compared to the behavior of students in other classrooms who were still experiencing the baseline condition -- taking value away from one of the unique features of a multiple baseline design. If intervention effects had been noticeable, this flaw in the implementation of the design would have seriously hampered this investigator's ability to attribute them to the intervention by making it impossible to rule out possible effects of extraneous factors.

This problem could have been averted by extending the baseline phases in the other classrooms until S4 exhibited stable performance in the intervention phase. Scheduling constraints in the classrooms prevented this solution from being carried out, in this case compromising the study's design.

Trends in the data. Drawing inferences about intervention effects is uncomplicated when baseline behavior shows no trend, or shows a trend in the direction opposite of that desired. In this study, however, baseline levels of task-related interactions showed improving trends, (i.e. trends in the desired direction), for 4 of the 6 participants. In a multiple baseline design, baseline trends in a therapeutic direction do not usually compromise the design (Kazdin, 1982, p. 264). This is because conclusions about intervention effects are drawn based on the pattern of data *across* baselines. In this study, however, the failure to establish overlap of intervention and baselines in all classrooms makes discussion of ambiguous effects a moot point.

Obstacles to the Theoretical Relationship

Several obstacles to the theoretical relationship between C.L. and task-related interactions were noted in this study. Some of these obstacles were related to the students' programs and others were related to characteristics of the students which related to their disability.

Fragmentation due to special education services. An issue that is germane to students with special needs but of almost negligible concern in the education of nondisabled students is the issue of fragmentation. Every student in this study missed at least two science sessions because he or she was pulled out of class to receive related services (e.g. counseling, speech therapy) or undergo IEP testing. On several other occasions, target students joined a session late (missing part of the teacher's presentation) or left early (unable to complete the C.L. activity) for these same reasons. While there was no obvious relationship between lessons in which one or more sessions was missed because of pull-out services or IEP testing and frequencies of task-related interactions or gain scores -- the possible impact of this fragmentation on interactions and learning cannot be discounted.

Fragmentation due to problematic behavior. In addition to special education related services, behavioral difficulties also led to target students missing all or part of science sessions. S3, S4, and S6 all spent considerable time in a time out area during science instruction. S6 missed the beginning of several sessions because he was involved in ``problem-solving'' with other students. Missed class time could have detracted from the students' learning of academic content and/or jeopardized the students' ability to bond with their groups and become invested in their groups' success. With sporadic involvement in the C.L. activities, students with BD can lose out not only on contact with content, but also in opportunities to build relationships that might eventually enrich achievement. Unfortunately, it was not until mid-way through the study that I began to collect data on amount of science instruction missed and reasons for missed sessions. In the future, I would include this as data to be collected.

Classroom management. All of the teachers in the three experimental classrooms voiced concern about the intervention phase. All three teachers were surprised by the level of acting out behavior exhibited by their students in general at the initiation of this phase. In response to their concerns, group rewards were awarded periodically throughout the science lessons instead of only after the post-tests as originally planned and the structure of implementation was changed in each classroom.

These changes in plans make it more difficult to evaluate the results of this study.

For the teacher in Classroom #1, (who was the only teacher with experience in a self-contained classroom for students with BD), teaching science in the C.L. condition went from initially problematic to smooth and problem-free by the end of the intervention. For the teacher in Classroom #2, the groupwork never progressed to running smoothly. This teacher, though experienced and seemingly committed to her students' progress, had some difficulty managing behaviors in her classroom before the intervention began. These problems were exacerbated during the C.L. phase. She put off completing science lessons, leaving several days between sessions. These lags in sessions might have detracted from her groups' abilities to firm up their overall commitment to working together as groups. The teacher in Classroom #3 avoided initial deterioration of behaviors in her classroom by instigating the groupwork in small pieces. She gradually lengthened their allotted time to work in groups from 3 minute segments up to 10 minute segments. This strategy circumvented disintegration of the classroom's behavior, but may have prevented higher-level discussions which might have facilitated larger academic gains for her students. The teachers responses to the influx of new behaviors when the C.L. groups were initiated may have directly influence the success of the intervention in general.

