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Relative efficacy of school-home notes with and without response cost in impoverished elementary school students with Attention-Deficit/Hyperactivity Disorder

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RELATIVE EFFICACY OF SCHOOL-HOME NOTES WITH AND WITHOUT
RESPONSE COST IN IMPOVERISHED ELEMENTARY SCHOOL
STUDENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

A Thesis

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
Master of Arts

in

The Department of Psychology

by
Andrea Nichole Jurbergs
B.A., University of Tennessee at Knoxville, 2000
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ABSTRACT

Daily report cards and punishment have proven to be effective methods of classroom behavior management. However, treatment effectiveness studies have not been designed to adequately compare the effects of rewarding and punishing consequences on behavior through a school-home note. The study of school-home note treatment effectiveness has focused on middle-class students with behavior problems; both ADHD and disadvantaged populations have been underresearched. Using a reversal, alternating treatments design, the present study will examine the effectiveness of a response-cost system added to school-home notes for increasing classwork completion and appropriate classroom behavior in several disadvantaged elementary school children with ADHD.

INTRODUCTION

Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most common reasons children are referred to mental health clinics in the United States, accounting for nearly 50% of all child referrals to outpatient clinics (Frick & Lahey, 1991). Primary symptoms of ADHD include inappropriate levels of inattention, impulsivity, and hyperactivity. Children with ADHD are also at risk for a number of other problems including learning problems, low academic achievement, poor social skills, and low self-esteem (Frick & Lahey, 1991).

Prevalence of ADHD is estimated at 3-7% of school-aged children, depending upon the methods used for assessment (American Psychiatric Association, 2000). Research has shown that ADHD is three to six times more common in males than females (Breen & Altepeter, 1990). Further, ADHD is more commonly diagnosed in children from ethnic minorities than Caucasian (Samuel et al., 1997). Children with ADHD from low socio-economic status families often show more severe symptoms of ADHD than those from middle and upper-class families (Barkley, 1997).

There is a great deal of evidence suggesting that ADHD negatively affects the academic performance of children. Performance differences such as underproductivity, grade repetition, low grades, and placement in special classes are seen significantly more often in students with ADHD (Barkley, 1997). The long-term prognosis of ADHD is not favorable with up to 30% of children with the disorder failing to complete high school (Weiss & Duncan, 1992). As described by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition Text Revision* (APA, 2000), children with ADHD often have difficulty sustaining attention in tasks, make frequent careless mistakes, have difficulty following through on instructions, and are easily distracted by extraneous stimuli. The symptoms of ADHD often lead to decreased productivity, increased off-task behavior in the classroom, and poor academic achievement.

Psychostimulant drugs have been the most common form of treatment for ADHD over the past 30 years (Pelham & Hinshaw, 1992). Among stimulant medications most often prescribed are methylphenidate (Ritalin, Concerta, Metadate) and amphetamine (Adderall, Adderall XR) with approximately 80-90% of children responding favorably (Pelham et al., 1998). Children benefitting from pharmacological treatment will exhibit relatively normalized behavior with decreased aggression and hyperactivity and increased compliance. The main effects of these stimulants on behavior, however, are limited to the three to seven hours that they are active in the body (Pelham et al., 1993). Some newer extended release medications (Concerta, Adderall XR, Metadate) are longer acting and their effects may last up to twelve hours. Side effects from these drugs may include decreased appetite, stomach aches, elevated heart rate, and insomnia, although most children tolerate the medication quite well (Anastopoulos et al., 1996). Although medication has proven to be beneficial in the treatment of ADHD, studies on the use of stimulant medication alone have not reported an improved long-term prognosis. Research suggests that a combination of both psychostimulants and behavioral interventions may be the most effective treatment for managing ADHD in the classroom (Carlson, Pelham, Milich, & Dixon, 1992; Pelham et al., 1993; Abramowitz, Eckstrand, O'Leary, & Dulcan, 1992). The following review will highlight classroom interventions including rewards, reprimands, token economies, punishment, and home-based reinforcement.

Classroom Interventions

There have been many educational and behavioral interventions designed to increase appropriate behavior and academic performance in ADHD children (Abramowitz & O'Leary, 1991). Both accelerative and reductive interventions have proven effective. Common accelerative interventions in the classroom include praise, tangible rewards, and privileges. Frequently implemented reductive measures include ignoring, time-out, reprimands, and removal of privileges or rewards in a response cost system.

Time-out refers to a period of time in which the student has no positive reinforcement, social or tangible, available to him. In one study, time-out effectively reduced the disruptive classroom behavior in three of the four ADHD participants (Northup, Fusilier, Swanson, Huete, Bruce, Freeland, Gulley, & Edwards, 1999). Disruptive behavior was defined as being out-of-seat, vocalizing, and playing with objects. Each occurrence of these behaviors was followed by a 30 second time-out in which the child's chair was turned away from the rest of the group. At the end of the 30 seconds, the chair was turned back and he was allowed to continue participating in the activity. Time-out was implemented to the seven and eight-year-old boys in two conditions, on their prescribed dose of methylphenidate medication and on a placebo. Disruptive behavior was reduced to zero or near zero levels in three of the four children both with and without their regular medication.

Time-out in the classroom typically requires the child to remain quiet and cooperative throughout the duration of the time-out in order to be released. This process can be time consuming for the teacher, taking her attention away from the other students in the classroom, making time-out an inefficient intervention for punishing misbehavior (Barkley, 2000).

Research has consistently shown that positive consequences alone are not sufficient to maintain the desired behavior of ADHD children (Forehand, 1987, Acker & O'Leary, 1987; Pfiffner & O'Leary, 1987; Rosen, O'Leary, Joyce, Conway, & Pfiffner, 1984). These studies suggest that both positive and negative consequences are necessary to achieve optimal levels of appropriate classroom behavior. For example, Rosen et al (1984) compared the use of positive consequences in the form of teacher praise, negative consequences in the form of reprimands and loss of privileges, and a combination of both in a classroom of ADHD children. Percentage of time spent on-task was measured. The results indicated that positive reinforcement was ineffective in controlling behavior when not paired with negative consequences. The children remained on-task between 65 and 85% of the time when negative consequences were being used,

either with or without positive consequences. However, when negative consequences were removed from the intervention, on-task behavior decreased to below 45% of the time.

The use of teacher reprimands is a common punishment technique in classrooms that may be paired with positive reinforcement to increase its effectiveness. Acker and O'Leary (1987) explored the importance of reprimands and praise implemented at the beginning of the school year. The researchers hypothesized that positive attention, such as teacher praise, would be important at the start of the school year while the teacher and students are establishing rapport, and would lead to appropriate classroom behavior of children with behavioral difficulties such as hyperactivity. However, the results showed that reprimands alone lead to high levels of on-task behavior. The addition of teacher praise did not produce significant increases in appropriate behavior.

In a classroom of hyperactive males, Rosen et al (1984) conducted several studies assessing the effects of positive and negative consequences on classroom behavior. Positive and negative consequences provided were varied in order to decrease hyperactive and disruptive behavior. Positive consequences included hugs, smiles, and verbal praise. Negative consequences involved disapproval of the specific behavior and either a reprimand or loss of recess time. The negative consequences were found to be necessary for maintaining appropriate behavior. The presence or absence of the positive consequences had no significant effect on the rate of appropriate behavior, assuming the negative consequences remained in place.

Pfiffner and O'Leary (1987) found that positive consequences alone were not effective in decreasing off-task academic behavior in elementary students with behavioral problems. The researchers manipulated the consequences delivered by the teacher (regular or enhanced positive consequences either alone or coupled with reprimands). Without the negative consequences, or reprimands, in place, neither of the positives, regular or enhanced, were able to decrease off-task behavior.

Abramowitz, Eckstrand, O'Leary, & Dulcan (1992) examined the effects of reprimands, methylphenidate, and their combination on the off-task behavior of three 10 and 11 year old boys with ADHD. The boys' off-task behavior was significantly reduced with the use of reprimands. In fact, the reduction in off-task behavior produced by reprimands alone was equal to the reduction produced by the stimulant medication.

Calm, firm, consistent reprimands appear to be superior to emotional or delayed reprimands (Abramowitz & O'Leary, 1991). Also, Van Houten et al (1982) add that a teacher may increase a reprimand's effectiveness through the use of eye contact, close proximity, and grasping the student's shoulders. Short reprimands appear to be more effective than longer ones (Abramowitz, O'Leary, & Futersak, 1988). Abramowitz and O'Leary (1990) have found that reprimands lose a significant amount of effectiveness when delayed beyond two minutes following the occurrence of off-task behavior, suggesting that timing may be the most important element of delivering useful reprimands.

Reprimands are easy to administer and, as illustrated by these studies, effective in modifying and maintaining appropriate classroom behavior. Reprimands have consistently been found to be effective regardless of the presence or quality of positive consequences. Reprimands are clearly a form of punishment that can be implemented quickly and effectively by teachers in the classroom.

