Interdependent Group-Oriented Contingencies: Effects Upon Collateral Behaviors.

Verdi Rountree Lethermon

Louisiana State University and Agricultural & Mechanical College

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Interdependent group-oriented contingencies: Effects upon collateral behaviors

Lethermon, Verdi Rountree, Ph.D.

The Louisiana State University and Agricultural and Mechanical Col., 1987
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INTERDEPENDENT GROUP-ORIENTED CONTINGENCIES:
EFFECTS UPON COLLATERAL BEHAVIORS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Psychology

by

Verdi Rountree Lethermon
B.A., Southern University and A & M College, 1976
M.A., Louisiana State University, 1981
December 1987
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... But I knew I had to turn these obstacles into stepping stones because someone else knew I could. (They) believed in me even when I didn't believe in myself. That kind of love is very powerful. It provides strength, incentive, meaning and a desire to pass it on to someone who may need it now as much as I needed it then... It's also the reason why I can't quit.

No, I couldn't quit, and I didn't quit and now I would like to take this opportunity to express my appreciation to those that believed in me.

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Abstract

Two interdependent group-oriented contingency (g-o-c) systems to improve academic behavior were compared to a no treatment control group. Additionally, the two interdependent group-oriented contingency systems were compared to each other regarding their effects on several collateral behaviors (classroom behavior, social interactions and peer sociometric ratings).

Six fourth and fifth grade classes (126 students) were randomly assigned to three experimental conditions. The first treatment group (positive g-o-c) was an interdependent group-oriented contingency system which reinforced overall science performance at or better than a level of 90%. The second treatment group (negative g-o-c) was also an interdependent group-oriented contingency system which discouraged students from allowing their classroom science average to fall below 90%. The third experimental condition was a no treatment control group. Dependent variables were measured during Baseline and Phase-1 and Phase-2 treatments. The study was conducted over a six-week period (each phase spanned two weeks).

The results of this study showed that although the academic performance for the interdependent g-o-cs was higher than the control group during treatment, this
pattern of performance was also present during Baseline. Classroom behavior was not affected by the treatments; yet social interactions and peer sociometric ratings differed. During the treatment phases, the treatment groups demonstrated improved positive and neutral social interactions. The treatment groups also received lower sociometric ratings during Phase-1, but this pattern did not continue into Phase-2. Teacher and student acceptance ratings supported the use of interdependent group-oriented contingencies to improve academic performance. Student acceptance ratings were more favorable and social interactions were more often positive under the positive g-o-c conditions. The acceptance data also highlighted subtle perceptual differences between students and teachers relative to the two treatments.

The major findings were: 1) academic performance was confounded by Baseline group differences; 2) classroom behavior was not affected by the treatments; 3) under the group-oriented contingencies positive and neutral peer social interactions improved; 4) peer sociometric ratings did not permanently decrease as a function of the group-oriented contingencies; and 5) teachers and students rated the interventions acceptable, with student responses and social behavior reflecting a small advantage for the positive g-o-c.
INTRODUCTION

The purpose of this study was two-fold: 1) to compare the relative efficacy of two variations of an interdependent group-oriented contingency system (one designed to improve academic performance and one designed to decrease poor academic performance and 2) to systematically analyze the collateral effects of each variation of the interdependent group-oriented contingency program on classroom behavior, sociometric status, and student social interaction patterns.

The sections that follow review the use of behavior management in schools; group-oriented contingency systems; and collateral effects of group-oriented contingency systems. A final section summarizes the major issues addressed by this study.

Behavior Management in Schools

Children have always had behavioral and emotional problems, but these problems have not always been considered worthy of special attention (O'Leary & O'Leary, 1972). Through the ages, children who exhibited behavioral problems were "variously labeled . . ."
possessed, wicked, guilty, insubordinate, incorrigible, unstable, maladjusted and problem children, roughly in that order" (Despert, 1965, p. 38). Fortunately, there has been a dramatic change in attitude toward children's problems. With this change in attitude has come the development of various psychoeducational approaches to the treatment of children.

The current psychological attitude toward the treatment of children exhibiting behavior problems is demonstrated through the work of Barth (1983) and Keisling (1983) who identified several problem behaviors in children which may be predictive of psychological disturbance in adulthood (Joint Commission on Mental Health of Children, 1970; Robins, 1966). According to Barth and Keisling, children most vulnerable for the development of later emotional and behavioral disorders are those who do not exhibit age-appropriate social and academic skills. Current child development literature cites three critical characteristics of "at risk" children:

"1) lack of academic productivity commensurate with ability
2) lack of self-control evidenced by classroom misconduct, and
3) lack of social acceptance and cooperative behavior with peers" (Pigott, Fantuzzo, Heggie, Clement, et al., 1985, p. 42).
In response to these findings researchers have begun to target academic deficiencies, classroom deportment and social behavior (Ruggles & LeBlanc, 1982) through innovative behavior change techniques.

Despite the alarming nature of recent child development literature pointing to an eminent need for school-based interventions to remediate students' social and academic difficulties, researchers often have met significant resistance when attempting to implement classroom behavior management programs. This resistance is due in part to the current plight of public schools which find themselves troubled by spiraling costs, financial cutbacks, and declining achievement. Consequently, school personnel appear hesitant to welcome innovations which seem likely to increase their work, and which may or may not significantly lessen students' academic and behavioral difficulties.

The current status of behavior management techniques in the public schools has been clearly addressed in the literature. Witt (1986) reports that despite the proliferation of literature on the effectiveness of behavior management techniques, the techniques are infrequently used by school personnel to remediate behavior and academic
problems. The incongruity between the availability of behavior management techniques and their application has raised many questions (Witt, 1986). For example, Why are classroom interventions which are discussed so prevalently in educational and psychological journals, used infrequently in actual classrooms? Others ask, why are some teachers unreceptive to the use of behavioral interventions in the classroom? Finally, some question why specific behavioral interventions appear workable on paper but often fail when practically applied in the classroom—even if the teacher is enthusiastic about the technique. To obtain answers to these questions, several researchers called upon teachers to identify factors that influenced their decision to use a particular behavioral intervention (Elliott, Witt, Galvin & Peterson, 1984; Martens, Witt, Elliott & Darveaux, 1985; Sarason, 1982; Voeltz & Evans, 1982; Witt, 1986; Witt, Martens & Elliott, 1984; Witt, Moe, Gutkin & Andrews, 1984).

When empirically studied, teachers frequently identify pragmatic, theoretical, and ethical factors which influence their choice of behavioral classroom interventions. Teachers are concerned about the
relative effectiveness of an intervention; but current research indicates that their support for the intervention is not necessarily dependent on their knowledge of empirical data supporting the efficacy of the program (Witt, 1986). Furthermore, some interventions congruent with teachers' values and common sense appear to be adopted despite an almost total absence of published research support (Witt, 1986). Consequently, researchers must consider factors other than empirical efficacy when developing behavioral interventions to be used in the public schools.

Another important consideration for teachers is the amount of time, personnel, and material resources required to implement a particular program (Darveaux, 1984; Witt, 1986; Witt & Elliott, 1982). As previously mentioned, school systems are currently facing severe financial cutbacks and teachers are hesitant to relinquish valuable resources (monetary or personnel) to implement a program whose cost outweighs its benefits. Teachers often have been presented school-based interventions which have disregarded the time and energy a teacher has to expend on a behavior management program when working alone with 20 - 30 students (Azrin, Azrin & Armstrong, 1977; Greenwood,
Hops & Walker, 1977; Greenwood, Hops, Walker, Guild, Stokes, Young, Keleman & Williardson, 1979; Mathews, McLaughlin & Hunsaker, 1980). In summarizing teacher attitudes towards school based interventions, many investigators conclude that an inverse relationship exists between the amount of teacher time required to administer an intervention and the degree to which teachers found that intervention suitable for use in the classroom (Martens, et al., 1985; Witt, Elliott & Martens, 1983; Witt, 1984; and Witt & Robbins, 1985). In other words, teachers preferred interventions which required less time. Therefore, researchers must develop behavioral interventions which are effective as well as time-efficient.

In addition to teachers' pragmatic considerations the literature also points to several theoretical factors which influence the use of an intervention. Woolfolk, Woolfolk, and Wilson (1977) found that users are often influenced by the theoretical foundations from which an intervention is derived and how that intervention is described during the consultation session. For example, Witt, et al. (1984) examined classroom teachers' perceptions of interventions as a function of the theoretical rationale and corresponding jargon used to describe the intervention. They found that when
"staying in at recess" was described and explained with a behavioral, humanistic or pragmatic rationale; the pragmatic rationale was preferred by classroom teachers.

A final factor which influences the use of an intervention is an ethical consideration (Crouch, Gresham & Wright, 1985; Martin, 1975). Teachers frequently have argued that too much special attention and programming is given to the inappropriate behavior of a few students; yet the appropriate behavior of other students often goes unnoticed and unrewarded. A major criticism of the Good Behavior Game (Barrish, Saunders & Wolf, 1969)—despite its proven effectiveness in managing talking and out-of-seat behavior—was its exclusive emphasis on negative and/or disruptive behavior (Darveaux, 1984). Since the development of the Good Behavior Game, teachers have continuously requested behavior management techniques that address the inappropriate behavior without completely disregarding the appropriate behavior of students.

Many researchers have attempted to address the many concerns of teachers regarding school-based interventions. In response to the predictions of child development researchers regarding children at
risk, and the concerns of teachers regarding many school-based behavioral interventions, group-oriented contingency systems have received widespread attention in psychological and educational journals. Relevant background information and the current status of group-oriented contingency systems are reviewed in the sections that follow.

**Group-Oriented Contingencies**

The use of group contingencies in the United States has its roots in the operant tradition (Skinner, 1953) and in the early work of O'Leary and Drabman (1971) investigating token economy systems. In an effort to control groups of individuals, token systems were devised (O'Leary & Drabman, 1971). Essentially, a token system exists when a specified behavior is reinforced using a clearly defined reinforcer with an understood value (e.g., green tokens worth five points), and back-up reinforcers that the tokens represent. Trained staff administer the system and carefully keep records on each participant. Although token systems were widely applied (particularly in classroom settings), they had a number of limitations (Hayes, 1976). Of primary concern, are the extensive and time consuming records that must be kept of each individual's behavior.
This drawback significantly minimizes their acceptance in many classroom settings. A second limitation was that different performance criteria for different individuals might foster competition, jealousy, and even the pilfering of tokens. In an effort to address the drawbacks of token systems, group reward systems were developed. The earliest studies were conducted in laboratory analogue situations (Azrin & Lindsley, 1956). These early researchers successfully taught cooperative behavior to children (seven to twelve years of age) through the use of learning principles. Since that time, group-oriented contingency systems have been studied extensively; and today they are one of the most researched, effective and widely applied behavioral interventions used in educational settings.

Types of Group-Oriented Contingencies. "Group rewards," "group contingencies" and "group-oriented contingencies" are terms which are generally used synonymously in the behavioral literature to refer to the application of operant techniques to the behavior management of groups of children and adults. However, these terms do not always refer to identical behavior management programs (Rosenbaum, O'Leary & Jacob, 1975). A "group contingency" typically
requires an entire group or class to achieve a certain level of performance in order for each member to receive the reinforcement (Rosenbaum, et al., 1975; Barrrish, et al., 1969; Graubard, 1969). "Group reward," on the other hand, involves reward for the entire group, but this reward may be based on the performance of one or two target children (Evans & Oswalt, 1968; Patterson, 1965; Rosenbaum, et al., 1975) or based on the performance of the entire group. Litow and Pumroy (1975) proposed that neither term accurately describes the application of operant techniques to group behavior management. These authors pointed out that it is not the group that performs, but rather the individuals within the group that perform. Consequently, they suggested that it would be more precise to describe these group behavioral management techniques in terms of "group-oriented contingencies." Accepting the terminology and rationale proposed by Litow and Pumroy (1975), and in an effort to impose consistent terminology on the group behavior management literature, operant techniques used to manage group behavior will hereafter be referred to as group-oriented contingency systems.

Expanding further on the nomenclature used to
describe group behavior management techniques, Litow and Pumroy (1975) have classified group-oriented contingency systems into three types: (a) interdependent, (b) dependent, and (c) independent. Each of these group-oriented contingency systems is discussed below.

Of the three types of group-oriented contingency systems, interdependent group-oriented contingency systems have been researched most extensively in the classroom (Crouch, et al., 1985; Gresham & Gresham, 1982; Litow & Pumroy, 1975; Speltz, Shimamura & McReynolds, 1982). An interdependent group-oriented contingency exists when the same response contingencies are simultaneously in effect for all group members, and group reinforcement is contingent upon a specific level of group performance (Litow & Pumroy, 1975). An example of an interdependent group-oriented contingency designed to improve academic performance would involve making free time for the class contingent upon all class members correctly solving 20 out of 30 assigned math problems. In this situation, each member's reinforcement depends on the level of group performance. Barrish, et al. (1969) were some of the first investigators to apply interdependent group-oriented contingencies in an effort to decrease out-of-seat and talking behavior in
a classroom setting using the Good Behavior Game. The interdependent group-oriented contingency system and the Good Behavior Game have been the focus of recent investigations (Crouch, et al., 1985; Darveaux, 1984; Gresham & Gresham, 1982; Speltz, et al., 1982. The results of these studies indicate that interdependent group-oriented contingency systems effectively reduce disruptive classroom behavior.