Implications for Research

The instigation of cooperative learning in any classroom affects countless aspects of teaching and learning. In framing this study I attempted to target those aspects of cooperative learning which would have the most impact on students with BD in regular education classrooms: composition of the group, positive reward interdependence, equal opportunities for success. The results of this study indicated that other factors, not measured, were playing significant roles -- either directly or in conjunction with other factors.

I believe that one important step in establishing the efficacy of C.L. as an academic intervention for students with BD is qualitatively studying groupwork in which students with BD interact with nondisabled peers. Analyzing the content of entire groupwork sessions over time might establish sub-categories of interaction which have a more direct relationship to increased content knowledge than the categories measured here. This type of study would also allow researchers to pick up on other factors, be they antecedent events or scheduling constraints, that effect the types of interactions that take place in the groups. Some factors, like fragmentation of services or style of classroom management, might be able to be controlled for in future studies like the one undertaken here. Other factors, specific to the students and tied to the category of disability, may be important to keep track of but cannot be controlled for. If cooperative learning is to be a useful educational tool for regular educators of students with BD, it must be a powerful enough intervention to suppress or change difficult behaviors or it must be able to register gains in task-related interaction and achievement *in spite* of the problematic behaviors so often demonstrated by these students.

The current study could not conclusively attest to benefits of C.L. to students with BD in inclusive classrooms. All of the target students did, however, experience some measure of success during the intervention -- providing the rationale for my belief that this intervention merits further research.

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APPENDIX

Child Observation Instrument

and

Guidelines and Scoring Manual

Student:______________________ Date:________________

Observer:______________________

Target of Talk: **T** = Teacher, **A** = Aide, **S** = Other Student, **G** = Group of Students

	Minute #1		Minute #2		Minute #3	
T.S. Talk	30 sec.	30 sec.	30 sec.	30 sec.	30 sec.	30 sec.
Task-Related						
Requests Assistance						
Offers, Gives Assist.						
Non-task Related						

T.S. Behavior						
Clearly On Task						
Clearly Off Task						
Can't Tell						
In Transition (on business)						

Activity Coding:

Check off if you saw the student engaged in these activities at least once during the three minute observation period. Check off as many as apply.

_______ Reading, Writing, Computing

_______ Manipulating Materials, Drawing

_______ Explaining, Reasoning, Arguing on Task

Describe briefly what the student was doing while you were observing. Particularly note circumstances in which s/he was disengaged. Put down kinds of talk on task you heard.

Target Student Observation
Adapted from Cohen, E. G., & Lotan, R. L. (1995)

GUIDELINES AND SCORING MANUAL

This observation scheme is designed to capture task-related learning activities and the occurrence of disengagement among selected students. It focuses especially on verbal participation and can be used as a measure of the effects of status in the classroom and delegation of authority to lateral relations among the students.

The observer will study one student at a time in a classroom for 3 minutes of timed scoring. The order of observation during a visit will change with each visit. There will be a separate observation schedule sheet for each student for each 3 minute observation. Each 3 minute observation is further subdivided into minute and 30 second intervals.

At the start of each observation, before the timing begins, the observer locates the target student and fills out the part of the observation sheet which contains all the identifying data.

TIMING PROCEDURES. It is necessary to have a watch with a second hand or a stop watch in a place where you can clearly see the seconds' progress. If, for some reason, you have to pause between 30 second intervals, then wait till 30 seconds has passed and start with the next 30 second interval.

UNIT OF SPEECH. In coding speech, code only as one instance until that talk is (1) ended by the response of another person, or (2) changes into another scorable category of talk. If the speech is long and persists into the next time interval, it should be scored once more. If the target student is engaged in a conversation about a learning task with another student (S), you may score several speeches even in such a short interval as 30 seconds. Young children's speeches are typically short and every time the other student speaks, the unit of speech has ended. When the target student speaks for a second time, it counts as another score.