Many classrooms contain token economies have been designed to reward students for appropriate behavior. Tokens, points, or chips may be earned for good behavior and redeemed for tangible rewards such as candy and prizes or privileges such as extra recess time or playing a special game (Barkley, 2000). Early studies showed dramatic increases in appropriate behavior with the implementation of token systems in the classroom (O'Leary & Becker, 1967). Token economies have been created for several individuals in a classroom, as well as whole-classroom systems. More recently, response cost components have been added to token systems (McGoey & DuPaul, 2000, Kerr & Nelson, 1983; McLaughlin & Williams, 1988).

Response cost is another classroom intervention that has been shown to be effective in managing classroom behavior (Kerr & Nelson, 1983; Witt & Elliot, 1982). Response cost has been defined as a punishment procedure which involves the loss of positive reinforcement (privileges, points, rewards) contingent on misbehavior or failure to meet specified behavioral or academic criteria (Abramowitz & O'Leary, 1991). Conditioned positive reinforcers may be removed in response to inappropriate behavior. Tokens, smiley faces, points, and colorful slips of paper may be exchanged for backup reinforcers that may vary widely depending upon the setting. It is important to select the specific reinforcers based on the individual preferences of the students.

In one study (Salend & Henry, 1981), a free token response cost system was developed to decrease inappropriate behavior in two mainstreamed learning disabled students. Each was given strips of colored paper taped to his desk at the beginning of class. The teacher removed a strip every time the student behaved inappropriately. If the number of strips remaining at the end of class met criteria, they could be exchanged for rewards. Inappropriate behavior was significantly reduced in both subjects.

Witt and Elliot (1982) developed the response cost lottery, based on group contingencies. Three fourth-grade students were given different colored strips of paper at the beginning of each session. Violation of a classroom rule resulted in the loss of a strip. The remaining strips were placed in a box for a lottery drawing at the end of each week, and the student whose slip was drawn was allowed to choose a reward. The teacher emphasized that following the rules and maintaining the strips would increase the chance of winning the lottery. Not only did the intervention increase on-task behavior and academic performance, the response cost lottery also minimized the amount of time and resources required of the teacher.

McGoey and DuPaul (2000) used a response cost intervention to reduce the disruptive behavior of four preschoolers with ADHD. Each child had a given number of buttons on a display chart at the beginning of each classroom activity. A button was removed by the teacher every time a classroom rule was broken.

At the end of the day the remaining buttons were exchanged for rewards if the number met the established criteria.

Response cost procedures also have been effective in increasing classwork performance in ADHD students. Carlson, Mann, and Alexander (2000) increased arithmetic accuracy in 40 children with ADHD using a response cost intervention. Results showed that the procedure also promoted intrinsic motivation in the students.

A review of the existing literature suggests that combining punishment of misbehavior with the opportunity to earn positive reinforcement may create the most effective form of intervention for inappropriate behavior of ADHD children in the classroom (Rosen et al., 1984). Teachers would benefit from a quick, simple way to enforce negative consequences and provide positive reinforcement. Unfortunately, very little research has been done on the effectiveness of classroom interventions using samples that include ADHD children from minority groups. This is reflected in evidence that has found that certain ethnic minorities, such as African-American children, may be less likely to be treated for ADHD than Caucasian children (Zito et al., 1998).

Home-based Treatment for Academic Problems

Barkley (2000) stresses the importance of parent involvement in the management of the academic performance of ADHD children. Home-based behavioral interventions include teaching parents how to deliver time-out, the use of token economies, and contingent attention (Pelham & Hinshaw, 1992). Academic interventions in the home include homework routines, goal setting and contingency contracting for homework (Miller & Kelley, 1994), and response cost and positive reinforcement contingent on academic performance (Rosen et al., 1990; Karkaker, 1972).

Grolnick et al. (1997) note that parents' involvement in their children's academic career is associated with children's success in school. Research has identified lower income, less educated (Hoover-Dempsey,

Bassler, & Brissie, 1992), and single parents (Grolnick et al, 1997) as less involved in their children's schooling than more educated, higher income, or married parents. A study by Chase-Landsdale, Michael, and Desai (1991) found that when circumstances are difficult in a family, mothers are more likely to withdraw resources from their boys than from their girls; that is, male children are more likely to have decreased parental support when the family is enduring hardships than female children. This has serious implications for children with ADHD due to the high prevalence in males.

Parent Involvement in Disadvantaged Families:

Moles (1993) has noted that a positive working relationship between home and school is particularly important for children of disadvantaged parents. Unfortunately, as noted by Menacker et al. (1988), there is a widespread lack of parent-school communication in low-income and minority populations. Moles has defined disadvantaged parents as "those who experience social or economic limitations to full participation in American society" (1993, p.21), including blacks, low income families, and poorly educated parents. Teachers often have problems with disadvantaged parents not responding to contact attempts, missing school meetings, and not following through with recommendations. These behaviors can lead to the assumption that the parents are unwilling or unable to work with the school to identify problems and create solutions (Raffaele & Knoff, 1999).

Raffaele and Knoff (1999) have identified several reasons that underlie the lack of parental support from disadvantaged families. Parents might have experienced personal academic failure and do not trust school personnel, might be unsure of what they have to offer towards their child's education, or might feel disempowered by the bureaucracy in the school. Another barrier to this collaboration involves disadvantaged parents lacking sufficient communication skills to collaborate with teachers and other school officials (Moles, 1993).

Importance of Parent Teacher Communication:

Parents have an important role in their children's education, and home-school communication has been shown to lead to better educational outcomes (Christenson & Conoley, 1992). One way to facilitate such a relationship is to involve both parent and teacher in home-based interventions for classroom problems.

School-Home Notes

A school-home note is a home-based classroom intervention that allows parents to receive daily feedback of their child's behavior in school. Notes are completed and sent home daily by the teacher. The notes contain information rating the student's performance on that day. Parents are responsible for providing rewards for the child's appropriate behavior. Home-based intervention has many advantages over school-based intervention. School-home notes provide increased communication between parent and teacher and encourage greater parent involvement. School-home notes allow parents to offer powerful reinforcers that may not be available to teachers at school. Also, school-home notes are a quick and simple intervention, making them more likely to be utilized by teachers. The use of the note relieves teachers of the duty to discover effective reinforcers for the students, and puts the responsibility on the parents of each individual student. The simplicity, ease, and non-time-consuming nature of school-home notes are valuable advantages of this home-based intervention.

Kelley (1990) offers general guidelines for the application of school-home notes. Parents and teachers should be trained in the use of basic contingency management procedures. Specific target behaviors that are relevant and socially valid should be selected and stated positively. It was originally recommended that academic productivity be targeted. However, Kelley (1990) suggests that classroom behaviors may also be targeted. The note should evaluate behavior during several different time intervals throughout the day, giving frequent, time-specific feedback about student performance. This allows parents and teachers to

monitor generally troublesome times during the school day. Parents, students, and teachers should collaborate when developing performance goals and appropriate reinforcement.

The majority of school-home note interventions require that parents positively reinforce any good notes that are brought home. Typically, parents are not instructed which specific reinforcers to utilize, but common suggestions in the literature include: special snacks, TV time, late bedtime, verbal praise, and freedom from chores (Heaton et al., 1976; Taylor et al., 1984; Schumaker et al., 1977). The effectiveness of parent-provided positive reinforcement in school-home note interventions has been well documented.

Ayllon et al (1975) used a “Good Behavior” daily report card targeting disruptive behaviors including out-of-seat, vocalizations, and any motor activity that interfered with the other students’ studying in a third grade classroom of 23 children. Parents provided appropriate rewards on days the child’s behavior warranted a “Good Behavior” letter. The average level of disruption decrease from 90% during baseline to zero during the treatment phase.

Researchers also have targeted academic performance using school-home note communication (Blechman, Taylor, & Schrader, 1981; Blechman, Kotanchik, & Taylor, 1981). For example, Blechman, Taylor, and Schrader (1981) used a “Good News Note” to decrease inconsistency of math class work in a group of elementary students with inconsistent math performance. Teachers sent a note home on days the student’s math performance equaled or exceeded performance during baseline. Parents delivered positive reinforcement on days the child received a “Good News Note.” The note significantly increased consistency in math performance.

The use of negative consequences in school-home notes for inadequate performance has not yet been investigated thoroughly, although several studies suggest that a response cost component would be a beneficial addition to school-home note systems (Kelley & McCain, 1995; McCain & Kelley, 1994). McCain and

Kelley (1994), for example, compared the effectiveness of a school-home note with and without response cost in improving the classroom performance of three preadolescents. On-task (oriented towards work), off-task (not oriented towards work), and disruptive behaviors (out of seat, making noise, other teacher disapproved behaviors) were targeted. Parents were instructed to reward good notes with positive reinforcement according to a contract that outlined contingencies for reinforcement. In addition, the school-home notes with response cost required that parents provide consequences contingent on satisfactory on-task behavior and minimal loss of response cost points. The addition of response cost increased the effectiveness of the intervention beyond the traditional school-home note without response cost. All three students showed decreases in off-task behavior and exhibited low, stabilized levels of disruptive behavior during the response cost intervention as compared to the traditional school-home note.