Of the three types of group-oriented contingency systems, the dependent group-oriented contingency system has received the least empirical evaluation (Gresham & Gresham, 1982; Litow & Pumroy, 1975). According to Litow and Pumroy (1975) a dependent group-oriented contingency is established when identical response contingencies are simultaneously in effect for all group members, but are applied only to the performances of one or more targeted group members. The consequences for the whole group are dependent upon the performance of the selected group members. In 1982, Gresham and Gresham reported that the amount of group behavior control exerted by dependent group-oriented contingency systems had not been empirically studied. Furthermore, few studies have compared dependent group-oriented contingency systems to the interdependent and independent group-oriented
contingency systems (Drabman, Spitalnik & Spitalnik, 1974; Gamble & Strain, 1979; Gresham & Gresham, 1982; Speltz, et al., 1982). The dependent group-oriented system has been used primarily in classroom settings to incorporate peer influence on interventions designed to decrease disruptive behavior and to increase academic performance (Evans & Oswalt, 1968; Gresham & Gresham, 1982; Patterson, 1965; Speltz, et al., 1982; Walker & Buckley, 1972). Despite the limited research on dependent group-oriented contingency systems, recent studies (Gresham & Gresham, 1982; Speltz, et al., 1982) have supported previous research that dependent group-oriented contingency systems are effective interventions for managing children's classroom behavior.

The third type of group-oriented contingency system is the independent-group oriented contingency system. This contingency system is said to be established when "the same response contingencies are simultaneously in effect for all group members, but are applied to performances on an individual basis" (Litow & Pumroy, 1975, p. 342). Under this contingency system, each member's outcome is not affected by the performance of others. Independent group-oriented contingency systems have been applied more frequently to special education classroom settings than to
regular education settings (Litow & Pumroy, 1975). Many researchers have successfully utilized independent group-oriented contingencies to improve academic behavior of targeted students (Hopkins, Schutte & Garton, 1971; Lovitt, Guppy & Blattner, 1969; Speltz, et al., 1982). Others have employed the Premack Principle of Reinforcement to improve desirable classroom behavior (Homme, deBaca, Devine, Steinhorst & Rickert, 1963; Wasik, 1970).

Based on the previously cited research, one could reasonably conclude that all three types of group-oriented contingency systems have demonstrated individual effectiveness in managing disruptive classroom behavior, social behavior and academic performance. This is an important fact when one considers the other factors which generally influence teachers' decisions to use a school-based intervention. The next section indicates that group-oriented contingencies have received favorable marks when compared with individual reward systems.

Advantages of Group Oriented Contingency Systems.

In view of the current financial difficulties that are facing the public schools, many researchers have suggested that it is impractical to implement behavior change techniques on an individual basis
(Bushell, Wrobel & Michaelis, 1968; Quay, Werry, McQueen & Spraque, 1966). Instead, Herman and Tramontana (1971) suggest that "it is much easier to dispense one reinforcer to the class than to dispense one to each class member" (p. 341). Consistent with these findings, one advantage of group-oriented contingencies that is repeatedly cited in the literature is that they require less teacher time for administration and record keeping (Crouch, et al., 1985; Gresham, 1983; Gresham & Gresham, 1982; Pigott, et al., 1985). Since the reinforcers remain constant for the entire class and are dispensed based upon independent, interdependent or dependent performance, teachers are not required to dispense individual reinforcers. Therefore, fewer adults are required to supervise and monitor the program (Gresham, 1983). Consequently, valuable human resources are not withdrawn and the instructional quality is not jeopardized.

Another pragmatic teacher consideration addressed by group-oriented contingency systems is the question of efficacy. Recent reviews (Hayes, 1976; Litow & Pumroy, 1975; O'Leary & O'Leary, 1976) have cited several studies which have empirically demonstrated that group-oriented contingency systems
are significantly more effective than individual reward systems. Of the studies cited, several possessed methodological errors which made precise comparisons impossible and occasionally rendered the results empirically meaningless (see for example, Hall, et al., 1971; Herman & Tramontana, 1971; Long & Williams, 1973; Shores & Norman, 1972; Walker & Buckley, 1972). In the Walker & Buckley study (1972), a reanalysis was conducted to better control the methodological flaws found in the previous study, and their subsequent results supported the superior effectiveness of group-oriented contingencies as compared to individual reward systems.

The only study that concluded that individual reward programs were more effective than group-oriented contingency programs was the Hall, et al. (1971) study which had several methodological problems. In this study, the reinforcement and feedback provided to subjects were significantly different, and may have biased the results in favor of the individual reward system. No other study was cited that concluded that individual reward systems were more effective than group-oriented contingencies. Three studies, however, did conclude that the two behavior management techniques were equally effective (Axelrod, 1973; Drabman, et al.,
1974 and Grandy, Madsen & DeMersseman, 1973). Each of these studies was conducted in a classroom setting and targeted disruptive classroom behavior.

A third advantage of group-oriented contingency systems is their ability to combine teacher administered contingencies with powerful peer contingencies (Crouch, et al., 1985; Litow & Pumroy, 1975; Pigott, et al., 1985; Pigott, Fantuzzo & Clement, 1986 and Rosenbaum, et al., 1975). The early work of Patterson (1965) proposed that peer groups could be used as a source of social reinforcements that undoubtedly would have some effect on the subject's behavior. Further investigations have suggested that group contingencies that foster interdependence have an added advantage of promoting cooperative behavior among students (McCarty, Griffin, Apolloni & Shores, 1977) and often remove the reinforcing social consequences that often maintain deviant behavior (Sulzbacher & Houser, 1968). Under this type of contingency plan, the disruptive student loses his/her cheering audience; and in its place he/she finds a peer group which expresses their disapproval of the deviant behavior. It has also been demonstrated that peer rewards and peer teaching were more effective than rewards and teaching delivered by authority figures (Minuchin, Chamberlain & Graubard,
1867; Wolfe, Fantuzzo & Wolter, 1984; Wolter, Pigott, Fantuzzo & Clement, 1984). Therefore, peer influence seems to augment the value of reinforcers earned from authority figures.

The final advantage of group-oriented contingencies circumvents the ethical complaints from teachers concerning the almost exclusive emphasis on negative or disruptive behaviors, while disregarding appropriate behaviors (Crouch, et al., 1985; Martin, 1975). With group oriented contingency systems, an entire group of individuals is reinforced for the behavior of various group members. Consequently, the same reinforcement is available and accessible to each student.

Having addressed many of the teachers' concerns, group-oriented contingency systems appear more acceptable in typical educational settings and their use in these settings is increasing. In an effort to fully delineate the current status of group-oriented contingency systems, the following sections review: 1) the relative effectiveness of each type of group-oriented contingency system; 2) applicability of group-oriented contingencies; and 3) collateral effects of group-oriented contingency systems.

Relative Effectiveness of Group-Oriented Contingency Systems. Most of the published research
relating to group-oriented contingencies has focused on individual applications of the various types of group-oriented contingencies with different populations in different settings (Hayes, 1976; Kazdin, 1980; Litow & Pumroy, 1975; O'Leary & O'Leary, 1976; Sultzer-Azaroff & Mayer, 1977). The body of literature in which interdependent, independent and dependent group-oriented contingencies are compared to one another is relatively small. Furthermore, some studies have actually compared the relative effectiveness of different types of group-oriented contingencies; yet have not specifically identified the behavioral interventions as such (Speltz, Moore & Mc Reynolds, 1979; Speltz, et al., 1982).

Consequently, one must draw on a small and frequently unclear body of literature to examine the relative effectiveness of interdependent, independent and dependent group-oriented contingencies.

Eighteen studies are cited in the literature which have compared the relative effectiveness of interdependent, independent and dependent group-oriented contingency systems in managing classroom behavior. However, four of the cited studies (Graubard, Lanier, Weisert & Miller, 1970; Hamblin, Hathaway & Wodarski, 1971; Jacobs, 1970; Levin, 1971) were unavailable (i.e., unpublished reports, limited circulation, etc.) for review. Therefore,
the results of these four studies will not be considered in the review that follows.

Most of the studies cited have compared the relative effectiveness of interdependent and independent group-oriented contingencies in managing classroom behaviors. As shown in Table 1, ten published studies have compared the relative effectiveness of interdependent and independent group-oriented contingency systems. Of those studies, five reported no significant differences in relative effectiveness between the two types of contingency systems (Axelrod, 1973; Grandy, et al., 1973; Herman & Tramontana, 1971; Prentice, 1970; Turknett, 1971). In general, these studies focused on reducing the level of disruptive behavior in classrooms. Four studies reported that the interdependent group-oriented contingency systems proved to be more effective than the independent group-oriented contingency system (Long & Williams, 1973; McNamara, 1971; Speltz, et al., 1979; Witte, 1971). Only one reported study (Ruppert, 1971) concluded that the independent group-oriented contingency system was more effective than the interdependent group-oriented contingency system.

When one examines the experimental designs employed, it is found that several of these studies
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<th>AUTHOR(S)</th>
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<th>TREATMENT CONDITIONS</th>
<th>TARGET BEHAVIORS</th>
<th>TREATMENT (NO. SESSIONS/DURATION)</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axelrod (1973)</td>
<td>Multiple Group Outcome (N = 31 subjects)</td>
<td>1. Interdependent Independent (each group was treated with each condition, order of treatment reversed)</td>
<td>Out-of-seat Disturbing others</td>
<td>3 weeks baseline, 2 weeks treatment (5 sessions/wk)</td>
<td>Both conditions equally effective in controlling talking &amp; out-of-seat behavior.</td>
</tr>
<tr>
<td>Grandy, Madsen &amp; de Mersseman (1973)</td>
<td>Single Group Outcome (Reversal &amp; Multiple Baseline) (N = 28 students)</td>
<td>Period I: 1. Independent 2. Interdependent Period II: 1. Interdependent</td>
<td>Talking Out-of-seat</td>
<td>Period I: 5 weeks baseline, 3 weeks treatment (5 sessions/wk) Period II: 7 weeks baseline, 1 week treatment (5 sessions/wk)</td>
<td>Both conditions equally effective in controlling talking &amp; out-of-seat behavior.</td>
</tr>
<tr>
<td>Herman &amp; Tramontana (1971)</td>
<td>Multiple Group Outcome (N = 6 subjects)</td>
<td>1. Interdependent 2. Independent</td>
<td>Disruptive behaviors</td>
<td>7 weeks baseline, 6 weeks treatment (5 sessions/wk) (27 sessions)</td>
<td>Both conditions equally effective in controlling talking &amp; out-of-seat behavior.</td>
</tr>
<tr>
<td>Long &amp; Williams (1973)</td>
<td>Single Group Outcome (Reversal &amp; Multiple Baseline) (N = 32 subjects)</td>
<td>Math &amp; Geography 1. Lessons 2. Interdependent 3. Independent 4. Points (Geography had an extended baseline)</td>
<td>Appropriate behavior Time off-task Disruptive behavior</td>
<td>Math Class 10 days baseline 60 days treatment Geography Class 18 days baseline 60 days treatment</td>
<td>6 of 8 math students &amp; 5 of 8 geography students performed better during the interdependent condition.</td>
</tr>
<tr>
<td>McNamara (1971)</td>
<td>Multiple Group Outcome (N = app. 30 students)</td>
<td>1. Instructions 2. Interdependent 3. Independent</td>
<td>Folder-getting</td>
<td>25 sessions baseline 22 sessions treatment</td>
<td>Interdependent contingencies more effective in controlling folder-getting behavior.</td>
</tr>
<tr>
<td>AUTHOR(S)</td>
<td>EXPERIMENTAL DESIGN</td>
<td>TREATMENT CONDITIONS</td>
<td>TARGET BEHAVIORS</td>
<td>SESSIONS/DURATION</td>
<td>RESULTS</td>
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</table>
| Prentice (1970) | Multiple Group Outcome (N = 6 classrooms) | 1. Interdependent  
(N = 6 classrooms)  
2. Independent  
(conditions reversed) | Attentive behaviors | 3 weeks baseline, 2 weeks treatment | No significant differences in effectiveness of conditions in shaping attentive behaviors |
| Ruppert (1971) | Multiple Group Outcome (N = 2 classes) | 1. Independent  
2. Interdependent  
(conditions reversed) | Appropriate social behaviors | 4 months | Independent condition significantly increased the rate of appropriate social behavior in both classes. |
| Speltz, Moore & McReynolds (1979) | Controlled Group Outcome (N = 54 students) | 1. Request only  
2. Free reward  
3. Independent  
4. Interdependent  
5. Interdependent (all member) | Submission of multiple choice questions | 2.5 weeks baseline (5 sessions)  
3.5 weeks treatment (7 sessions) | Interdependent condition resulted in significantly higher rates of question submission. |
| Turknett (1971) | Multiple Group Outcome (N = 12 classes) | 1. Independent  
2. Interdependent  
(conditions reversed) | Creative productions | No baseline reported | Both conditions equally effective in controlling creative student productions. |
| Witte (1971) | Multiple Group Outcome Class I: (N = 2 classes)  
Class II: (N = 2 classes) | 1. Independent  
2. Interdependent  
3. Interdependent | Peer tutoring  
Social interactions  
Interracial accept. | No baseline reported | Interdependent conditions resulted in increased interracial peer tutoring, social interactions and interracial acceptance. |
(e.g., Grandy, et al., 1973; Herman & Tramontana, 1971; Long & Williams, 1973) contained methodological deficiencies which weakened their findings. For example, Long and Williams (1973) employed very different procedures under the interdependent and independent group-oriented contingency conditions and the quality of the reinforcers varied significantly. Therefore, precise comparisons regarding the relative effectiveness of each procedure were not possible. Similar methodological deficiencies existed in the Herman and Tramontana (1971) study. They achieved a "floor effect", as inappropriate behavior dropped to near zero levels following the behavioral intervention. Since nonstatistical data analyses were conducted, this general absence of inappropriate behavior precluded a more powerful examination of the relative effectiveness of individual and group reinforcement. Furthermore, a significant weakness existed in the experimental design of the Grandy, et al. (1973) study in that the individual contingency preceded the group contingency with the same subjects. This ordering of treatments may have unfairly contributed to the effectiveness of the group contingency. If the two contingencies had been applied in different sequences, the results may have been very different. If these three studies are
excluded from the current literature review (on the basis of methodological flaws), one finds that the interdependent group-oriented contingency system has proven equal to or more effective than the independent group-oriented contingency system in six of the seven studies reviewed. Three of the studies reviewed concluded that both contingency systems were equally effective and three studies concluded that the interdependent group-oriented contingency system was more effective than the independent group-oriented contingency system.