BEHAVIOR. The timed observation method requires checking specific observed behaviors which occur in the time intervals on the code sheet. In coding behavior, as long as that behavior is uninterrupted by another type of behavior listed on the code sheet, then make only one notation per 30 second interval. If that behavior continues into the next 30 second interval, note in once more in the next time interval.

Sometimes you will score in a speech and a behavior cell simultaneously. For example, suppose that the target student is working on his or her assignment by talking on task to another student. Score both the task-related talk cell with an S (partner in interaction) and the ``Clearly on task'' cell for that interval. Similarly, if a student is socializing with another student, score the non-task-related talk (S) and the ``Clearly off-task'' cell. **Remember:** Because the categories on Target Student Behavior are exhaustive, for each 30 second interval there must be at least one score on one of the four categories of behavior.

NOTATION SYSTEM. Check marks are used to note categories of target student behavior. Each instance of target student talk is coded with a letter denoting to whom the target student was speaking. Following are the categories,

S = another student
G = a pair or more of other students (group)
T = teacher
A = aide or other adult

Example: Suppose a teacher comes up to a target student and starts talking to him, helping him with the activity he is doing. ``Here Amelio, you are supposed to cut it this way and then do the folding.'' Amelio: ``I can't get it to stay down when I fold it.'' Teacher: ``Maybe you should get some Scotch Tape.'' This interchange all takes place within a 30 second time interval.

Score: In the target student talk, a ``T'' would be entered in the task-related talk cell. In the target student behavior section, a check would be marked in the clearly on-task cell.

MAKE SURE YOU UNDERSTAND WHY THIS EXAMPLE IS SCORED IN THIS WAY.

Non-verbal behavior: For this section of the scoring sheet you need only make a check mark in the correct cells. If the behavior is interrupted but recurs within 30 seconds it is possible to make two checks in a given cell.

Example: The target student is at work. He pauses to take a playful poke at another child who passes by. He then turns back to continue working. If this occurs with 30 seconds, there would be 2 checks in the ``On-task'' cell and one check in the ``Clearly off-task'' cell for that 30 second interval.

<u>TARGET STUDENT TALK CATEGORIES</u>

Task-related talk - Target student is talking about his or her work, broadly defined. Any remark relevant to the assigned task should be scored. If the student is responding to the instructor's question or is reciting, the response should be scored here.

Requests assistance - any verbal request for help on the assigned activity or worksheet should be scored here.

Offers assistance - Any verbal indication that student is willing to assist a peer should be scored here. If the instructor has directed the target student to go help someone and he or she goes over to offer assistance (verbally) score here.

Non-task related talk - Students may talk about their families, how other children behaved at recess, about their social life or what they are planning to do after school today. It should be clearly unrelated to the assigned task to fall into this category.

<u>TARGET STUDENT BEHAVIOR CATEGORIES</u>

Task engagement: These categories are meant to be mutually exclusive and exhaustive. If you are sure that the student actively working, then mark ``*Clearly on-task.*'' If you are sure that the student is doing something other than what the instructor would call work-related then mark ``*Clearly off-task.*'' Frequently, an older student will be gazing at the teacher or the book, but you are really not sure that his mind is engaged. He may be pretending to be attentive while he is daydreaming. A younger child may be playfully manipulating materials; he may be really learning something from this activity -- you have no way of knowing. In these cases, mark ``*Can't tell.*'' Cues for off-task include looking at unrelated pictures on wall, working on an unrelated task, interfering, teasing or playing with others, socializing, wandering around the room aimlessly, clearly playing with objects (like a pencil as opposed to playful manipulation of learning materials).

In transition (on business): Student may go to get materials. He or she may be on the way up to the teacher's desk to ask questions. The student may move from one activity to another.

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EDUCATION

1994 - 1997 **UNIVERSITY OF WASHINGTON** - Seattle, WA
College of Education, Area of Special Education, Ph.D.

- Areas of specialization include: Education of children with behavioral disorders; transition and long-term outcomes for youth with mild disabilities; alternative assessments of change; and personality growth and development.