Kelley and McCain (1995) found similar results in a study that compared the effectiveness of a school-home note with and without response cost for increasing academic productivity and appropriate classroom behavior in five elementary-aged children. Both notes included the target behaviors “Completed Classwork Satisfactorily” and “Used Classtime Well.” Teachers rated each behavior as “yes,” “so-so,” or “no.” Notes were taken home and parents provided rewards contingent upon satisfactory behavior. The note used during the response cost condition had the addition of five smiley faces on the page. Teachers instructed students to mark off a smiley face every time they were off-task or behaved disruptively. Notes were taken home and rewards were provided contingent upon satisfactory behavior ratings as well as minimal loss of smiley faces. Both appropriate classroom behavior and academic productivity increased in all five children with the use of school-home notes. In three of the subjects, the inclusion of the response cost component lead to significantly greater improvement in classroom behavior over the traditional school-home note.

In summary, school-home notes have been shown to be effective (Kelley & McCain, 1995; McCain & Kelley, 1994; McCain & Kelley, 1993; Ayllon et al., 1975; Rosen et al., 1990; Blechman et al., 1978; Schumaker et al., 1977). Various aspects of school-home notes such as target behaviors, consequences, and age of subjects have been varied in the literature without diminishing effectiveness. Home-based contingency interventions have been effective in increasing both academic performance and appropriate classroom behavior. These findings as well as the advantages of parent involvement in their children's classroom behavior make school-home notes an important behavior modification intervention for use in educational settings. Unfortunately, these studies have been limited to certain populations of children. The use of school-home notes with both ADHD and disadvantaged students has not been adequately studied; however, the existing research suggests that both may benefit from the use of a school-home note intervention.

Treatment Acceptability

Researchers have begun to explore how acceptable school-home note and response cost interventions are to parents and teachers. Kelley and McCain (1995) asked mothers, teachers, and children to rate the acceptability of school-home note interventions with and without response cost using the Intervention Rating Profile-15 (IRP-15; Martens & Meller, 1989) for adults and the Children's Intervention Rating Profile-15 (CIRP-15; Witt & Elliot, 1982) for students. The mothers rated both notes as more acceptable than the teachers, although both teachers and mothers preferred the response cost note over the no response cost note before and after treatment. The children did not prefer either note before treatment; however, most rated the response cost note as more acceptable posttreatment. In another study (Pisecco, Huzine, & Curtis, 2001), teachers rated daily report cards, response cost techniques, classroom lotteries, and medication on their acceptability for treating children with ADHD. The daily report card was preferred to all other interventions.

Power et al. (1995) asked elementary and middle school teachers in a middle class community to rate the acceptability of psychostimulant medication, a daily report card, and a response cost procedure for treating students with ADHD. The teachers read a description of a child with ADHD and three vignettes describing each of the interventions. The daily report card intervention involved the teacher rating the child's performance twice a day and providing rewards if the child reached the established goal. The response cost procedure required that the teacher remove a point at every occurrence of an unwanted behavior. A portion of a daily reward was lost for each point that was taken away. The daily report card was rated as significantly more acceptable than the other interventions. Teachers also rated medication as more acceptable when it was combined with either the daily report or the response cost technique than when it was used in isolation.

Studies investigating the treatment acceptability of home-based reinforcement have targeted mainly middle class children. Treatment acceptability of school-home notes has not been sufficiently studied in disadvantaged students with ADHD. It is possible that a school-home note could provide disadvantaged parents with the parent-teacher communication necessary to get them involved in their children's education.

STUDY RATIONALE

Home-based rewards through the use of a school-home note have proven to be effective interventions to increase classwork completion and appropriate classroom behavior. Research has demonstrated that reductive measures are also an important component of behavior modification interventions aimed at increasing these behaviors. However, some studies suggest that the reductive measures are not always necessary. The purpose of this study is to determine if the effectiveness of home-based reinforcement can be strengthened by adding a response cost component. This study will examine treatment effectiveness in a group of disadvantaged elementary students with ADHD, a population that has not been thoroughly evaluated using school-home notes.

HYPOTHESES

1. Both school-home note interventions will lead to increased on-task behavior and decreased disruptive behavior. Of the two school-home notes, the note that includes the response cost component will lead to greater increases in on-task behavior relative to the school-home note without response cost.
2. Both school-home note interventions will lead to increased classwork completion.
3. Teachers and parents will evaluate both school-home notes as effective, easily implemented, and highly acceptable treatments. Both treatments will be evaluated as more acceptable post treatment relative to pre treatment scores. Of the two interventions, the note that includes the response cost component will be evaluated more favorably by teachers and parents relative to the note without response cost.
4. Parents will consistently review the school-home note and provide appropriate consequences to their child daily.

METHOD

Subjects

Six first and second graders participated. Criteria for participation included: 1) teacher referral for problematic classroom behavior, 2) a diagnosis of ADHD, 3) significant levels of off-task behavior during baseline, 4) average scores on the Woodcock-Johnson Test of Achievement-Third Edition, 5) member of a minority population, and 6) attending an inner-city school. Children were selected from a pool of teacher referrals from an inner-city, East Baton Rouge Parish elementary school.

The study was advertised to all first through third grade teachers in the school during several visits made by the researcher. Two teachers decided to participate, and each sent notes home and called the parents of students who they were having substantial behavioral difficulties with. Those parents interested were instructed to call the researcher. Approximately half of the parents who received notes and calls from their child's teacher contacted the researcher. Of the seven families who contacted the researcher, all initially agreed to participate in the study. One child dropped out of the study during the baseline phase after being put on psychostimulant medication.

Charles

Charles was an 8-year-old African-American male repeating first grade. His teacher reported high levels of off-task behavior, poor work completion, constant fidgeting, and frequently disturbing others in the classroom. Charles's parents described him as a compliant, but inattentive child.

Lauren

Lauren was a 6-year-old African-American female attending first grade. Her teacher indicated that she rarely completed classwork or followed directions, was defiant, and had trouble remaining still and quiet in class. Her parents agreed that Lauren frequently exhibited noncompliant and impulsive behavior.

Jerry

Jerry was an 8-year-old African-American male attending second grade. His teacher described him as an extremely inattentive child who was essentially unable to complete assignments or pay attention in class. Jerry was exhibiting hyperactive and impulsive behaviors in the classroom including interrupting, being unable to wait his turn, frequently being out of his seat, and talking out of turn. His mother explained that Jerry is constantly moving and never completes his homework.

Joe

Joe was an 8-year-old African-American male attending the second grade. Joe repeated the first grade last year due to excessive disruptive behavior, according to his mother. His teacher reported that Joe was constantly out of his seat, talking in class, disturbing others, playing with objects in his desk, and never focusing on the lesson. He was exhibiting extremely low rates of on-task behavior and work completion. He had previously been diagnosed with ADHD by a pediatric neurologist at age six.

Steve

Steve was an 8-year-old African-American male attending second grade who had repeated kindergarten. According to his teacher, Steve was extremely inattentive, easily distracted, and unproductive in class. He spent much of classtime fidgeting in his seat and talking to his neighbor.

Maurice

Maurice was a 7-year-old African-American male attending the second grade. His teacher reported problems with inattention and incomplete work. Maurice was described as an easily distracted, restless student who continuously had trouble following directions and waiting his turn.

Diagnosis

All six participants were diagnosed with ADHD based on teacher and parent interview, direct observation, and the following questionnaires completed by the child's parents and teachers: Conners' Parent

Rating Scale- Long Form (CPRS-R:L), Conners' Teacher Rating Scale- Short Form (CTRS-R:S) (Conners, 1997), Achenbach Child Behavior Checklist (CBCL), Achenbach Teacher Report Form (TRF) (Achenbach, 1991), (see Table 1). These questionnaires are empirically based assessment measures of child behavior problems. The technical manuals provide cut-off scores for each of the diagnostic tools that indicate when a child's problems are clinically significant. See Table 1 for each participant's scores. One of the children, Joe, had previously been diagnosed with ADHD by other professionals. None of the others had received any treatment for behavior problems, inattention, or any other psychiatric problems. None of the participants were taking psychostimulant medication during any part of this study.

Setting and Teachers

The intervention was implemented in the classroom of each individual student. The students and teachers were observed in the classrooms of the two teachers who participated in the study. Mrs. May was an African-American first grade teacher with 15 years experience as an elementary teacher. Charles and Lauren were her students. Mrs. Rogers was a Caucasian second grade teacher in her first year of teaching. Her student participants were Jerry, Joe, Steve, and Maurice.

Dependent Measures

Observational Coding System

Student and teacher behaviors were coded using 15-second intervals. The coding system used was a modification of a method used by Pfiffner and O'Leary (1987).

Three categories of student behavior were recorded: on-task, off-task, and disruptive. The dependent measure was percentage of intervals in which the student was on-task. On-task behavior was defined as a full interval in which the student was engaged in appropriate activities.

Observers were undergraduates and post-graduates blind to the purpose of the study. Each observer went through extensive training and practice using the coding system.

Table 1 - Scores on CPRS-L, CTRS-S, CBCL, and TRF

*T-scores above 70 are considered clinically significant.