Two studies have compared the relative effectiveness of dependent group-oriented contingency systems to either interdependent or independent group-oriented contingency systems. As shown in Table 2, Drabman, et al. (1974) compared independent and dependent group-oriented contingency systems and concluded that both contingency systems were equally effective in producing behavior change. Several years later, Gamble and Strain (1979) compared interdependent and dependent group-oriented contingencies in managing the social behavior of approximately fifteen emotionally handicapped elementary students. Gamble and Strain concluded that both interdependent and dependent group-oriented contingencies were effective, with interdependent contingencies producing a slightly
| STUDIES COMPARING DEPENDENT GROUP-ORIENTED CONTINGENCIES TO INTERDEPENDENT OR INDEPENDENT GROUP-ORIENTED CONTINGENCIES IN CONTROLLING CLASSROOM BEHAVIOR |

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<th>TREATMENT (NO. SESSIONS/DURATION)</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drabman, Spitalnik &amp; Spitalnik (1974)</td>
<td>Multiple Group Outcome 1. Independent (4 x 4 Latin Square) (N = 23 subjects) 2. Dependent (Most) 3. Dependent (Least) 4. Dependent (Random) (each condition was rotated every 2 weeks)</td>
<td>Disruptive behavior</td>
<td>2 weeks baseline, 8 weeks treatment</td>
<td>All conditions were equally effective in producing behavior change.</td>
<td></td>
</tr>
<tr>
<td>Gamble &amp; Strain (1979)</td>
<td>Multiple Group Outcome 1. Interdependent (N = 15 subjects) 2. Dependent (each group treated with each condition, order of treatment reversed)</td>
<td>Socially appropriate behavior</td>
<td>Class I: 17 days baseline, 23 days treatment, Class II: 19 days baseline, 23 days treatment</td>
<td>Interdependent condition produced higher rates of appropriate social behavior.</td>
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</table>
higher rate of appropriate social behavior.

Finally, two studies (Gresham & Gresham, 1982; Speltz, et al., 1982) have simultaneously compared all three types of contingency systems. As can be seen in Table 3, Speltz, et al. (1982) conducted a study in which four contingency systems were compared. Although these authors did not specifically identify the experimental conditions using the same nomenclature that Litow and Pumroy (1975) offered, the reinforcement contingencies of the four experimental groups corresponded to the interdependent, independent and dependent group-oriented contingency systems. Two variations of the dependent group-oriented contingency system were used. In one condition, group reinforcement was based on the number of problems correctly completed by an identified low-performing student. In the other dependent condition, group reinforcement was determined by the performance of an unidentified, randomly selected student. The results of this study suggest that all four conditions were equally effective and led to improved academic performance. Differences among the contingencies were most evident in social interactions with the dependent group-oriented contingencies producing significantly more frequent
<table>
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</tr>
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<tbody>
<tr>
<td>Gresham &amp; Gresham (1982)</td>
<td>Single Group Outcome (N = 12 subjects)</td>
<td>1. Interdependent 2. Independent 3. Dependent</td>
<td>Disruptive behavior</td>
<td>10 days baseline 30 days treatment</td>
<td>Disruptive behavior was lowest under interdependent condition.</td>
</tr>
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</table>
positive social interactions than had been observed during baseline.

Another recent study which compared the effectiveness of interdependent, dependent and independent group-oriented contingency systems was conducted by Gresham and Gresham (1982). These researchers examined the relative effectiveness of the three contingency systems in controlling disruptive classroom behaviors. The subjects were educably mentally retarded children in a self-contained classroom. Using a variation of a reversal design, these authors found that interdependent and dependent group-oriented contingencies resulted in lower levels of disruptive behavior than did the independent group-oriented contingency. In fact, the rates of disruptive behavior under the independent condition were not greatly different from those observed during baseline phases. Although the interdependent contingency resulted in the lowest levels of disruptive behavior, Gresham and Gresham reported that the experimental design employed in their study did "not necessarily demonstrate the superiority of the interdependent contingency system in controlling disruptive behavior" (p. 108). Since treatments were sequentially ordered, one could not rule out cumulative carry-over effects as an influence in
reducing the disruptive behavior of the group.

When the results of these fourteen studies are summarized, one finds that seven studies concluded that the three types of group-oriented contingencies are equally effective; six concluded that the interdependent contingency system was most effective and one study concluded that the independent contingency system was more effective than the interdependent group-oriented contingency system.

Two conclusions are readily apparent from the results of these fourteen studies. First, both the interdependent and independent group-oriented contingency systems have demonstrated their relative effectiveness when compared to each other and when compared to the dependent group-oriented contingency system. Secondly, as previously mentioned and further documented in Tables 1, 2 and 3, the dependent group-oriented contingency system has received the least empirical examination and its relative efficacy has not been adequately demonstrated. However, as previously reviewed, group reward systems possess several cited advantages over individual reward systems which increase their acceptability in educational settings. Therefore, despite their relatively equal footing in terms of efficacy, the interdependent group-oriented contingency system addresses more identified teacher...
concerns. Consequently, the likelihood of an interdependent group-oriented contingency system being accepted by teachers and implemented in a typical classroom is greater than an independent group-oriented contingency system.

In recent years, the body of literature examining group-oriented contingency systems has changed significantly. Recent literature has focused on the social validity of group-oriented contingencies (Elliott, 1986; Elliott, et al., 1984; Witt, 1986); collateral effects of group-oriented contingencies on social behavior (Speltz, et al., 1982); modifications to previously used methods in an effort to enhance their effectiveness and acceptability in educational settings (Crouch, et al., 1985; Darveaux, 1984); and the effectiveness of combining different types of group-oriented contingencies (Crouch, et al., 1985).

One factor which directly bears on the results of the previously cited outcome research is the fact that group-oriented contingency systems have been widely applied across many divergent settings and populations. The next section addresses the many applications of group-oriented contingency systems.

**Applicability of Group-Oriented Contingency Systems.** Although the majority of group-oriented
contingency studies reviewed involved elementary school age children of normal intelligence (Barrish, et al., 1969; Crouch, et al., 1985; Drabman, et al., 1974; Greenberg & O'Donnell, 1972; Patterson, 1965; Pigott, et al., 1985; Pigott, et al., 1986; Walker & Buckley, 1972; Wilson & Williams, 1973), a variety of subjects have been exposed to group-oriented contingencies. In addition to elementary school-age children, other researchers have employed preschoolers (Herman & Tramontana, 1971), junior high school students (Long & Williams, 1973; Page & Edwards, 1978; Wilson & Hopkins 1973), and college students (Speltz, et al., 1979). Additionally, subjects of less than average intelligence and/or students with learning or behavioral difficulties have also been the subject of many group-oriented contingency studies (Axelrod, 1973; Darveaux, 1984; Gamble & Strain, 1979; Greene & Pratt, 1972; Gresham, 1983; Gresham & Gresham, 1982; Long & Williams, 1973; Nelson, Worell & Polsgrove, 1973; Ritschl, et al., 1972; Shores & Norman, 1972; Speltz, et al., 1982; Sulzbacher & Houser, 1968). Several studies have gone outside the educational environment to examine the effectiveness of group-oriented contingency systems with special child and adult populations. Graubard (1969) employed group-oriented contingencies on subjects who were residents in a treatment
center for emotionally disturbed individuals while Liebson, Cohen & Faillace (1972) used group-oriented contingencies in their work with adult alcoholics. Thus, although the majority of group-oriented contingency systems research has been confined to normal, preadolescent school children, group contingencies seem equally feasible for a divergent group of subjects in settings outside the educational environment.

Consistent with the large number of subject populations and settings, one finds an equally large, and diverse number of reinforcers that have been used in the contingency systems. Some studies utilized reinforcers that were intrinsic to the classroom setting. These reinforcers included free time (Barrish, et al., 1969; Crouch, et al., 1985; Drabman, et al., 1974; Grandy, et al., 1973; Long & Williams, 1973; McLaughlin, 1981; Wilson & Williams, 1973), story time (Darveaux, 1984; Evans & Oswalt, 1968), early dismissal (Evans & Oswalt, 1968), and teacher praise (Greenberg & O'Donnell, 1972). Occasionally, edibles were used as reinforcers in the form of an ice-cream party (Carlson, Arnold, Becker, & Madsen, 1968) or candy and snacks (Azrin & Lindsley, 1956; Darveaux, 1984; Gamble & Strain, 1979; Graubard, 1969; Greenberg & O'Donnell, 1972; Gresham, 1983;
Patterson, 1965; Rosenbaum, et al., 1975). In one study reviewed, money was used as the reinforcer to manage the drinking behavior of adult alcoholics (Liebson, et al., 1972). In this study, subjects were fined $10.00 for alcoholic offenses. In a more individualized manner, Nelson, et al. (1973) awarded individually tailored reinforcers, such as extra time in the shower or swings on a grapevine, to children at camp. This approach parallels the recent work of Pigott, et al. (1985) and Pigott, et al. (1986) where the group members were able to determine which back-up reinforcers would be used. In addition to the demonstrated efficacy and divergent applicability, a few studies regarding group-oriented contingency systems have investigated the effects of group-oriented contingency systems on collateral behaviors. A final section reviews the research concerning collateral effects of group-oriented contingency systems.

Collateral Effects of Group-Oriented Contingency Systems. The effects of group-oriented contingency systems on collateral behaviors are especially interesting, but not well established (Hayes, 1976; Speltz, et al., 1982). A review of the psychoeducational literature indicates that classroom behavior, academic performance, sociometric status, social interactions, and peer tutoring have been examined as collateral behaviors affected by individual and
group-oriented contingency programs. Most of the research attention has been focused on classroom behaviors (on-task, off-task, disruptive) and their influence (positive and negative) on academic performance. Consequently, many of the formal studies have assessed the collateral effects on academic performance of individual and group-oriented contingencies designed to attenuate disruptive behavior or to improve on-task behavior (Ayllon, Layman, & Burke, 1972; Ayllon, Layman & Kandel, 1975; Ayllon & Roberts, 1974; Cobb, 1972; Cobb & Hops, 1973; Hall, Lund & Jackson, 1968; Hay, Hay & Nelson, 1977; Kirby & Shields, 1972; Madsen, Becker & Thomas, 1968, O'Leary, Becker, Evans & Saudargas, 1969; Winett & Roach, 1973; Winett & Winkler, 1972). Despite the earlier assumption that off-task behavior interferes with classroom learning and that its elimination will necessarily improve academic performance (Hall, et. al., 1968; Madsen, et al, 1968; O'Leary, et al., 1969), subsequent research indicated that it was more parsimonious to directly modify academic performance. Hay, et al. (1977) specifically concluded that "intervention procedures aimed at the direct modification of academic performance produced not only substantial improvements in accuracy and rate of academic performance, but also enhanced on-task classroom
behavior" (p. 437). This line of reasoning has the advantage of addressing one teacher concern about the exclusive emphasis on negative behavior. One could conclude, therefore, that teachers would show a preference for intervention procedures of this sort. In addition to the demonstrated utility of individual and group-oriented contingencies in controlling disruptive and academic behavior, a variety of beneficial social effects have been reported to accompany the management of classroom behavior and academic performance.