1989 - 1991 **UNIVERSITY OF WASHINGTON** - Seattle, WA
College of Education, Master of Education degree

- Special Education major concentrating in the education of children with behavior disorders.
- Initial certification with an endorsement in Special Education.

1983 - 1987 **NORTHWESTERN UNIVERSITY** - Evanston, IL
College of Arts & Sciences, Bachelor of Arts degree

- Computer Studies major concentrating in Artificial Intelligence, with significant coursework in the Social Sciences.

PROFESSIONAL EXPERIENCE

June 1996 to to August 1996 **UNIVERSITY OF WASHINGTON** - Seattle, WA
Predoctoral Teaching Associate. Responsible for the preparation and presentation of materials and the assessment of student learning in two graduate-level Special Education courses. Co-taught an additional course in the Teacher Education program.

June 1995 to August 1995 **UNIVERSITY OF WASHINGTON** - Seattle, WA
Predoctoral Teaching Associate. Assisted in the preparation of materials and the assessment of student learning in two graduate-level Special Education courses. Co-led discussions and presented new material.

August 1994 to October 1994	**SEATTLE PUBLIC SCHOOLS** - Seattle, WA *Special Education Consultant.* Observed and provided feedback to a newly hired Special Education teacher. Served as a resource for this teacher by providing possible instructional and classroom management techniques and materials.
August 1991 to August 1994	**SEATTLE PUBLIC SCHOOLS** - Seattle, WA *Special Education Teacher, John Muir Elementary School.* Intermediate self-contained classroom for students with Serious Behavior Disorders. Worked in a team room with a "gifted" classroom to give my students maximum opportunity for interaction with mainstream students. Teamed with regular education staff members to develop curriculum. Member of site-based Waiver Committee responsible for the hiring of new teachers. Taught in a collaborative setting with Seattle Mental Health Institute counselors for four quarters.

PUBLICATIONS

Malmgren, K., Edgar, E., Neel, R. S. (in press). Post-school status of youth with behavioral disorders. Behavioral Disorders.

Malmgren, K., Abbott, R., & Hawkins, J. D. (1997). Learning disabilities and juvenile delinquency: Rethinking the link. Manuscript submitted for publication.

Malmgren, K. (1997). Academic interventions for students with behavioral disorders: A review of the literature. Manuscript in preparation.

Boland, P., Broder, S., Cloud, I., Dorland, V., Malmgren, K., Montgomery, C., Nelson, H., Steele, M., Vice, C., & Swanson, J. (1992). Building a building of teacher leaders. Teacher Leadership, 5, 17-20.

PRESENTATIONS

March 1997	"Instructional Strategies for Students with Behavioral Disorders" at the Washington State Council for Exceptional Children Conference.
October 1996	"Program Implementation and Curricular Modifications for Students with Behavior Disorders" with Richard Neel and Kay Cessna at the International Adolescent Conference.

November 1995	"Post-School Status of Youth with Behavior Disorders" with Richard Neel at the Teacher Educators for Children with Behavioral Disorders (TECBD) National Conference on Severe Behavior Disorders of Children and Youth.
September 1994	"Behavior Management in the Classroom" with Robin Meyers. In-service presentation to Powerful Schools coalition staff members.
January 1994	"Managing Difficult Behavior" with Robin Meyers. In-service presentation to Powerful Schools coalition staff members.

HONORS

September 1994 to August 1997	Fellowship award from Research Careers grant supporting work in the doctoral program in Special Education.
January 1993	Selected by Seattle Public Schools Special Education Program Coordinator to be featured in a training video for newly hired self-contained classroom teachers.

MEMBERSHIPS

American Educational Research Association
Council for Exceptional Children.
Council for Children with Behavioral Disorders.

SPECIAL PROJECTS AND RESPONSIBILITIES

1996	*Special Education Search Committee.* Served as a member of the committee screening applicants for an Assistant Professor position in the Area of Special Education in the College of Education at the University of Washington.
1992 - 1994	*Leadership Team member for The Quality Management and Practices Project (QMAP).* School representative and liaison for project whose function was to ensure the inclusion of children with disabilities as part of school restructuring efforts.