Charles

CPRS-L: Conners' ADHD Index =	72	CTRS-S: Conners' ADHD Index =	71
CBCL: Attention Problems =	68	TRF: Attention Problems =	80

Lauren

CPRS-L: Conners' ADHD Index =	74	CTRS-S: Conners' ADHD Index =	90
CBCL: Attention Problems =	70	TRF: Attention Problems =	90

Jerry

CPRS-L: Conners' ADHD Index =	63	CTRS-S: Conners' ADHD Index =	76
CBCL: Attention Problems =	65	TRF: Attention Problems =	85

Joe

CPRS-L: Conners' ADHD Index =	71	CTRS-S: Conners' ADHD Index =	75
CBCL: Attention Problems =	70	TRF: Attention Problems =	75

Steve

CPRS-L: Conners' ADHD Index =	71	CTRS-S: Conners' ADHD Index =	66
CBCL: Attention Problems =	85	TRF: Attention Problems =	71

Maurice

CPRS-L: Conners' ADHD Index =	61	CTRS-S: Conners' ADHD Index =	73
CBCL: Attention Problems =	65	TRF: Attention Problems =	75

Completed Academic Assignments

The percent of classwork attempted as well as the percent of work completed correctly during the morning work period was evaluated. The researcher obtained each child's classwork from the "DOL Journal," which contained all morning work, and made copies of each assignment. The copies were graded. Both the teacher and the researcher graded each assignment independently to ensure reliability. The two graders were in agreement 100% of the time. The two dependent measures were the mean percent of problems completed daily and the percent correct.

Treatment Integrity

To ensure that the home-based portion of the intervention was being properly implemented, a treatment integrity measure was used. Parents were required to write the consequences provided for the day's note on the school-home note, sign it, and send it back to school in the child's homework folder. The researcher contacted the parents by telephone if the note was not returned to school.

Treatment Acceptability

The two school-home note procedures used in the study were rated by the mothers, children, and teachers before and after treatment. The measure consisted of a written description of a second grade boy with classroom behavior problems. The child was described as having difficulty paying attention, staying seated, talking with permission, and completing required work. Following the case were written descriptions of the two treatments used in this study (school-home notes with and without response cost) as well as two additional classroom intervention techniques. The school-home note without response cost required the child to take a note home daily which will indicate how well he performed at school. The parents would provide consequences based on acceptable performance. The second treatment description was identical to the first with one addition; the school-home note contained five smiley faces which the child crossed out one at a time when reprimanded by the teacher for inappropriate behavior. The third treatment description explained a time

out procedure in the classroom. The fourth treatment was a system of using positive reinforcement to reward positive behavior.

Treatment descriptions were rated by parents and teachers using the Treatment Evaluation Inventory - Short Form (TEI-SF) (Jones, Eyeberg, Adams, & Boggs, 1998). The TEI-SF includes 9 statements rated on a five-point Likert scale which examine perceptions of the effectiveness and acceptability of classroom interventions.

The students rated the four interventions before and after the study as well. The Children's Intervention Rating Profile (CIRP) (Witt & Elliott, 1985) was completed by each student following the case description and each of the treatment vignettes being read to them by the researcher. The CIRP is a seven question, six-point Likert scale of children's social acceptability ratings.

Design and Procedures

A reversal design with alternating treatments was used in order to compare the effects of a school-home note with and without a response cost for increasing children's on-task behavior and classwork completion. The two interventions were randomized across days throughout treatment conditions.

Intake Interview

Prior to data collection, the parent(s) of each child were interviewed and the purpose of the study was explained. Parents were told that the effectiveness of the two types of school-home notes was being evaluated. Informed consent was obtained (see Appendix). After agreeing to participate, parents were given packets to complete which contained the Conners' Parent Rating Scale- Long Form (CPRS-R:L), Achenbach Child Behavior Checklist (CBCL), Treatment Evaluation Inventory - Short Form (TEI-SF) and a demographic questionnaire. Next, the teachers participated in a more in-depth interview and completed the Conners' Teacher Rating Scale- Short Form (CTRS-R:S), Achenbach Teacher Report Form (TRF), and TEI-SF. During the week following the in-take interview, the child was administered six subtests (Letter-

Word Identification, Reading Fluency, Calculation, Math Fluency, Applied Problems, and Spelling) of the Woodcock Johnson Test of Achievement-Third Edition at school during a non-academic activity such as music or physical education. See Table 2 for each child's scores. At this time the child also filled out the Children's Intervention Rating Profile (CIRP) (Witt & Elliott, 1985). The case description, each treatment vignette, and all items were read to the child.

Baseline

During baseline, teachers were instructed to respond as usual to appropriate and inappropriate classroom behavior. No specific contingencies for altering behavior were implemented. Observers were trained in the Observational Coding System. Observational data was obtained in the morning during "morning work time," which included Daily Oral Language, Daily Oral Math, and Daily Oral Analogies. The observations reflected the students' performance while engaged in independent work. Daily observations were conducted in the classroom for thirty minutes. Observers were located in an unobtrusive position inside the classroom. These observation procedures and setting remained the same throughout all phases of the study.

School-Home Note Without Response Cost

Prior to beginning the school-home note intervention, parents, teachers, and students were instructed in the use of home-based reinforcement during a training session. Handouts explaining school-home notes were provided to teachers and parents. The handouts outlined the steps to setting up a home-based reinforcement system. For example, parents and teachers were trained to define behaviors, set small goals, establish criteria for a "good note," and provide promised consequences.

During the training session, parents and children were shown and told about the two school-home notes. It was explained that one note would be completed by the teacher each day and that the two types of notes would alternate randomly. Then specific instructions for using the note were described step-by-step.

Table 2 - Scores on Woodcock-Johnson Test of Achievement - III

*Percentile ranks and standard scores based on grade norms.

<u>SUBTEST</u>	Charles		Lauren	
	<u>% Rank</u>	<u>SS</u>	<u>% Rank</u>	<u>SS</u>
Letter-Word Identification	85	116	78	112
Reading Fluency	95	125	52	101
Spelling	71	108	73	109
Calculation	94	123	57	103
Math Fluency	87	117	37	95
Applied Problems	51	100	38	95

<u>SUBTEST</u>	Jerry		Joe	
	<u>% Rank</u>	<u>SS</u>	<u>% Rank</u>	<u>SS</u>
Letter-Word Identification	58	103	42	97
Reading Fluency	60	104	28	91
Spelling	40	96	33	93
Calculation	82	114	52	101
Math Fluency	83	114	31	93
Applied Problems	77	111	51	100

<u>SUBTEST</u>	Steve		Maurice	
	<u>% Rank</u>	<u>SS</u>	<u>% Rank</u>	<u>SS</u>
Letter-Word Identification	58	103	39	96
Reading Fluency	22	88	33	94
Spelling	26	90	33	93
Calculation	41	96	82	114
Math Fluency	14	84	75	110
Applied Problems	41	96	77	111

Students were told that the note would be placed on their desk and that the teacher would rate their morning behavior daily. Parents, along with students, were instructed in determining contingencies for reinforcement. Teachers were told to evaluate students at the end of the morning work period on the two target behaviors.

After fully describing the two procedures, a contract was drawn up between parents and subjects outlining contingencies for reinforcement. The contracts were renegotiated several times throughout the study for two purposes. First, renegotiating ensured that the subjects still found the rewards being earned reinforcing. Secondly, renegotiating allowed for the chance to make the requirements for reinforcement more stringent in order to continue shaping the child's performance.

The note was placed on the student's desk at the beginning of the morning work period, approximately 8:30. The note included the target behaviors "Completed Classwork Satisfactorily" and "Used Classtime Well." The teacher rated the student's performance at the end of the morning work session, just before lunch at 11:20, on each of the target behaviors. For each target behavior, the teacher circled either "Yes," "So-So," or "No" to record the student's performance, based on her perceptions of appropriate classroom behavior. A rating of "Yes" was used to indicate that the student behaved within the normal range, "So-So" indicated that the student behaved marginally appropriate, and "No" indicated unsatisfactory behavior. "Yes" was worth 2 points, "So-So" was worth 1 point, and "No" was worth zero points. The note was taken home in the child's homework folder at the end of each day and the parents delivered consequences contingent on that day's performance. Contingencies for reinforcement were specified in the parent-student contract based on which ratings the teacher circled. For example, a student's contract might have specified that 3 points (one "Yes" and one "So-So") must be obtained to receive reinforcement.

Parents were required to review the school-home note with the child daily right before beginning homework in the afternoon. The parents determined if the note was "good" (worthy of a reward) and provided the appropriate consequences as specified by the school-home note contract. The reward obtained

by the child was written on the school-home note, signed by the parent, and sent back to school in the child's homework folder. The researcher contacted the parents by telephone any day that the note was not returned to school.

School-Home Note With Response Cost

During the condition that incorporated response cost, the procedure was identical with one exception. The note with a response cost component contained five smiley faces in addition to the two target behaviors. The response cost was used in conjunction with the target behavior "Used Classtime Well." Teachers were instructed to have the student cross off a face whenever they were off-task or behaving disruptively during the morning work period. Remaining smiley faces were worth 1 point each. On response cost days, students earned rewards for fulfilling the daily contract based on minimal loss of smiley faces and satisfactory teacher ratings on the two target behaviors. For example, a contract may have stated that 5 points (i.e. one "Yes" and one "So-So" plus no more than two smiley faces crossed off) must be obtained to receive reinforcement in this condition.