Unlike the literature regarding academic collateral behaviors, sociometric status and social interactions have generally been informally examined with anecdotal reports of interesting or unusual instances of social responses (e.g., see Alexander, Corbett & Smigel, 1976; Carlson, et al., 1968; Evans & Oswalt, 1968; Greenberg & O'Donnell, 1972; Packard, 1970; Schmidt & Ulrich, 1969; Speltz, et al., 1979; Wilson & Williams, 1973). These authors have reported collateral changes in sociometric and/or peer social functioning even when those behaviors were not the identified target behaviors. However, there are few studies which have directly examined sociometric status and social interactions as collateral behaviors to group-oriented contingencies. In 1970, Alden, Pettigrew,
and Skiba compared changes in popularity as a function of three experimental conditions. They found that individuals who earned a group reward showed a significant increase in sociometric status. In addition to examining the results of group-oriented contingencies on disruptive behavior for a class of first graders, Drabman, et al. (1974) also obtained measures of friendship patterns and peer ratings of responsibility. They found that disruptive subjects were rated as more responsible when they were the target subjects. Friendship selections, however, remained unchanged despite the increase responsibility ratings. Despite the favorable results of this study, group-oriented contingencies have not consistently resulted in improved social status for target subjects. For example, Hayes (1976) reported that sociometric status decreased for low-status target subjects under some experimental conditions, yet increased under other experimental conditions. These results point to a need for more research on changes in sociometric status as a function of group-oriented contingency systems.

Speltz, et al. (1982) directly examined patterns of social interactions in connection with contingency systems designed to improve the academic functioning of four learning disabled students. Unlike some investigators who have noted the potential of group contingencies to encourage negative peer interactions
(Gresham, 1983; Hayes, 1976; McLaughlin, 1974; O'Leary & Drabman, 1971; Pigott, et al., 1985), the social interaction data of the Speltz study did not support these concerns. On the contrary, peer interactions that were coded "negative" were generally quite low and not one instance of negative behavior was directed at the targeted children during the dependent group-oriented contingency when there would appear to be much social pressure on these students. Furthermore, several observed helping behaviors were recorded when helping behavior was allowed to occur without restriction. The helping behaviors identified included: task structuring, exchanging worksheets, checking peer's answers, giving answers verbally to peers and direct instruction or tutoring. Although the Speltz study directly addressed the effects of group-oriented contingencies on social interactions, the formal research in this area is limited and more systematic measurement is required.

The Present Study

Although the psychoeducational literature regarding group-oriented contingencies is extensive and spans over 20 years, some unanswered questions remain. To begin with, the number of controlled group outcome studies examining the efficacy of the various types of group-oriented contingency systems
is very limited. Furthermore, recent studies that examined the effectiveness of interdependent group-oriented contingency systems have not been adequately replicated. Therefore, an obvious question is whether or not these results can be replicated in other educational settings.

Another question comes to mind when one considers the aims of many behavioral interventions. In addition to decreasing inappropriate classroom behavior, an equally important aim of many behavioral interventions is to replace the inappropriate behavior with appropriate classroom behaviors which are also more conducive to learning. As the literature suggests, the strict elimination of disruptive behavior is not sufficient for learning to occur. Students must also acquire various on-task attending skills in order to complete the learning process. Consequently, one would wonder whether behavioral interventions which focus primarily on reducing inappropriate classroom behavior, affect appropriate/on task behavior differently than those that focus primarily on increasing appropriate classroom behavior. As the literature indicates, the targeted on-task/appropriate behaviors could be manipulated using direct or indirect behavioral interventions.
Finally, accepting the notion that specific behaviors do change collaterally with behaviors which are directly treated, a logical question that follows is: Which behaviors (classroom, academic, social, etc.) are amenable to this indirect manipulation using group-oriented contingency systems. The present study addressed these questions.

In view of the literature which outlined the status of group-oriented contingency systems in public schools and the abovementioned questions which require further research, the present study had two major purposes: 1) to compare the relative effectiveness of two interdependent group-oriented contingency systems (one designed to increase academic performance and one designed to decrease poor academic performance) and a control group; and 2) to determine the effects of each of the contingency systems on specific collateral behaviors (i.e., classroom behavior, social interactions and peer sociometric ratings).

With these purposes in mind, it was hypothesized that 1) both group-oriented contingency systems would more effectively control academic performance than no treatment; and 2) that the positive interdependent group-oriented contingency system would systematically increase on-task classroom behavior, as well as improve
peer social interactions and peer sociometric ratings better than the negative interdependent group-oriented contingency system or the control group.
METHOD

Experimental Design

The design of this study was a 3(Group) X 3 (Phase) factorial experiment with one between group factor and one repeated measure. As can be seen by Figure 1, the between group factor had three levels (positive group-oriented contingencies, negative group-oriented contingencies and no group-oriented contingencies). The repeated measure was phase and the three levels of equal length (two weeks), were baseline, Phase-1 and Phase-2. Six classes were randomly assigned (two classes per treatment condition) to the three experimental conditions. For purposes of this study, classrooms under the same experimental condition were treated as a single group.

Subjects

Sixty fourth grade students and sixty-six fifth grade students from six science classes in Tomball Independent School District were randomly assigned (two classrooms each) to the three treatment conditions. Each treatment condition contained one fourth grade class and one fifth grade class. The mean
Figure 1. Experimental design showing the two factors and the levels of each factor.
age for the students was 9.94 years. Of the 126 students, 118 were white (93.7%), 5 were hispanic (4.0%), and 3 were asian (2.4%). Sixty-six of the students were male (52.4%) and 60 of the students were female (47.6%). All subjects were volunteers through their teachers' agreement to participate and parental approval (See Appendix G).

Experimental Setting

The positive and negative interdependent group-oriented contingency systems were administered in the regular classroom, as was measurement of the dependent variables. Teachers of the treatment groups were requested to modify their classrooms to accommodate the experimental requirements. For example, each student wore identifying numbers on his or her shirt, reinforcement contingencies were established, reinforcers were delivered based on group performance, and parent observers entered classrooms weekly. Control group teachers were required to make similar modifications with the exception of establishing reinforcement contingencies.

Dependent Variables

Academic Performance. Academic performance was directly targeted for change, using the positive and negative interdependent group-oriented
contingency systems. Grades on daily classroom worksheets were used to assess the academic performance of each student. Daily worksheets were developed, administered and scored by each classroom teacher. Students were required to produce written answers on the daily worksheets. These worksheets consisted of standard fourth and fifth (Loren, McCarty, O'Gara, McMasters, Halpern and Masonis, 1985) grade science assignments, usually one to two pages in length, involving various scientific tasks. Throughout the study, including the baseline period, the teachers, using their professional experience, determined that each assignment was qualitatively and quantitatively appropriate for the students to complete each day. All assignments were given a difficulty rating by the teacher who administered those assignments. Assignments were rated "new" material, "reviewed" material or "old" material based on operational definitions (see Appendix A). These difficulty ratings were used to address the issue of assignment difficulty and its potential influence on academic performance. Teachers were instructed to keep the time required for completion of assignments to between fifteen and twenty minutes. Student papers were scored by each teacher according to the answer book.
Classroom Behavior. Classroom behavior was the first collateral behavior examined. The principal investigator conducted a preliminary observation to determine the types of behavior exhibited by the children in each classroom and to reduce later reactivity to observation. Classroom behaviors were categorized using a well accepted classification system which has been used successfully in the behavioral literature (Crouch, et al., 1985; Fishbein & Wasik, 1981; Long & Williams, 1973). Each behavior was classified as "on-task," "off-task," or "disruptive" behavior. The specific behaviors within each category varied as a function of the classroom task. "On-task" behavior was defined as a child's actions or orientations indicating appropriate engagement in assigned tasks (Williamson, Calpin, DiLorenzo, Garris & Petti, 1981). Examples included:

1. looking at books or other materials;
2. turning to appropriate page or assignment;
3. writing answers to questions; and
4. shifting to appropriate activities according to classroom rules.

"Off-task" behavior was defined as a child's action or disorientation indicating inappropriate engagement in unassigned tasks. Examples included:
1. looking around the room or out of the window; 
2. failure to turn to the appropriate page or assignment; 
3. drawing pictures or scribbling on paper; and 
4. failure to shift to appropriate activities according to classroom rules.

"Disruptive behavior" extended the definition of "off-task" behavior and included behaviors which interfered with, disturbed and/or broke the teacher's and/or students' performance of their classroom assignments/duties. Examples included:

1. calling out in class; 
2. making noises with body parts or classroom materials; 
3. talking to another student without teacher permission; 
4. physical or verbal aggressiveness; and 
5. destruction of personal or school property.

Classroom behaviors were measured using a Behavior Rating Form (see Appendix C) designed specifically for this study. Classroom observations were made in each classroom on Wednesday afternoons during the science period between 1:00 - 2:00 p.m. Trained raters were used to collect this information through classroom observations. These observations were conducted weekly throughout the duration of the study. However, the two weekly scores for each phase were averaged to provide three mean phase measures of classroom behavior. Parent volunteers served as primary observers of student behavior and the
author served as a secondary observer to check rater reliability. During the recording periods, the observer sat in the front of the classroom. Recording intervals were signalled as the observer listened to audiotaped instructions through earphones. Approximately every three minutes the rater(s) scanned the room (beginning either on the left or right side of the room depending on audiotaped instructions) and placed a "D" (indicating that the student was exhibiting disruptive behavior), an "O" (indicating that the student was exhibiting off-task behavior), or a "T" (indicating that the student was exhibiting on-task behavior) beneath the column that corresponded to the student(s) who was/were exhibiting off-task, disruptive or on-task classroom behavior. Classroom behaviors were recorded on the same form as the social interaction observations. Behavior recordings were made on the odd numbered time intervals beginning with interval number one. The recording procedure employed was a combination of momentary time sampling with a PLA-Check recording procedure (Risley & Cataldo, 1976). Momentary time sampling data agree closely with continuous data with intervals up to 240 seconds (Powell, Martindale & Kulp, 1975). Reliability observations were made
twice for each observer during the course of the study. Each student received individual on-task, off-task and disruptive classroom behavior scores based upon his or her performance during each observation period. Interobserver agreement was calculated by the following formula:

\[
\frac{A}{A+D} \times 100
\]

where \( A \) is the number of intervals in which exact agreement on the number and type of behavior occurred and \( D \) is the number of intervals in which disagreement occurred.

**Sociometric Status: Rating-Scale Measure.**

A sociometric measure of peer acceptance was utilized to assess the extent to which the positive and negative interdependent group-oriented contingency systems affected the sociometric status of all students. Peer acceptance was determined using a rating-scale measure (see Appendix D). Students were provided a list of all same-sex classmates and asked to rate every student according to how much they liked to play with each student. Scores could range from 1 (dislike playing with very much) to 5 (like playing with very much). A student's
acceptance score was the average rating received from his/her classmates. Since elementary school children exhibit a strong bias against opposite-sex peers on sociometric measures (Asher & Hymel, 1981; Criswell, 1939; Singleton & Asher, 1979), same-sex peers were asked to rate each other. Students' acceptance scores were targeted as collateral dependent variables and systematically examined throughout the study. Total confidentiality was insured and student responses were not disclosed. Sociometric measures were taken once during the last few days of each phase of the study.

Social Interactions. The final collateral behavior to be systematically analyzed was patterns of social interactions that occurred among the students. Trained raters observed, categorized and recorded interactive behavior among the students as "positive," "neutral," or "negative." The definitions for these categories (taken directly from Frankosky & Sulzer-Azaroff, 1978) are described in Appendix E. Observations were recorded every three minutes using the scanning procedure and the Behavior Rating Form (see Appendix C) previously described. Social interaction behaviors were recorded on the even numbered intervals of the Behavior Rating Form, beginning with interval number two. Classroom
behavior and social interactions were observed and recorded on the same days and at the same time, using the Behavior Rating Form. These weekly scores were converted into three mean phase measures for purposes of data analysis. Interrater reliability was calculated using the previously described formula.

Procedure

Preliminary Survey. During the first week of baseline, a preliminary survey was conducted to determine socially valid positive reinforcers which were used with elementary school age children. This survey is described briefly.

The "Student Survey" (see Appendix F) consisted of Likert-like questions asking students to rate various positive reinforcers from "least" liked to "most" liked on a scale from 1 - 5. The four reinforcers which received the highest ratings were randomly assigned as the respective reinforcer for each of the four weeks of treatment.

Rater Training. Parent volunteers were trained to conduct the classroom behavior and social interaction ratings over a five day period, thirty minutes per day. Parent volunteers were parents whose children attended elementary school in the targeted school district. These parents also did volunteer
work in district schools to assist classroom teachers in various noninstructional capacities. They were trained to make classroom observation using the Behavior Rating Form and the behavioral definitions (see Appendices B and E). Written examples of each behavioral definition were provided. Additionally, each rater received a list of classroom rules which applied to all classrooms and further governed their scoring of the observed classroom behaviors. After three review days, the raters rehearsed the observation and recording procedures with live models. These models were volunteer students who were not participants in the study. Interrater reliability checks were conducted in conjunction with rater training, and once 80% agreement among the raters was obtained, the raters were allowed to participate in the study. As previously mentioned, interrater reliability checks were also conducted at specific points throughout the course of the study.

Teacher Training. Teacher training consisted of a set of written instructions (explaining the interdependent group-oriented contingency program), one forty-five minute question and answer period to discuss the contingency plan format, and one forty-five minute classroom observation (with a 15 minute
verbal follow-up) to determine the teacher's ability to implement the contingency program. Thereafter, teacher compliance was monitored in conjunction with the in-class observations. Weekly supervision sessions were conducted between teachers and the primary investigator to address their individual concerns, difficulties, etc. associated with implementing the contingency program.

Experimental Phases. The Baseline phase was conducted for ten days and the typical (baseline) rates of academic performance, classroom behavior, sociometric status of all students, and social interaction patterns were obtained, measured and recorded. Trained raters conducted the behavioral observations (i.e. classroom behavior and social interaction patterns) and the principal investigator administered the sociometric measures of peer acceptance. Observations of classroom behavior and social interactions were conducted weekly on Wednesday afternoons in the fourth and fifth grade science classes. The sociometric ratings were administered on the tenth day of the baseline phase. Academic performance was assessed via daily worksheets administered to each student and scored by the classroom teacher. To reduce the number
of academic scores which were systematically analyzed, each student's daily worksheet scores were converted into average weekly scores by dividing the total score of all daily worksheets by the number of worksheets administered. These weekly scores were converted into three mean phase measures of academic performance.

During Phase-1 (which spanned two weeks), the positive and negative interdependent group-oriented contingencies were introduced to the respective classrooms. Under the positive interdependent group-oriented contingency system, the entire class was reinforced if the class average on the daily assignment was at least 90%. The nature of the reinforcement was decided prior to the initiation of treatment based on student responses to the Student Survey. Each student voted on several reinforcers and the four reinforcers which received the highest ratings were used (one per week) during Phases 1 and 2. Under the negative interdependent group-oriented contingency system, the entire class was reinforced if the class average on the daily assignment did no fall below 90%. These conditions also continued through Phases 1 and 2. As previously mentioned, daily worksheet scores were converted into two mean phase measures (one for each
phase of treatment.

**Introduction of Procedure to Students.**

Immediately after the Baseline phase ended, the following instructions were read to the positive g-o-c classrooms:

"My name is Mrs. Lethermon and I would like your class to play a game with me for the next four weeks during Mrs. ________'s class. The name of the game is the 'As are Awesome' game. Each day your class will be graded on how accurately you complete your daily assignment sheets. If your class earns an average grade of 90% or better on the daily assignment sheets, your entire class will receive one of the rewards listed on the reinforcement menu that you completed. A new reward will be available each week, but it will be up to each one of you to earn it. If your class does not earn an average grade of 90% or better on any given day, then you will not be able to earn the reward for that day. Only those assignments turned in at the end of the period and with at least one-half of the problems completed, will be included in the class average. Those papers turned in late, or without one-half of the problems completed, will be scored zero and averaged in as a zero. Good Luck."

The same instructions were read to the negative g-o-c classrooms with the following word changes:

"The name of the game is the 'Bs are for Bumbs' game. Each day your class will be graded on how accurately you complete your daily assignment sheets. If your class average on the daily assignment sheets does not fall below 90%, then your entire class will receive one of the rewards listed on the reinforcement menu that you completed a few days ago. A new reward will be available each week, but it will be up to each one of you to work together to earn them. If the class average falls below 90%, then your class will not be
able to earn the reward that day. Good Luck."

When the treatment phases ended, the group-oriented contingency system ended and the teachers conducted their classroom activities as usual.

Post-treatment Surveys. At the completion of the study, acceptance ratings were administered to the students and their teachers to determine their perceptions of the acceptability of the classroom interventions. The Intervention Rating Profile-15 (IRP-15) (Witt & Martens, 1983) (see Appendix H), a modified version of the Intervention Rating Profile (Witt & Martens 1983), was administered to each teacher. This version contains 15 items which assess the teacher's satisfaction with the group-oriented contingency system administered in their class. Teachers were asked to express their evaluation of the intervention concerning factors such as whether the intervention would be recommended to other teachers; whether the intervention would be appropriate for other children with similar academic problems; whether it was unfair or cruel, etc. Each student participating in the study was administered a modified version of the Children's Intervention Rating Profile (CIRP) (Elliott, Witt, & Galvin, 1983) (see Appendix I), to assess their perceptions of the acceptability of the intervention used in their classroom.
Again, the questions of fairness, appropriateness for other children, and side-effects associated with this intervention were addressed through this survey.
RESULTS

Preliminary Survey

The four reinforcers that were used to establish the reinforcement contingency during the four weeks of treatment were: extra computer time, extra story time, talking with classmates and popping corn. These reinforcers were rated highest by the students receiving mean rating scores of 4.8, 4.6, 4.6, and 4.5 respectively on a 5.0 rating scale. The order in which the reinforcers were presented to the classes was randomly assigned, and each treatment group had access to the same reinforcer each week.

Interrater Reliability

Interrater reliability among the seven parent volunteers was calculated prior to the beginning of the study to insure that the observation procedure was conducted consistently and reliably among the raters. Following the rater training sessions, interrater reliability was calculated on several practice observations until the raters achieved 80% agreement on two consecutive trials. This criterion was reached after five trials and the interrater reliability
scores for the last trial are presented in Table 4. Reflected in the table are all pairwise interrater reliability comparisons for classroom behavior and social interactions for each of the ten subjects observed during the training trials. Interrater agreement ranged from 70 - 100%, with 89.3 mean percentage agreement among all raters, across all subjects.

During the course of the study, the principal investigator conducted reliability checks on two of the six classroom observations made by each rater. Reliability checks were scheduled randomly throughout the study. The results of the first and second reliability checks for each rater are presented in Table 5. These results present the percentage agreement between the principal investigator and each rater for the ten students observed during each reliability check. Percentage agreement between each rater and the principal investigator for individual subjects ranged from 75 - 100%. The mean percentage agreement scores were 92.0 and 92.25, respectively, for the first and second reliability checks.

Pretreatment Analyses

Achievement Test Scores. Mean achievement test
### TABLE 4

**INTERRATER RELIABILITY**

(Percentage Scores)

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<th>SUBJECTS</th>
<th>MEANS</th>
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</thead>
<tbody>
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<tr>
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</tr>
<tr>
<td>1 &amp; 3</td>
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<td><strong>OVERALL MEANS</strong></td>
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### TABLE 5
**First and Second Reliability Checks**
**Between the Primary Investigator and Each Rater**
(Percentage Scores)

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<th>MEANS</th>
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<tr>
<td>PI &amp; 6</td>
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**Overall Means (Reliability Check #1)**

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<tr>
<td>PI &amp; 2</td>
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<td>PI &amp; 3</td>
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<td>PI &amp; 4</td>
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</tr>
<tr>
<td>PI &amp; 6</td>
<td>100 100 100 95 100 100 95 100 90 100</td>
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**Overall Means (Reliability Check #2)**

<table>
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<tbody>
<tr>
<td>92.0</td>
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<tr>
<td>92.25</td>
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</tbody>
</table>
scores for each experimental group were analyzed using a one-way analysis of variance (ANOVA). Individual achievement was measured by the sixth edition of the Metropolitan Achievement Tests (MAT-6) which was administered to the students at the end of the previous school year. The "Total Complete Battery" score was used as an overall achievement index for purposes of pretreatment group comparisons. The mean for this test is 100 and the standard deviation is 15. The results of the one-way ANOVA computed for the MAT-6 showed significant pretreatment differences between experimental conditions, $F(2,105) = 6.16$, $p < .003$. Figure 2 reflects the MAT-6 scores for each experimental condition. As can be seen by Figure 2, the mean scores for the control group, positive g-o-c and negative g-o-c were 110.94, 112.88 and 121.32 respectively. Post hoc comparisons of group means using the Tukey Honestly Significant Difference (hsd) statistic indicated that the mean MAT-6 score for the negative g-o-c group was higher than those for the control group and the positive g-o-c group. It should be noted that the negative g-o-c group obtained a mean achievement test score approximately one and one half standard deviations above the
Figure 2. MAT-6 Scores and Six-Week Science Grades for Each Experimental Condition

MAT-6 SCORES

SIX-WEEK SCIENCE GRADES
national norm. This difference in achievement could affect academic performance, and thus could affect generalizability and interpretation of the results. For this reason, achievement test score was used as a covariate in other analyses where achievement might affect the results.

Science Grades. A one-way ANOVA was also computed to analyze pretreatment 6-week science grades for each treatment condition. The results of this analysis approached significance, $F(2,123) = 2.94$, $p = .056$, and will be interpreted accordingly. As can be seen in Figure 2, the 6-week science grades for the control group, positive g-o-c group and the negative g-o-c group were 87.71, 83.68 and 88.14 respectively. Post hoc comparisons of these group means using Fisher's Least Significant Differences (lsd) statistic. This post hoc statistic was used rather than Tukey (hsd) statistic because Fisher's (lsd) is a more liberal statistic and is readily applicable to ANOVA results which approach significance. This analysis showed that the control and negative g-o-c groups obtained higher 6-week science grades than the positive g-o-c group. The control group's and negative g-o-c group's six-week science grades did not differ from each other, however. The results suggest that pretreatment differences
in 6-week science grades may have contributed to subsequent group differences in academic performance, and thus must be controlled statistically using analysis of covariance.

**Assignment Difficulty.** A final preliminary analysis was conducted in order to assess any differences between the experimental groups relative to the difficulty of the written assignments given to them by their respective teachers. Each teacher was asked to rate each assignment given by her with a difficulty rating of 0, 1 or 2 (See Appendix A). The mean difficulty ratings for each group at each phase are presented in Figure 3. As can be seen, the mean difficulty ratings for the control group, positive g-o-c group and negative g-o-c group at each phase were: baseline (1.25, 1.13 and .75); Phase-1 (.9, .9 and 1.0); and Phase-2 (1.25, 1.13 and 1.25). These group means were analyzed using a one-way ANOVA for repeated measures. The group effect, $F(2,3) = .21, p > .05$ and the group x phase interaction, $F(4,4) = 3.29, p > .05$, were not statistically significant, indicating that the mean difficulty ratings for each treatment condition were not different from each other. Therefore, it may be concluded that assignment difficulty was not a contributing variable to
Figure 3. Mean Difficulty Ratings

C = Control Group
+ = Positive G-O-C
- = Negative G-O-C
subsequent group differences.

Given the results of the preliminary analyses regarding achievement test scores, science grades, and difficulty ratings, one might hypothesize that academic performance may have been affected by pretreatment group differences in academic achievement (as measured by the MAT-6) and in 6-week science grades. This possibility will be examined in the following section.

Academic Performance

A 3 (Group) x 3 (Phase) ANOVA for repeated measures was used to analyze academic performance. The effect due to the experimental treatments was significant $F(2, 123) = 28.51, p < .0005$. In addition, the Wilks' Lambda Criterion yielded significant effects due to phase $F(2, 122) = 12.46, p < .0005$, and, of most importance, a significant group x phase interaction, $F(4, 244) = 5.23, p < .0005$. The interaction showed that the trend of academic performance across the three phases was not similar for all three groups. Figure 4 depicts the significant group x phase interaction. As can be seen, the mean scores for the control group, positive g-o-c group and the negative g-o-c group at each phase were as follows: baseline (78.61, 87.07 and 90.81); Phase-1 (82.60,
Figure 4. Group X Phase Interaction for Academic Performance

C = Control Group

+ = Positive
G-O-C

- = Negative
G-O-C
89.51 and 90.50); and Phase-2 (81.43, 90.79 and 95.16). The differences among these means were further analyzed using the Tukey (hsd) statistic. These comparisons showed that the negative g-o-c group performed better than the control group during the baseline phase and during Phase-2. The mean scores for the negative g-o-c group and the control group were 90.81 and 78.61 (baseline) and 95.16 and 81.43 (Phase-2), respectively. However, the negative g-o-c did not perform significantly better than the control group during Phase-1, nor did the negative g-o-c perform significantly better than the positive g-o-c at any phase. Furthermore, the academic performance between the positive g-o-c group and the control group did not differ significantly.

As was previously mentioned, the negative g-o-c group entered the study with a significantly higher overall mean achievement test score than did either of the other experimental groups. Additionally, the control group and the negative g-o-c group had obtained higher 6-week science grades than had the positive g-o-c group. In order to evaluate the potential influence of these differences upon academic performance, a one-way analysis of covariance with two covariates was computed. The results of this
analysis indicated that the first covariate (6-week science grades) was significant at all phases: $F(1,121) = 82.61, p < .0005$ (Baseline); $F(1,121) = 24.30, p < .0005$ (Phase-1); and $F(1,121) = 30.89, p < .0005$ (Phase-2). The second covariate (achievement test scores) was significant for both treatment phases, $F(1,122) = 7.150, p < .009$ and $F(1,122) = 11.314, p < .001$; but it was not significant during the Baseline phase, $F(1,122) = 1.64, p > .05$. These results demonstrate that the pretreatment MAT-6 and 6-week science grade differences among the groups, did account for some of the group variability in academic performance. Further analyses of the adjusted means for academic performance yielded a significant group effect for all three phases, $F(2,121) = 30.33, p < .0005$ (Baseline); $F(2,121) = 23.87, p < .0005$ (Phase-1); and $F(2,121) = 53.50, p < .005$ (Phase-2).