Follow-up

During follow-up, individual school-home notes were designed for each child target his or her specific problem behaviors. Both teachers were asked to choose between a response cost note and a traditional note for each student. Response cost notes were selected for all participants. The note was used daily, and feedback was given to the parents during a telephone conversation at the end of each week.

Reliability

Reliability data were collected for 20% of the sessions. Observers achieved an average of 96% inter-rater reliability for coding on-task behavior during training sessions and while taking reliability data (Range 92-100%)

RESULTS

On-Task Behavior and Academic Productivity

Charles

Figure 1 shows the percent of intervals Charles was recorded as being on-task. During baseline Charles's on-task behavior was relatively variable across observations and averaged 44%. During the first treatment phase, his on-task intervals increased to a mean of 83%. Charles's average percent on-task during treatment days using a no response cost note was 75%. His average on days with a response cost note was 88%. The reversal probe resulted in almost immediate decreases in Charles's on-task behavior ($x=61\%$). However, his on-task percentage quickly increased with the reapplication of treatment in the last phase of the study. His overall average was 87% with an 87% mean on both days with and without response cost notes. The two treatment conditions both resulted in substantially increased levels of on-task behavior for Charles. Thus, the effects of the two notes did not appear to be significantly different.

Figure 2 presents the percentages of classwork attempted and completed correctly by Charles during each phase of the study. Many times the children were allowed to finish work not completed within the allotted time on the following day. For this reason it was impossible to measure the amount of work completed during each note when treatment conditions alternated while a child was still working on an assignment. Inspection of the data reveals that during baseline low rates of work were attempted ($x=72\%$) and completed correctly ($x=61\%$). During treatment, the percentage of work attempted increased to 98% and completed correctly to 92%. The return to baseline did not see any significant drop in classwork performance as Charles completed 100% of his morning work and was correct on 93% of it. The reintroduction of treatment did not change the percentages either. Charles completed all of his work (100%) and was correct on 99% of the items.

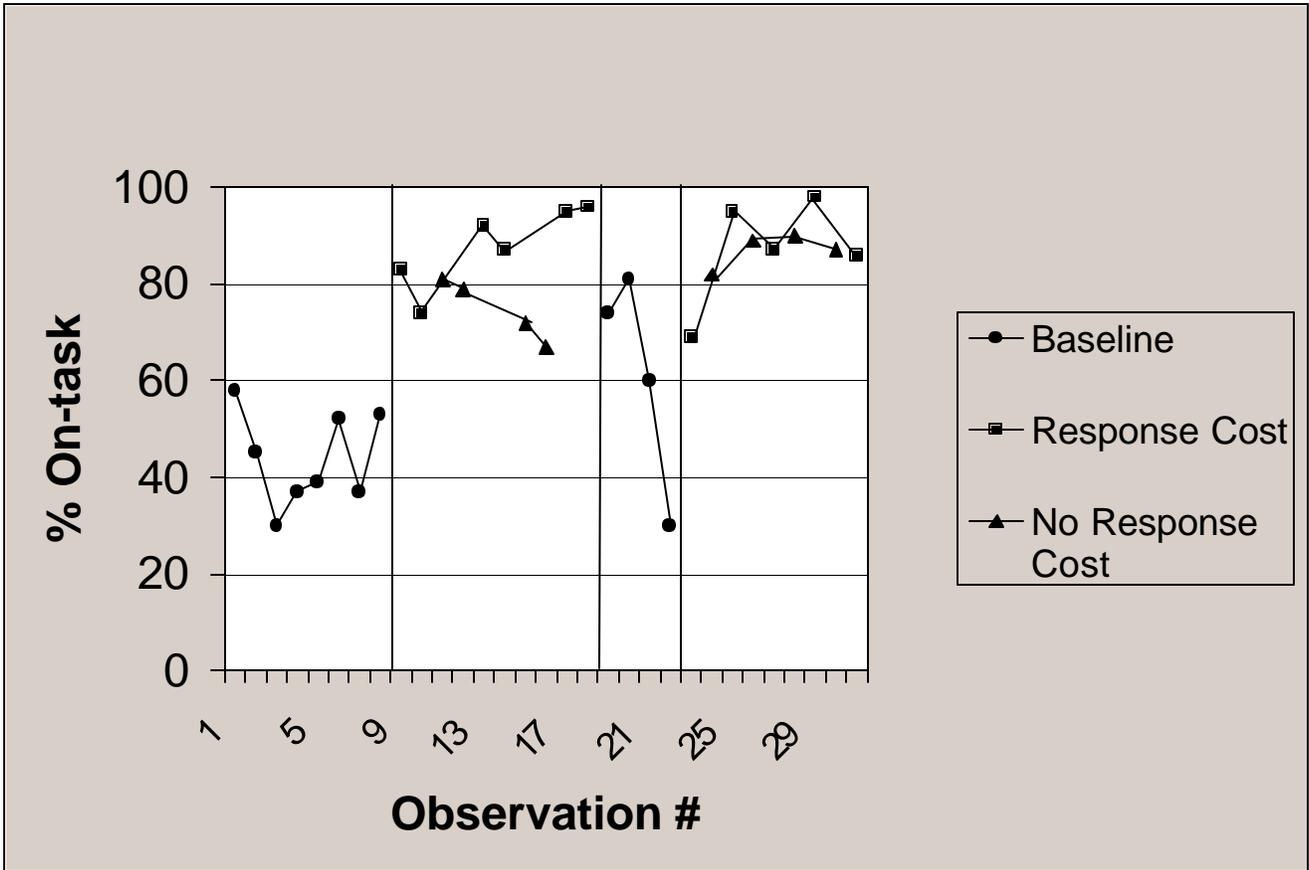


Figure 1: Charles's On-task Behavior

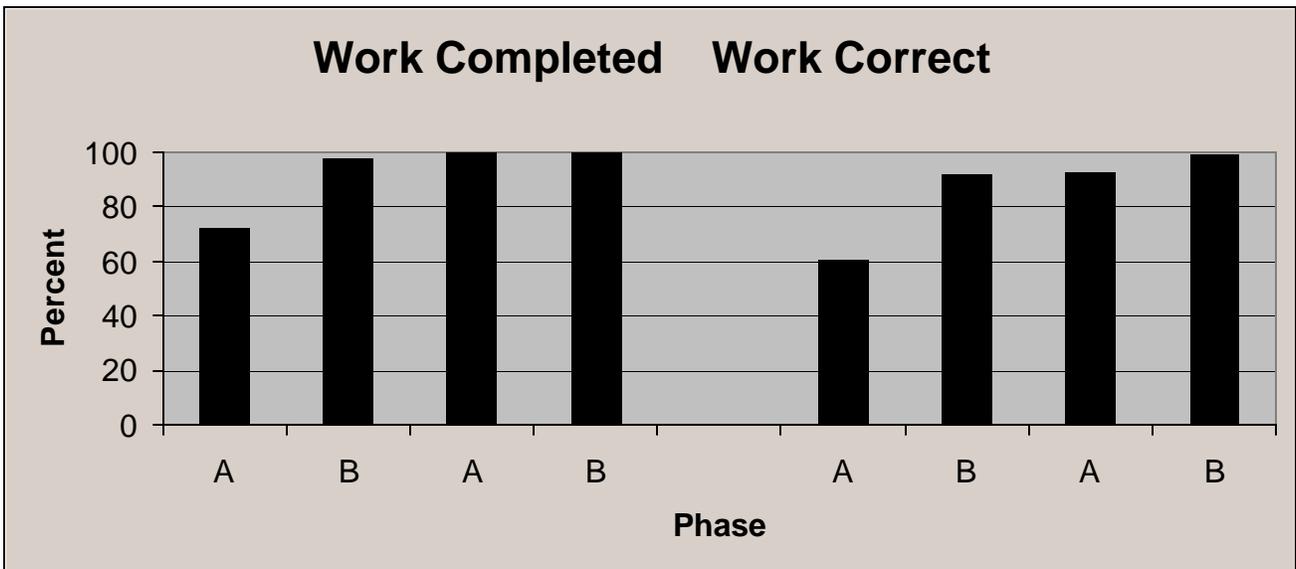


Figure 2: Charles's Academic Productivity

Lauren

As seen in Figure 3, Lauren's level of on-task behavior during baseline, which was extremely variable across days, averaged 46%. This performance showed equal levels of improvement across both school-home notes ($x=80\%$). During the short return to baseline, Lauren's on-task behavior decreased to 53%. With the reintroduction of the notes, on-task rose to an overall average of 78%, again with equal levels during both conditions. It should be noted, however, that Lauren's behavior during the no response cost note was more consistent than during the response cost note.

Figure 4 presents the percentages of classwork attempted and completed correctly by Lauren during each phase of the study. The data reveal that during baseline low rates of work were attempted ($x=69\%$) and completed correctly ($x=60\%$). During treatment, the percentage of work attempted increased to 96% and completed correctly to 87%. The return to baseline did not see any drop in performance as Lauren completed 100% of the work assigned in her DOL journal and was correct on 90% of it. The reintroduction of treatment did not change the percentages either. Lauren completed all of her work and was correct on all items.

Jerry

Figure 5 shows the percent of intervals during each observation that Jerry was on-task. During baseline, he averaged 39% on-task. With the introduction of the school-home notes, his percentage increased to 87%. The no response cost condition rendered slightly greater increases in on-task behavior ($x=91\%$) than the response cost note ($x=86\%$). The note was removed and Jerry was returned to baseline for one observation during which he was only 8% on-task. When the note was reintroduced, his percentage instantly increased to an overall average of 87%, equal to his average in the first treatment phase. He was on-task 96% of the time with the no response cost note and 82% of the time with a response cost note. Again showing a possible additive effectiveness of the no response cost note.

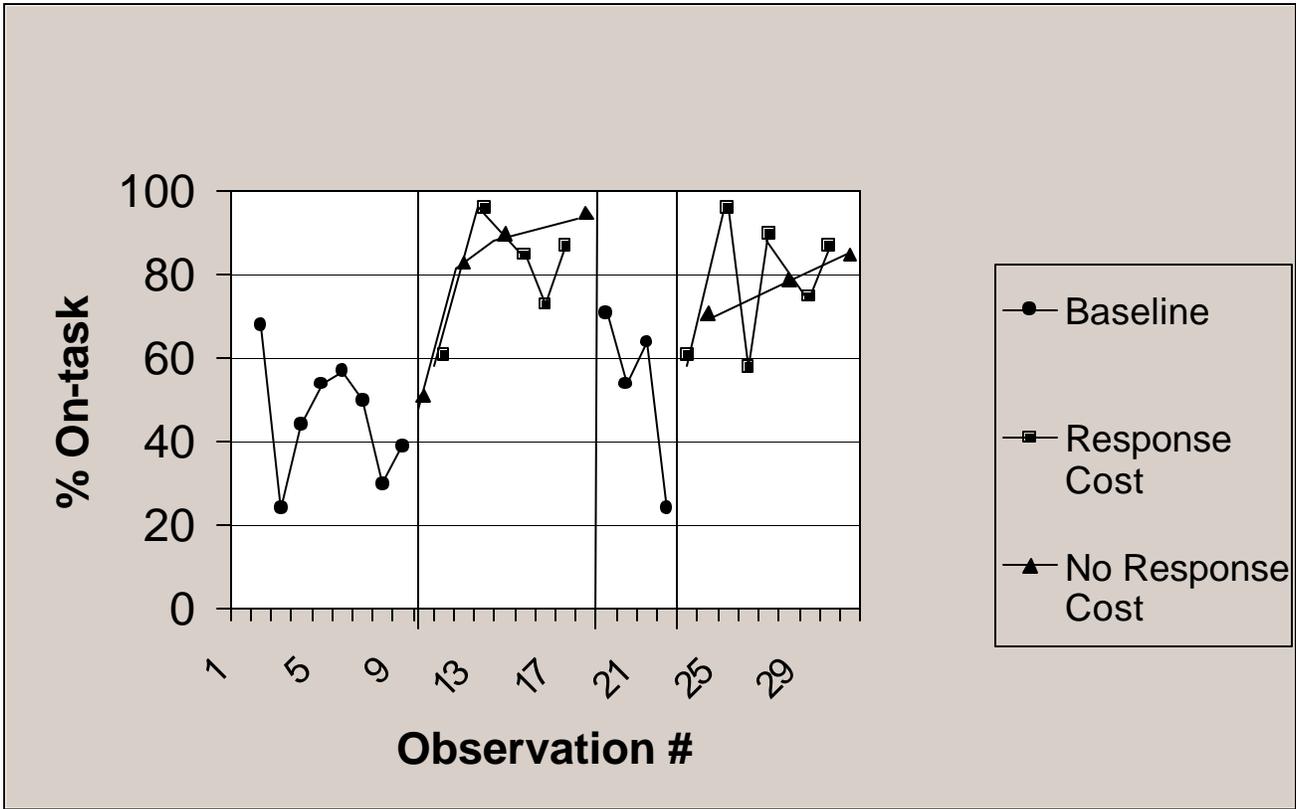


Figure 3: Lauren's On-task Behavior

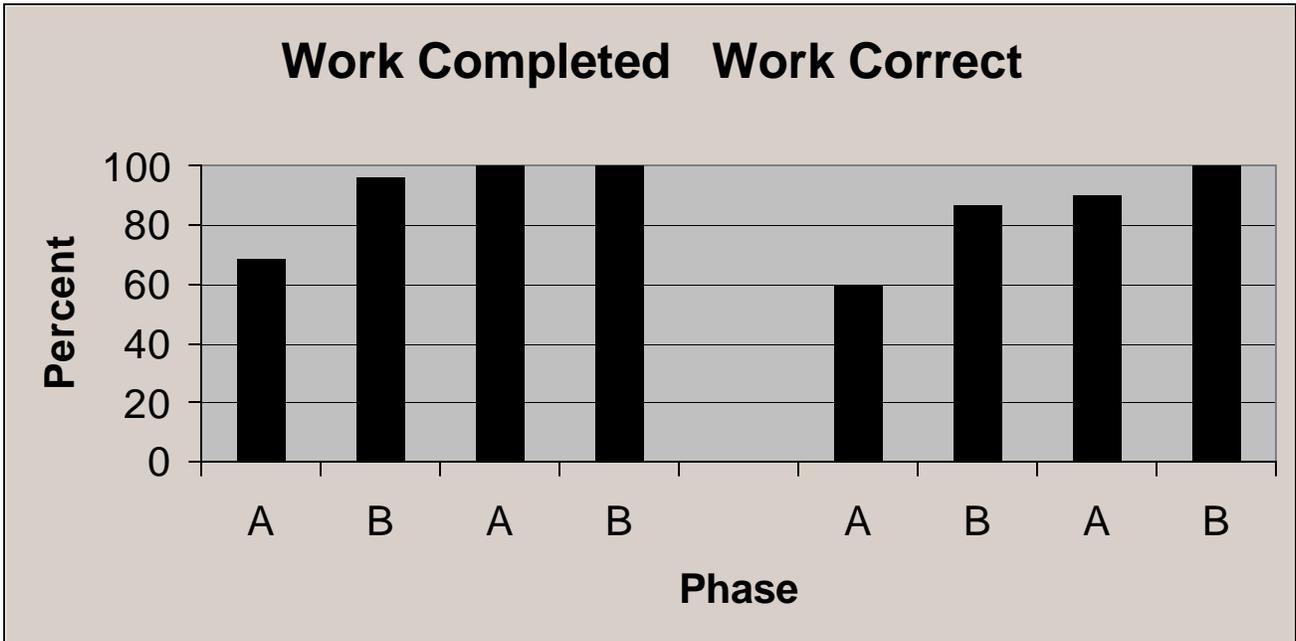


Figure 4: Lauren's Academic Productivity

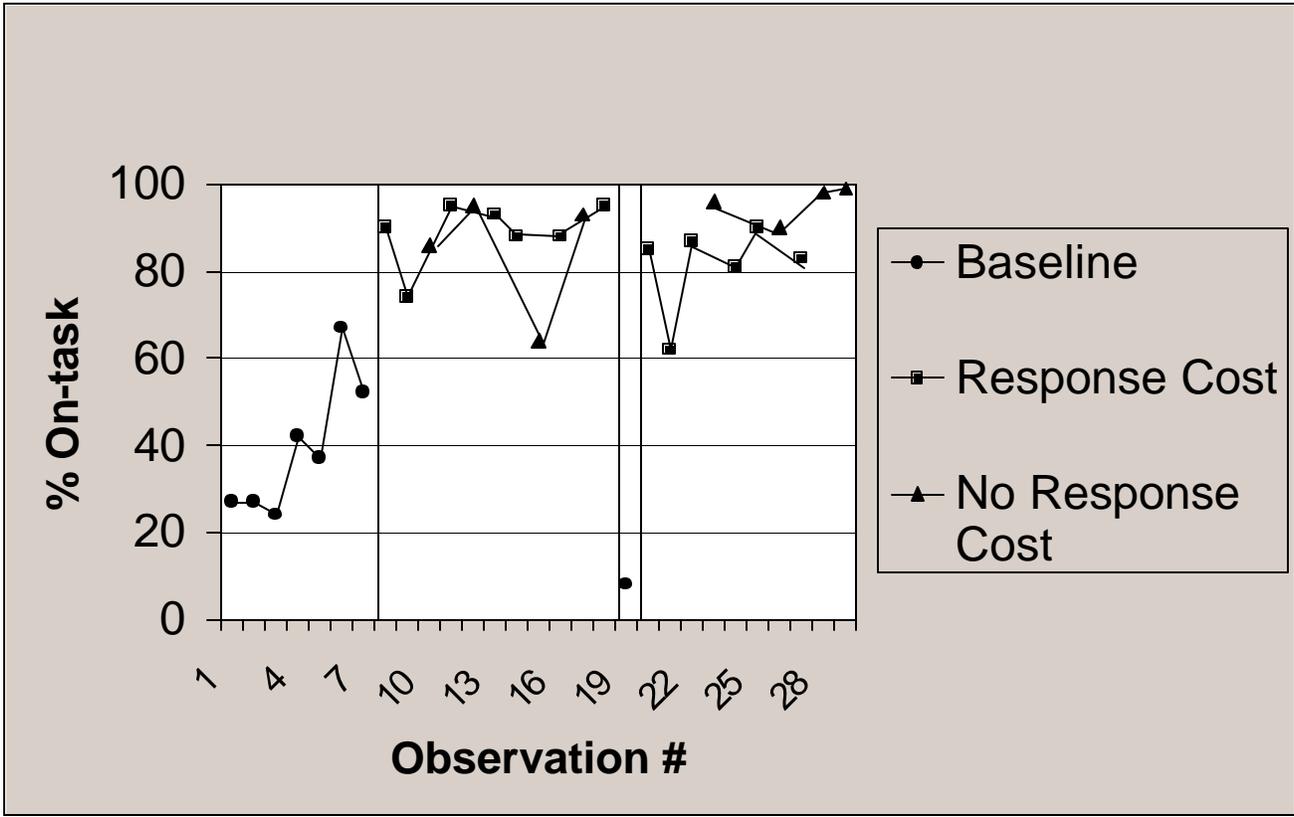


Figure 5: Jerry's On-task Behavior

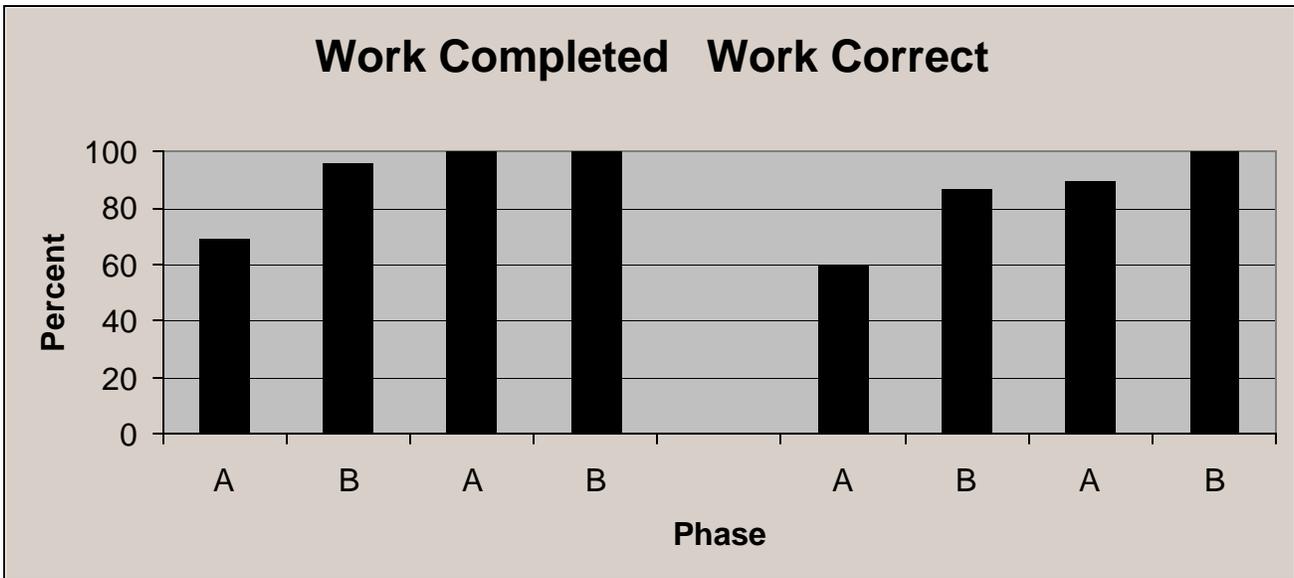


Figure 6: Jerry's Academic Productivity

Jerry's percentages of work completed and work accurately completed are shown in Figure 6. His classwork completion began very low with an average of 63% during baseline and only 35% correct. With the implementation of treatment, Jerry completed 100% of his work and did so correctly 92% of the time. The short reversal resulted in a drop in performance as he only completed 80% of his assignment and was only 63% correct. The return to treatment saw great increases in both completion (x=100%) and accuracy (x=96%).

Joe

Joe's on-task behavior, seen in Figure 7, was extremely low initially (x=37%). His average increased during treatment (x=77%), although his on-task behavior was quite variable across days (range=31-99%). No difference was seen in the effectiveness of the two notes. The reversal probe showed decreases in Joe's on-task levels (x=49%), although it was variable (range=23-95%). Joe remained in the reversal for quite a while because his behavior did not stabilize. The last two days of the study Joe was returned to treatment and was on-task 98% with a response cost note and 100% with a no response cost note.

Joe's work completion (see Figure 8) revealed more clear-cut efficacy of the intervention. He was completing an average of 37% of his morning work during baseline with only an average 26% of it correct. During treatment, Joe's average of work completed rose to 100% and his accuracy rose to 96%. The return to baseline showed a slight drop in completed work (x=89%) and correct work (x=82%). The two days of Joe's second treatment phase he completed 100% of his work and was 100% correct.

Steve

As seen in Figure 9, Steve was on-task an average of 43% during baseline. The first treatment phase showed a significant increase to 90% on-task with 90% and 91% during the no response cost and response cost conditions, respectively. Steve's percentage plummeted in the second baseline phase to