The results of these analyses are presented in Table 6. As can be seen from this table, there were significant differences among the treatment conditions, at each phase. The Bryant Paulson Generalization of Tukey's HSD statistic was applied to the adjusted means to determine which of the three groups were significantly different from each other. When the means are adjusted for the effects of the covariates, both the positive g-o-c and the negative g-o-c group achieved significantly higher science grades
TABLE 6
SUMMARY OF POST HOC COMPARISONS FOR GRADES
ADJUSTED FOR SIX-WEEK SCIENCE GRADES AND MAT-6 COVARIATES

<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
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<th>Negative</th>
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</thead>
<tbody>
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<td>4.57*</td>
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<td>---</td>
<td>.13</td>
</tr>
<tr>
<td>Negative</td>
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<table>
<thead>
<tr>
<th>Group</th>
<th>Means</th>
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<tbody>
<tr>
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<td>3.73*</td>
</tr>
<tr>
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<tr>
<td>Negative</td>
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<tr>
<td>Negative</td>
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</tbody>
</table>

*Significant at .05 level.
than did the control group at each phase of the study. During Baseline, the positive g-o-c group and the negative g-o-c group obtained respective mean scores of 89.27 and 89.61; and the control group obtained a mean score of 77.74. This pattern continued in Phase-1 and Phase-2 as the two contingency groups again performed significantly better than the control group with mean scores of 90.50 and 89.96 (Phase-1), 91.92 and 94.55 (Phase-2), compared to the control group's mean scores of 82.22 and 80.98 for the same phases.

These results show that there were baseline differences among the groups which affect interpretation of the effect due to treatments. Within-group post hoc comparisons were calculated to determine whether the individual group performances changed from Baseline to Phase 1 and 2 (i.e., can the effect of the treatments be seen across the phases). The findings indicate that only the negative g-o-c group improved from Baseline and Phase-1 to Phase-2. The mean scores for the negative g-o-c group increased from 89.61 and 89.96 (Baseline and Phase-1) to 94.55 (Phase-2). Consequently, one can not clearly determine whether group differences in academic performance are due to the academic performance.

Separate analyses of convariance were also computed for the individual covariates and the results were
consistent with those of the one-way analysis of covariance with two covariates. These individual analyses showed that 6-week science grade covariate accounted for more of the between group variability than did the achievement test covariate. However, the presence of baseline differences among the groups makes it difficult to attribute subsequent Phase-1 and Phase-2 differences to the treatments. Phase-1 and Phase-2 differences may reflect genuine treatment effects. On the other hand, these differences may merely reflect a continued pattern of academic performance, with little or no effect due to treatment. In view of the confusing data, hypothesis one is not adequately supported.

Classroom Behavior

The effects of each treatment condition on classroom behavior was analyzed using a 3 x 3 multivariate analysis of variance (MANOVA) for repeated measures. The results of this analysis indicated that classroom behavior was virtually unaffected by the different group-oriented contingencies. There was no main effect for group, $F(2,60) = .79, p > .05$; nor was there a significant group x phase interaction, $F(4,118) = .73, p > .05$. Therefore, the results of this analysis did not support the hypothesis that the positive g-o-c would
systematically increase on-task classroom behavior more than the negative g-o-c or the control group.

Social Interactions

A repeated measures MANOVA was also conducted on the social interaction behavior of the students. Three dependent variables were examined: positive, neutral, and negative social interactions. The results of this analysis indicated a significant main effect for phase, \( F(2,59) = 66.74, p < .005 \) and a significant group by phase interaction, \( F(4,118) = 66.74, p < .0005 \), using the Wilks Lambda Criterion; but no significant main effect for group, \( F(2,60) = 1.12, p > .05 \). These results suggest that, overall the different group-oriented contingencies did not significantly affect the social interactions of the students. Social interactions did, however, change across phases as a function of group. These differences are demonstrated by significant follow-up ANOVAs for positive social interactions during Phase-1 \( F(2,60) = 6.15, p < .004 \), and neutral social interactions during Phase-1, \( F(2,60) = 3.60, p < .04 \). Further examination of these groups with post hoc Tukey (hsd) statistics indicated that during Phase-1, the positive-g-o-c group demonstrated significantly more positive social behavior than did
the control group. The mean scores for the positive g-o-c and the control group were 1.24 and .04 respectively. The negative g-o-c did not differ from the control group nor did the two group-oriented contingencies differ from each other. Although an ANOVA for neutral social interactions during Phase-1 was also significant, the follow up comparisons with Tukey (hsd) did not reveal differences among the groups.

In an effort to further understand the phase x group interaction, additional Tukey's were conducted to analyze the within group differences across the phases. A trend of increased positive and neutral social interactions was demonstrated for the positive g-o-c group, and a trend of increased neutral social interactions was demonstrated for the negative g-o-c group. Tables 7 and 8 reflect the mean scores and significant differences between phases for the different group-oriented contingencies. As can be seen from these tables, the mean scores for the positive g-o-c group increased significantly from baseline for both positive and neutral social interactions. The baseline means for these two behaviors for the positive g-o-c group were .53 and .42, respectively. Following the implementation of the group-oriented contingency, the mean scores for these behaviors
### Table 7

**Positive Social Interaction Results of the Tukey (HSD) Test Examining Within Group Differences**

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Phase-1</th>
<th>Phase-2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>.63</td>
<td></td>
<td>.421*</td>
</tr>
<tr>
<td>Phase-1</td>
<td>.04</td>
<td></td>
<td>.57*</td>
</tr>
<tr>
<td>Phase-2</td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negative C-O-C</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>.53</td>
<td></td>
<td>.507*</td>
</tr>
<tr>
<td>Phase-1</td>
<td>1.24</td>
<td></td>
<td>.57</td>
</tr>
<tr>
<td>Phase-2</td>
<td>1.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Positive C-O-C</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>.23</td>
<td></td>
<td>.243</td>
</tr>
<tr>
<td>Phase-1</td>
<td>.57</td>
<td></td>
<td>.14</td>
</tr>
<tr>
<td>Phase-2</td>
<td>.59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at .05 level.*
TABLE 8
NEUTRAL SOCIAL INTERACTION RESULTS OF THE TUKEY (HSD) TEST
EXAMINING WITHIN GROUP DIFFERENCES

<table>
<thead>
<tr>
<th>CONTROL GROUP</th>
<th>PHASE MEANS</th>
<th>Baseline</th>
<th>Phase-1</th>
<th>Phase-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>.87</td>
<td></td>
<td>2.21</td>
<td>1.79</td>
</tr>
<tr>
<td>Phase-1</td>
<td>.45</td>
<td></td>
<td></td>
<td>4.00*</td>
</tr>
<tr>
<td>Phase-2</td>
<td>1.21</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NEGATIVE G-O-C</th>
<th>PHASE MEANS</th>
<th>Baseline</th>
<th>Phase-1</th>
<th>Phase-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>.42</td>
<td></td>
<td>4.42*</td>
<td>5.95*</td>
</tr>
<tr>
<td>Phase-1</td>
<td>1.26</td>
<td></td>
<td></td>
<td>1.53</td>
</tr>
<tr>
<td>Phase-2</td>
<td>1.55</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POSITIVE G-O-C</th>
<th>PHASE MEANS</th>
<th>Baseline</th>
<th>Phase-1</th>
<th>Phase-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>.59</td>
<td></td>
<td>3.16</td>
<td>3.53*</td>
</tr>
<tr>
<td>Phase-1</td>
<td>1.19</td>
<td></td>
<td></td>
<td>.37</td>
</tr>
<tr>
<td>Phase-2</td>
<td>1.26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at .05 level.
increased to 1.24 and 1.16 (positive social interactions) and 1.26 and 1.55 (neutral social interactions). The negative g-o-c group demonstrated a similar trend for the neutral social interactions. This group's neutral social interactions increased from a baseline mean score of .59 to a Phase-2 mean score of 1.26. Although the Phase-1 mean score was not larger than the baseline mean score for neutral social interactions for the negative g-o-c group, the trend was similar. These analyses, therefore, do not support the hypothesis that the positive g-o-c would be superior to the negative g-o-c for improvement of peer social interactions. However, they do suggest that both group-oriented contingencies resulted in more positive or neutral social interactions among the students from Baseline to Phase-2.

**Peer Sociometric Ratings**

In an effort to determine whether peer sociometric ratings systematically improved as a result of the positive g-o-c intervention, a 3 x 3 ANOVA for repeated measures was used to analyze peer sociometric ratings across the three experimental conditions. This analysis showed that the group effect, $F(2,123) = 1.46, p > .05$ was not significant. However, the group x phase interaction, $F(4,244) = 2.335, p = .056$, and the phase effect, $F(2,122) = 7.18, p < .001$ (Wilks' Lambda
Criterion), were significant and will be interpreted. The results suggest that peer ratings were affected differently by the group-oriented contingencies during specific phases of the study. To further understand this interaction post hoc Fisher (lsd) statistics were computed. Again, Fisher's (lsd) was used because of its ability to handle ANOVA results at the .056 level of significance. Figure 5 depicts the group by phase interaction and the mean peer rating scores for each group at each phase. The mean scores for the control group, positive g-o-c group and the negative g-o-c group at each phase were as follows: 3.97, 3.91 and 3.87 (Baseline); 4.07, 3.87, and 3.70 (Phase-1); and 4.14, 3.94 and 3.97 (Phase-2). As can be seen from Figure 5, the positive and negative g-o-c groups received lower peer ratings from their classmates than did the control group during Phase-1. The two contingency groups did not differ from each other, however. This trend in peer ratings did not continue into Phase-2, as the peer ratings among the three experimental groups were not significantly different. These results do not support the hypothesis that the positive g-o-c would improve peer sociometric ratings more than the negative g-o-c or the control group.

Acceptance Ratings

Teacher and student acceptance ratings were also analyzed using a separate ANOVAs for each question on
Figure 5. Group X Phase Interaction for Peer Sociometric Ratings

C = Control Group

+= Positive G-O-C

-= Negative G-O-C
the Intervention Rating Profile (IRP-15) (teacher version) and the Children's Intervention Rating Profile (CIRP) (student version). Tukey (hsd) statistics were used to further examine significant group differences.

Teachers. According to the ANOVAs computed on questions 4, 5, 8, 9, 10, 11, 12 and 13 of the IRP-15 (see Appendix I), there were no significant group differences in teacher responses to those questions. Consequently, one could conclude that teacher responses to the identified questions were virtually unaffected by their inclusion in a specific experimental condition. However, teacher responses to questions 1, 2, 3, 6, 7, 14 and 15 were significantly different. Table 9 presents the summary of the ANOVA results reflecting the treatment effect for questions 1, 2, 3, 6, 7, 14 and 15. Responses to these questions were generated on a scale from 1 - 6 where 1 suggested strong disagreement and 6 suggested strong agreement. Post hoc comparisons of the mean response scores for each question (with the exception of question 1) showed that the teachers using the positive and negative group-oriented contingencies consistently responded more favorably regarding the behavioral intervention used in their classrooms, than did the control group teachers. On
TABLE 9
SUMMARY OF THE ANOVA RESULTS REFLECTING THE TREATMENT EFFECT
FOR THE IRP-15 QUESTIONS 1, 2, 3, 6, 7, 14 and 15

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>MEAN SCORES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>df</td>
</tr>
<tr>
<td>1. This would be an acceptable intervention for children's academic behavior.</td>
<td>2, 3</td>
</tr>
<tr>
<td>2. Most teachers would find this intervention appropriate for academic behavior.</td>
<td>2, 3</td>
</tr>
<tr>
<td>3. This intervention should prove effective in changing academic behavior.</td>
<td>2, 3</td>
</tr>
<tr>
<td>6. Most teacher's would find this intervention suitable for academic behavior.</td>
<td>2, 3</td>
</tr>
<tr>
<td>7. I would be willing to use this intervention in the classroom setting.</td>
<td>2, 3</td>
</tr>
<tr>
<td>14. This intervention was a good way to handle the children's academic behavior.</td>
<td>2, 3</td>
</tr>
<tr>
<td>15. Overall, this intervention would be beneficial for children.</td>
<td>2, 3</td>
</tr>
</tbody>
</table>
question 1, only the positive g-o-c teachers responded more favorably than did the control group teachers, but not significantly different than the negative g-o-c teachers. Additionally, the negative and positive g-o-c teacher responses did not differ. As can be seen from an examination of the mean scores, the positive and negative g-o-c teachers consistently responded more favorably about the acceptability, appropriateness and effectiveness of the specific intervention used in their respective classrooms. Therefore, although both behavioral interventions were rated higher than the control group on seven of the IRP-15 questions, one cannot conclude that the teachers were able to distinguish between the positive and negative group-oriented contingencies.

**Students.** Student responses to the CIRP (see Appendix J) showed that there were no group differences on questions 1, 2, 4 and 6. Student responses to these questions were unaffected by their inclusion in a specific experimental condition. However, student responses to questions 3, 5 and 7 differed as a function of group. Table 10 presents the summary of the ANOVA results reflecting the treatment effect for questions 3, 5 and 7. Responses to these questions were derived from a six-point rating
### TABLE 10
SUMMARY OF THE ANOVA RESULTS REFLECTING THE TREATMENT EFFECT FOR THE CIRP QUESTIONS 3, 5 and 7

<table>
<thead>
<tr>
<th>QUESTIONS</th>
<th>df</th>
<th>F</th>
<th>PROBABILITY LEVEL</th>
<th>CONTROL GROUP</th>
<th>POSITIVE G-O-C</th>
<th>NEGATIVE G-O-C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. The method used in our class may cause problems with our friends.</td>
<td>2,117</td>
<td>4.61</td>
<td>.012</td>
<td>3.81</td>
<td>4.89</td>
<td>3.87</td>
</tr>
<tr>
<td>5. The method used by our teacher would be a good one to use with other children.</td>
<td>2,117</td>
<td>5.09</td>
<td>.008</td>
<td>2.37</td>
<td>1.53</td>
<td>2.21</td>
</tr>
<tr>
<td>7. I think that the method used for our class would help other children do better in school</td>
<td>2,117</td>
<td>3.77</td>
<td>.026</td>
<td>2.65</td>
<td>1.76</td>
<td>2.59</td>
</tr>
</tbody>
</table>
scale where 1 suggested strong agreement and 6 indicated strong disagreement. Post hoc comparisons showed that the positive g-o-c group consistently responded more favorably than either the control group or the negative g-o-c group. On question 3, the positive g-o-c group disagreed more than the control group or the negative g-o-c that the use of the positive g-o-c might cause problems with their friends. There were no significant differences on this question between the negative g-o-c and the control group. Similarly, on question 5, the students in the positive g-o-c group rated the behavioral intervention more favorably than the other two groups for use with other students. Again, the negative g-o-c group and the control group did not differ in their responses to this question. Finally, on question 7, the positive g-o-c students responded more favorably than the control group regarding their belief that the intervention "would help other children do better in school." The positive and negative g-o-c groups did not differ in their responses to this question; nor did the negative g-o-c differ from the control group. Unlike the teachers, the students seemed to make more subtle distinctions between the positive and negative g-o-cs, with the
positive g-o-c consistently receiving the most favorable ratings on questions 3, 5 and 7.

A one-way ANOVA was also computed on the CIRP data to examine total score differences among the groups. The results of this analysis indicated that the group responses did not differ, $F(2,117) = .01, p > .05$. CIRP total score intercorrelations among the experimental groups are presented in Appendix J and the intercorrelations among individual questions of the CIRP are presented in Appendix K.
DISCUSSION

**Academic Performance**

As was predicted by the first hypothesis of this study, the groups receiving positive and negative group-oriented contingencies had higher academic performance than the group receiving no treatment. This finding was, however, confounded by the finding that the two treatment groups also had higher academic performance during Baseline. Therefore, it is difficult to determine whether the group differences at Phases 1 and 2 are due to the effect of treatment, or whether those differences merely reflect the initial group differences. Follow-up comparisons suggest that at least one of the treatment groups demonstrated significant improvement from Baseline to Phase-2. This trend may support the validity of the group differences which resulted during the treatment phases. Nevertheless, this data is insufficient to empirically attribute treatment phase group differences solely to the treatments.

**Collateral Behaviors**

Although academic performance was the behavior
chosen for direct manipulation using the group-oriented contingences, of secondary importance were the effects of the positive g-o-c on several collateral behaviors. Previous research had shown that collateral effects of specific group-oriented contingencies had typically been examined as interesting side-effects or anecdotal results, but collateral behaviors had not often been systematically examined as dependent variables of specific interest (Broughton and Lahey, 1978; Darveaux, 1984; Frankosky and Sulzer-Azaroff, 1978; Speltz, et al., 1982). In this study, collateral behaviors were systematically examined to determine whether they also changed as a function of the use of the positive g-o-c.

Three collateral behaviors were examined: classroom behavior, social interactions and peer sociometric ratings. Of these behaviors, classroom behavior was probably least affected by the experimental conditions. The results showed that there were no differences among the experimental groups in terms of their levels of on-task, off-task or disruptive behavior from Baseline to Phase-2 of the study. These findings support earlier research that that although classroom behavior and academic performance are both amenable to direct behavioral intervention, these
behaviors do not necessarily change or improve as a function of indirect intervention (Ayllon, et al., 1972; Ayllon, et al., 1975; Ayllon and Roberts, 1974; Broughton and Lahey, 1978; Hay, et al., 1977; Kirby and Shields, 1972). Consequently, the hypothesis that classroom behavior would improve as a function of the positive g-o-c, but not as a function of the negative g-o-c or no treatment, was not supported by these results.

The data on the second class of collateral behavior, social interactions, showed some effects attributable to the interventions. The results of the MANOVA used to analyze this data, showed a main effect of phase, as well as a significant group x phase interaction. During Phase-1, the students in the positive g-o-c group exhibited more positive social interactions with their peers, than the control group students. The positive g-o-c group did not demonstrate more social interactions than the negative g-o-c group; nor were there differences between the negative g-o-c group and the control group. The positive g-o-c group may have been temporarily excited about the group contingencies and that excitement may have been shown through increased positive social interactions with their peers. However, this phenomena was only temporary and was not maintained through Phase-2. Therefore, these
findings do not support Hypothesis 2 that the positive g-o-c would improve social interactions better than the negative g-o-c or the control group.

In an effort to better understand the interaction that resulted from the social interaction data, within group post hoc comparisons were computed. An interesting finding developed as both the negative and positive g-o-c groups demonstrated more neutral social interactions from Baseline to Phase-2. Additionally, the positive g-o-c also demonstrated more positive social interactions from Baseline to Phase-2. This trend was not found for the control group whose social interactions were stable from Baseline to Phase-2. These results can be interpreted as resulting from: 1) the interdependent cooperation required by the students in order for them to successfully earn the group reinforcement (i.e., the students by necessity worked together to insure group performance at the level required by the contingency system); and 2) the negative g-o-c group entered the study with a higher overall level of achievement which supports the notion that these students were comfortable with neutral social interactions relating to school work. Therefore, the observation that the positive g-o-c readily exhibited more positive and neutral social interactions, and the negative g-o-c group
exhibited more neutral social interactions from Baseline to Phase-2 is not surprising. The control group did not have the benefit of the group-oriented contingency systems or the pretreatment level of achievement to experience (even temporarily) the collateral effects of increased social interactions among the students. This fact becomes increasingly important when one remembers that academic productivity and social acceptance are two critical factors whose presence or absence may place a child at greater risk for academic failure and subsequent adulthood maladjustment (Barth, 1983; Keisling, 1983; Pigott, et al., 1985).

It is also worth noting that the sample of students who participated in this study attended a school which was located in an upper middle class community. One might expect, therefore, that many of these students entered the study with a higher level of interpersonal skill than a more representative same of fourth and fifth grade students.

The last collateral behavior examined in this study was peer sociometric ratings. Significant phase and group x phase effects indicated differences among the experimental groups relative to the peer sociometric ratings. During Phase-1, the positive and negative g-o-c groups received lower mean peer ratings than did the control group. At first glance,
this trend in peer ratings might lead one to accept the validity of early criticisms of group-oriented contingency systems that negative peer pressure may be fostered (Axelrod, 1973; Bear and Richards, 1980; McLaughlin, 1974; O'Leary and Drabman, 1971; Packard, 1970; Shores, Apolloni, and Norman, 1976). However, the trend in lowered peer ratings for the two group-oriented contingencies did not continue into Phase-2 of the study as the groups received similar sociometric ratings in this phase. Consequently, one might conclude that the two treatment groups experienced a temporary reaction to the interventions that may have fostered more competitiveness and less cooperation among the students. However, when one looks at the overall effect of the positive and negative group-oriented contingencies on peer sociometric ratings, one finds that the results parallel other studies which have found the peer pressure which accompanies the use of group-oriented contingencies facilitative rather than detrimental (Evans and Oswalt, 1968; McCarthy, Griffin, Apollini, and Shores, 1977; Pigott, et al., 1986; Sloggett, 1971).

Acceptance Ratings

One of the most recent directions for group-oriented contingency research involves assessing teacher and student satisfaction with school-based interventions
A review of the literature shows that more often acceptance ratings are solicited from the teachers or the students; yet rarely are the two compared to each other (Witt and Elliott, 1985). Furthermore, acceptance ratings are frequently derived from analogue situations wherein teachers, elementary or college students are presented vignettes describing problem behaviors and are asked to rate the acceptability of several hypothetical interventions (Witt and Elliott, 1985). This study has attempted to assess the acceptability of two behavioral treatments which were implemented in natural settings. Thereafter, acceptability ratings were obtained from the teachers who implemented the treatment and the students for whom the intervention was developed. Furthermore, the CIRP has recently been developed and this study provides an opportunity to examine responses generated by it in relation to other data.

Generally speaking, teachers and students gave the positive and negative g-o-cs higher acceptability ratings than the control group students and teachers. Students and teachers seemed to accept these behavioral interventions as effective tools which could be used to improve academic performance. A distinction was made, however, between students and teachers regarding the acceptability of the positive
g-o-c compared to the negative g-o-c. Teachers typically rated both g-o-cs higher than the control group. Yet, students were able to distinguish subtle differences between the positive g-o-c and the negative g-o-c and more often than not, students rated the positive g-o-c more favorably. This finding seems to lend support to the idea that student and teacher acceptance of an intervention may vary and needs to be examined independently in an effort to select acceptable, as well as effective interventions for use in classroom settings. Furthermore, student responses to question 3 of the CIRP, "The method used in our class may cause problems with our friends," provides self-report data supporting the idea that group-oriented contingency systems do not necessarily foster negative peer pressure.

Implications for Further Study

As the group-oriented contingency literature suggests, there are yet many unanswered questions concerning the use of these interventions in academic settings. Consequently, further study is needed to address many of the questions raised by this and previous studies. A frequently asked question is whether or not an increase in the number of behavioral interventions rated "acceptable" leads to greater use of these "acceptable"
interventions. Previous studies suggest that there is a void between the number of school-based interventions with proven acceptability and effectiveness and the number of school-based interventions that are actually used.

It would be interesting to determine whether the teachers in this study continue to use the intervention in their classroom, or whether the void continues between use and acceptability. Follow-up research would be able to answer this question and examine various reasons for the continued use or nonuse of interventions previously rated acceptable by teachers.

It would also be of interest to examine more closely the individual performance of students within experimental groups. Several studies cite differences in the performance of high, medium, and low achievers under the various group-oriented contingency systems. In a recent study, Shapiro and Goldberg (1986), raised the point that the effects of group-oriented contingencies may be somewhat different for individuals of various performance levels. They found that students who had generally performed low in spelling exhibited substantially more variability under the interdependent condition than under either the dependent or independent conditions. These studies identify a need to look at the group differences, as well as individual differences among students relative
to changes in academic performance, classroom behaviors, social interactions, peer sociometric ratings, etc. Subtle differences may be found among individual students which will not be identifiable when examining group differences alone. The subtle differences may point to the use of specific types of group-oriented contingencies with specific students, behaviors, etc.

If this study were replicated, at least two methodological concerns should be addressed. First, the representativeness of the sample and subsequent generalizability of the results are problemed by two sampling factors. First, the group of fourth and fifth graders used in this study possessed a higher overall mean achievement score than fourth and fifth graders in general. Secondly, the population from which this sample was drawn was an upper middle class community. With these two facts in mind, one must interpret the results of this study carefully. Therefore, this study should be replicated with a broader sample of students to increase the generalizability of the results.

Also of methodological concern is the variability among assignments given by individual teachers. If this study were to be replicated, greater effort
should be made to control similarities and differences among assignments given beyond the difficulty ratings employed here. Assignment variability was minimally controlled and the uncontrolled effects of other differences in assignments (e.g., type of items, etc.) remain unknown. These results, therefore, could easily be replicated using one teacher with several classes (i.e., on a junior or senior high school level). This would allow for control of assignment differences, and for differences in teaching styles/effectiveness that were also not readily controlled in the present study.

Summary

The results of this study clearly showed that the students' academic performance under the interdependent group-oriented contingencies (positive g-o-c and negative g-o-c) was significantly higher than the academic performance of the control group. However, this trend of higher performance also existed prior to the implementation of the treatments and this affects interpretation of the academic performance data. Although the negative g-o-c group demonstrated improvement in academic performance from Baseline to Phase-2, that result is insufficient to clearly support Hypothesis 1 that the interdependent group-oriented contingencies would improve academic performance better than no treatment.
This study also provided a systematic examination of the effect of the positive and negative group-oriented contingencies on several collateral behaviors. Although classroom behavior was virtually unaffected by the group-oriented contingencies; social interactions and peer acceptance ratings were different among the three experimental groups. More often than not, the positive and negative g-o-cs resulted in improved performance, and the control group's performance remained stable or fluctuated inconsistently. For example, the only improvement in social interaction behavior was seen in the two interdependent g-o-c conditions. The positive and negative g-o-cs demonstrated improved positive and neutral social interactions. The control group's social interaction behavior changed randomly without a trend toward improvement. Therefore, the social interaction data support the continued use of group-oriented contingencies in academic settings. The peer acceptance data also lend indirect support to the continued use of group-oriented contingencies as these results disprove the notion that group-oriented contingencies lead to negative peer pressure and may damage interpersonal relationships.

In addition to the improvement trends attributable to both the positive and negative g-o-cs, student
responses and behaviors reflected subtle differences between the positive and negative g-o-cs. Both teacher and student acceptance ratings supported the use of interdependent group-oriented contingencies to improve academic performance. However, students' social behavior and acceptance ratings reflect a small preference for the positive g-o-c. The students under the positive g-o-c condition demonstrated improved positive and neutral social interactions from Baseline to Phase-2. These students also rated the behavioral intervention used in their class more favorably than the negative g-o-c or control group. Consequently, these data lend support to the use of behavioral interventions which encourage on-task behaviors rather than interventions which attempt to minimize and/or discourage off-task or disruptive behavior. The acceptance data also highlighted the importance of obtaining teacher and student acceptability ratings of school-based interventions insofar as there may be subtle differences between their ratings which would directly impact on the efficacy of the intervention.
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Speltz, M. L., Shimamura, J. W., & McReynolds, W. T.
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Wilson, C. W., & Hopkins, B. L. (1973). The effects of contingent music on the intensity of noise in junior


APPENDIX A

Definitions for Difficulty Ratings

"0" Rating— an assignment will be given a difficulty rating of "0" if the material contained in the assignment has been covered on three or more days prior to this assignment. This material is defined as "old" material.

"1" Rating— an assignment will be given a difficulty rating of "1" if the material contained in the assignment has been covered on one or two days prior to this assignment. This material is defined as "reviewed" material.

"2" Rating— an assignment will be given a difficulty rating of "2" if the material contained in the assignment has never been covered prior to this assignment. This material is defined as "new" material.
Appendix B

Examples for Classroom Behaviors

On-Task Behaviors

1. Looking at Teacher--Student's eyes and head are pointed in the direction of the person who is speaking to the class. This may be a student or the teacher.

2. Looking at Book or Other Assigned Material--Student's eyes and head are pointed in the direction of a book, page or other material which was verbally assigned by teacher.

3. Writing Answers to Questions--Student has pen, pencil or crayon in hand and is making marks on paper or assignment sheet according to previous verbal instruction of the teacher.

4. Getting Materials--Student is picking up materials from desk, or from verbally identified areas in the room and begins using those items to complete teacher instructed task.

5. Putting up Materials--Student is returning materials previously used in a teacher instructed task to his/her desk or to some other verbally identified material areas in the classroom.

6. Talking with Permission--Student has requested and received or teacher has given blanket permission to the class to talk with classmates or with the teacher in order to complete a task/activity.

7. Turning to Appropriate Page or Assignment--Student is flipping page(s) in book following teacher prompt to do so, or as he/she works independently on assigned task.

8. Raising Hand--Student's hand is held in a vertical position with hand extending above his/her shoulder.

Off-Task Behaviors
1. Looking Away—Student's eyes and head are not pointed in the direction of person speaking (student or teacher) or at appropriate written materials as instructed by teacher.

2. Eating/Chewing—Student's jaw is moving up and down repeatedly and no verbal communication is forthcoming.

3. Taking Other's Items—Student removes personal/school items from on, around or near the desk of the teacher or another student without verbal permission from that person to do so.

4. Sleeping—Student places his/her head on the desk, eyes are closed and student does not move. This behavior is not scored off-task if teacher prompted as a class activity.

5. Failure to Turn to Appropriate Page or Assignment—Student does not turn page in book or pick up assignment page as verbally instructed to do so by the teacher.

6. Drawing Picture or Scribbling—Student is making marks on his/her paper and these marks have not been requested or prompted by verbal teacher instruction.

7. Failure to Shift to Appropriate Activities—Student 1) continues to work on previous task, despite teacher instruction to shift or 2) shifts to appropriate activity but not in accordance with classroom rules.

Disruptive Behavior

1. Calling out in Class—Student verbally calls the name of another student or the teacher without teacher permission or student calls out the response to a question without first raising his/her hand.

2. Making Noises—Student uses body parts, clothing, classroom materials, etc. to make noises which he/she has not been instructed or requested to make by the teacher.

3. Talking without Permission—Student has not requested and received teacher permission to talk or teacher has not given blanket permission to the class
to talk as a group.

4. Physical or verbal aggressiveness—Student touches or disturbs another student's body or personal belongings without that student's verbal permission or student uses profanity while talking with another student or with the teacher.

5. Destruction of Personal/School Property—Student breaks or damages someone's personal property or property of the school.

6. Out of Seat Without Permission—Student stands and walks away from his/her seat without being requested to or without first obtaining permission from the teacher to do so.

7. Running—While in an upright position, student moves his/her body across the room at a fast pace (approximately 3 feet per second).

8. Yelling—Talking loudly enough to be heard in the hallway.
APPENDIX C

BEHAVIOR RATING FORM
(Classroom Behaviors and Social Interactions)

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INDIVIDUAL TOTALS

RATER ___________ TEACHER ___________ DATE ___________

122
Appendix D

Sociometric Rating Form

Boys or Girls

Date ____________________ Class ____________

We would like to learn how much you like to play with each one of the boys or girls in your class. Please circle the number that describes how much you like to play with each boy or girl in your class. Each boy or girl in your class is listed and should be rated by you according to the following scale. Please do not rate yourself.

1 = dislike playing with very much
2 = dislike playing with
3 = don't like or dislike playing with
4 = like playing with
5 = like playing with very much

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Appendix E
Definitions for Behavior Observation Categories
(Social Interaction Patterns)

Interacting with peer, neutral

The student is interacting with a peer or peers. The following verbal behaviors are coded in this category:

1. General discussion or nonnegative comment directed to a peer(s), (e.g., statements or questions such as "Look at this."); "What are you doing?").
2. Nondirected verbalizations intended apparently to evoke a verbal or nonverbal response from a peer(s) (e.g., "This is hard!"; "I'm done.").

Interacting with peer, positive

The following verbal and/or nonverbal behaviors are coded in this category:

1. Verbalizations or gestures of friendship, concern, congratulations, gratitude, or encouragement (e.g., compliments, cheering, handshaking, back patting).
2. Requests or offers for assistance or instruction, or gestures apparently for assistance.

Interacting with peer, negative

The following verbal and/or nonverbal behaviors are coded in this category:

1. Name calling or swearing at peer(s).
2. Laughing at a peer's mistakes.
3. Threats of physical aggression.
4. Physical aggression (e.g., hitting, slapping, biting, pushing, rough/forceful back slapping).
5. Obscene gestures, gestures of disgust or disapproval, gestures intended apparently to antagonize or frighten peer(s).
6. Behaviors which prevent or interfere with a (peer)s work activities (e.g., taking a peer's worksheet or pencil).

The definitions for these categories are taken from Speltz, et al., 1982 and Frankosky & Sulzerazaroff, 1978.
Appendix F

Student Survey

(Reinforcement Menu)

Please circle the number which describes your feelings about each of the listed rewards. The rewards should be rated on a scale from 1 - 5 as follows:

1 = disliked very much
2 = kinda disliked
3 = don't dislike or like
4 = kinda liked
5 = liked very much

free time 1 2 3 4 5
extra story time 1 2 3 4 5
playing games 1 2 3 4 5
extra reading time (school books) 1 2 3 4 5
positive teacher remarks 1 2 3 4 5
smiles from teacher 1 2 3 4 5
hugs from teacher 1 2 3 4 5
public verbal recognition 1 2 3 4 5
phone call to parent(s) 1 2 3 4 5
listening to records 1 2 3 4 5
good citizen sign on desk 1 2 3 4 5
helping teacher 1 2 3 4 5
being in charge of sharing time 1 2 3 4 5
seeing videos 1 2 3 4 5
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<td>extra reading time (magazines)</td>
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<td>popping corn</td>
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<td>coloring</td>
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<td>talking with classmates</td>
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Appendix G

Parental Consent Letter

Dear Parents:

I will be conducting a research project designed to study the direct and indirect effects of a group behavior management program on children's academic performance, classroom behavior, social status and ways of interacting with their classmates. I request permission for your child to participate. The study consists of permitting the children to earn school rewards based upon their academic performance. The study will last nine weeks and will be conducted in their science class only. The goals of the study are to determine an effective method of improving academic performance, decreasing disruptive classroom behavior, and improving the social interactions among all children in the classroom.

The behavior management program will be administered by your child's teacher, who has also consented to participate in this study. Each child will be invited to participate in the study, but will be included in the study only if he or she is willing to do so. Children usually enjoy games and experiments, so I expect that they will be interested. In addition to their regular classwork, the children will be requested to complete two questionnaires. Children's responses will be kept confidential and will be reported as group results only. At no time throughout the study will student performances or responses be identified by name. Parent volunteers will also observe the classroom weekly to rate the level of disruptive behavior and the interactions among the students.

Your decision whether or not to allow your child to participate will in no way affect your child's standing in his or her class/school. At the conclusion of the study, a summary of group results will be made available to all interested parents and teachers. Should you have any questions or desire further information, please call me at 351-8156. Thank you in advance for your cooperation and support.
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY ASSISTANT SUPERINTENDENT OF ELEMENTARY EDUCATION, EARLE D. OLDHAM (PHONE: 351-8243).

Sincerely,

Verdi R. Lethermon, M.A.
Associate Psychologist
Tomball I. S. D.

Please indicate whether or not you wish to have your child participate in this project or not, by checking a statement below and returning this letter to your child's teacher as quickly as possible.

___ I do grant permission for my child, _______________, to participate in this project.

___ I do not grant permission for my child, _______________, to participate in this project.

Parent/Guardian Signature
Date: ________________
APPENDIX H

Name:

INTERVENTION RATING PROFILE
(IRP-15)

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. Please respond the following statements as they pertain to the behavioral intervention used in your classroom. Please circle the number which best describes your agreement or disagreement with each statement.

1. This would be an acceptable intervention for children's academic behavior. 1 2 3 4 5 6

2. Most teachers would find this intervention appropriate for academic behavior. 1 2 3 4 5 6

3. This intervention should prove effective in changing academic performance. 1 2 3 4 5 6

4. I would suggest the use of this intervention to other teachers. 1 2 3 4 5 6

5. The child's academic problems are severe enough to warrant use of this intervention. 1 2 3 4 5 6

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6. Most teachers would find this intervention suitable for academic behavior.

7. I would be willing to use this intervention in the classroom setting.

8. This intervention would not result in negative side-effects for the child.

9. This intervention would be appropriate for a variety of children.

10. This intervention is consistent with those I have used in classroom settings.

11. The intervention was a fair way to handle the child's academic problems.

12. This intervention is reasonable for the academic behavior.

13. I liked the procedures used in this intervention.

14. This intervention was a good way to handle the children's academic performance.

15. Overall, this intervention would be beneficial for children.
APPENDIX I
CHILDREN'S INTERVENTION RATING PROFILE

We want you to help us select classroom programs that will be used by teachers of children with academic problems. Please circle the number which best describes your agreement or disagreement with each statement.

I agree | I do not agree
---|---
1. The method used in our class was fair. | 1 2 3 4 5 6
2. Our teacher was too harsh on us. | 1 2 3 4 5 6
3. The method used in our class may cause problems with our friends. | 1 2 3 4 5 6
4. There are better ways to handle a class than the one used in our class. | 1 2 3 4 5 6
5. The method used by our teacher would be a good one to use with other children. | 1 2 3 4 5 6
6. I like the method used in our class. | 1 2 3 4 5 6
7. I think that the method used for our class would help other children do better in school. | 1 2 3 4 5 6
### Appendix J

CIRP Total Score Intercorrelations Among The Experimental Groups

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Appendix K

Intercorrelations Among Individual Questions of the CIRP

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Vita

Verdi Rountree Lethermon was born on June 20, 1955, in New Orleans, Louisiana. As the daughter of Retired Col. Herbert A. Rountree and Mrs. A. Rose Rountree, she attended public schools throughout the United States and Europe, and graduated from Block High School, Jonesville, Louisiana, in 1973. She subsequently graduated from Southern University and A & M College in 1976 with a Bachelor of Arts degree in Political Science. Planning to attend law school, she worked in two law offices until 1979 when she began graduate studies in clinical psychology at the Baton Rouge campus of Louisiana State University. She also married Walter Lethermon, Jr. in 1979. She received her Master of Arts degree in clinical psychology from Louisiana State University in 1981. Currently working for Houston Independent School District and in private practice with Brown, Nelson, Faulkner and Associates, upon completion of the doctoral requirements, she will continue several personal and professional pursuits in Houston, Texas.
Candidate: Verdi Rountree Lethermon

Major Field: Psychology

Title of Dissertation: Interdependent Group-Oriented Contingencies: Effects Upon Collateral Behaviors

Approved:

[Signature]
Major Professor and Chairman

[Signature]
Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

September 16, 1987