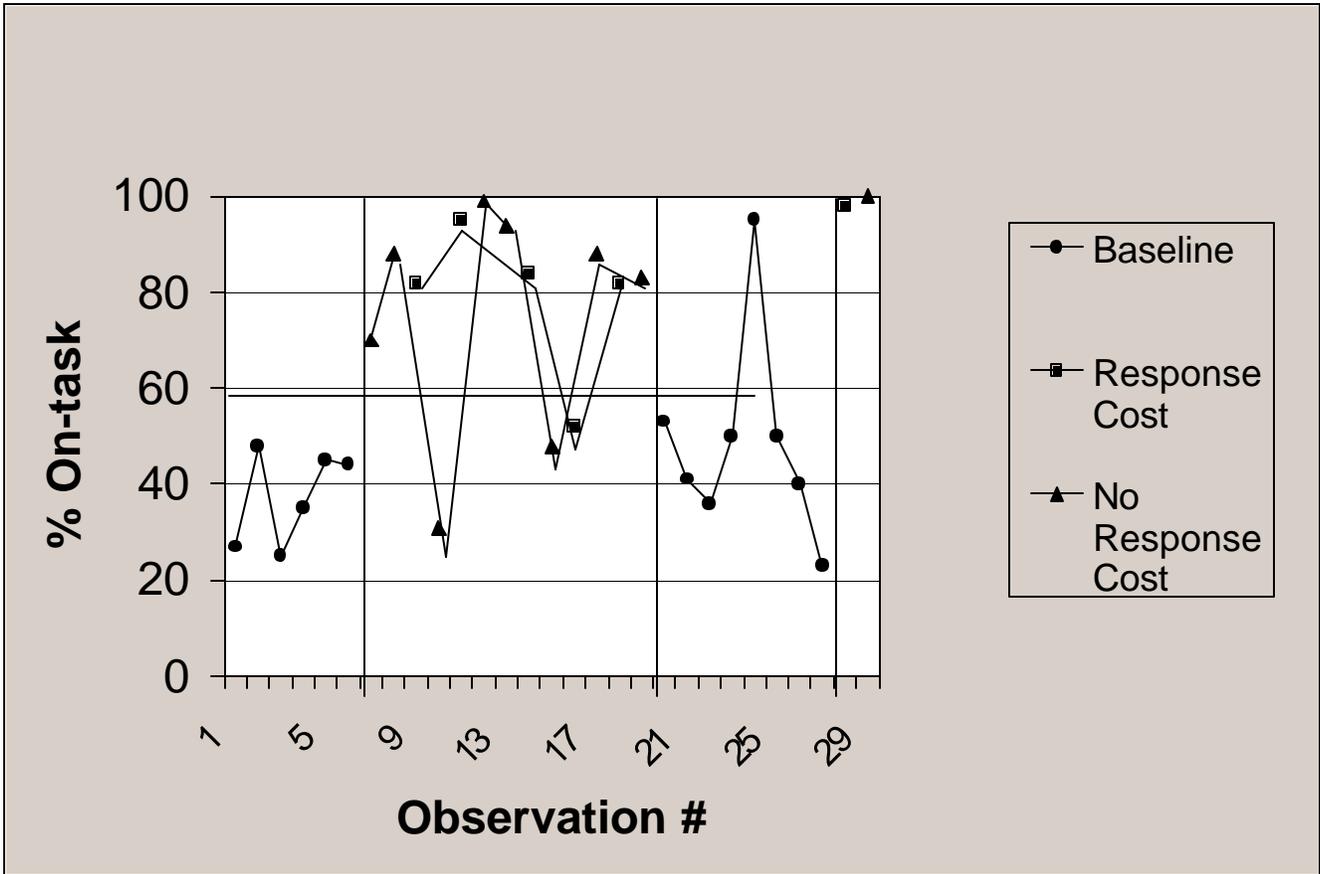


Figure 7: Joe's On-task Behavior

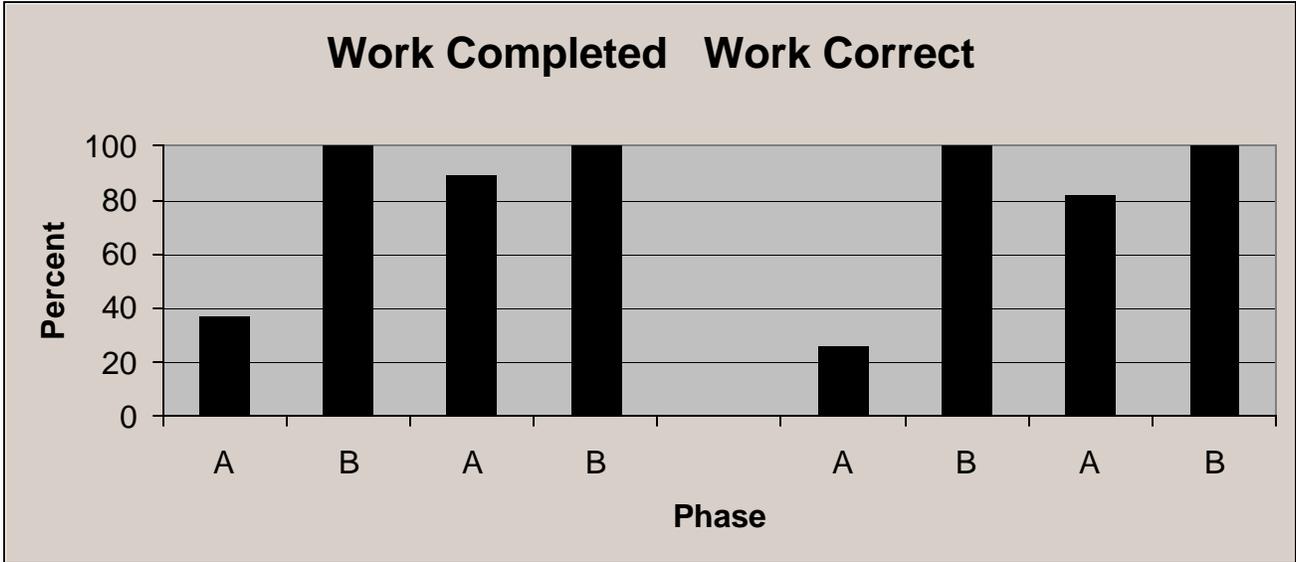


Figure 8: Joe's Academic Productivity

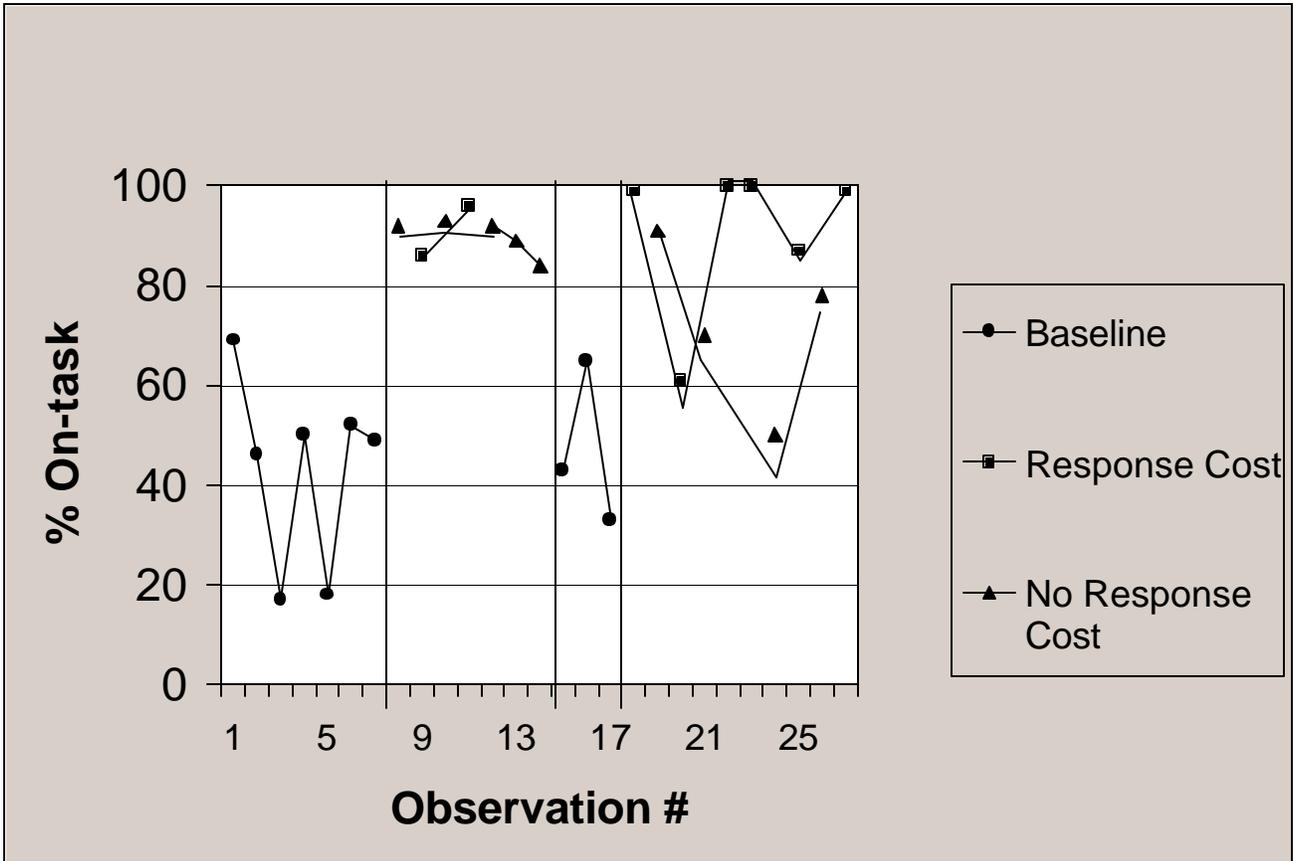


Figure 9: Steve's On-task Behavior

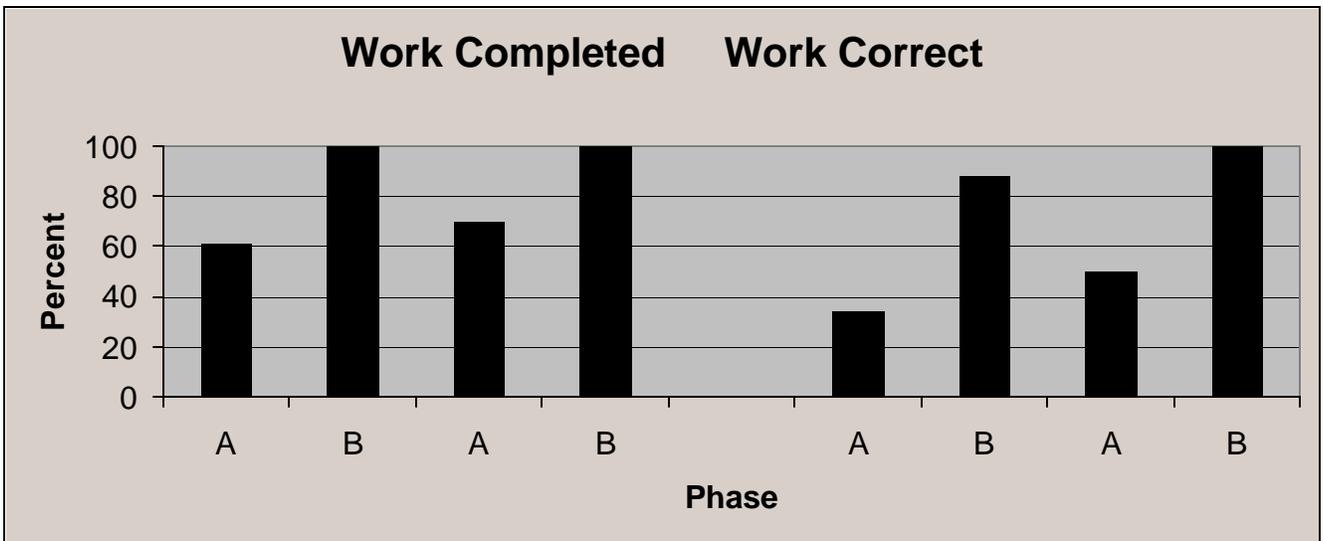


Figure 10: Steve's Academic Productivity

a level nearly equal to his first baseline percentage ($x=47\%$). Again, increases were seen in the return to treatment with averages of 72% in the no response cost condition, 91% in the response cost condition, and an overall average of 84% on-task.

Steve produced relatively low levels of classwork completion ($x=61\%$) and correct completion ($x=34\%$) during the baseline phase, as can be seen in Figure 10. However, he completed 100% of his morning work and did so correctly 88% of the time during the first treatment phase. The reversal probe showed significant decreases in his percentage of work complete ($x=70\%$) and work correct ($x=50\%$). After the reintroduction of the school-home notes, Steve completed 100% of his work correctly.

Maurice

Maurice's percentages of on-task intervals throughout the study may be seen in Figure 11. During baseline, he was on-task an average of only 30% of the time. He increased his average to 79% in the first treatment phase with 85% on days with no response cost notes and 74% on days with response cost notes, showing what appears to be an advantage of the traditional, no response cost school-home note. The reversal probe in the third phase of the study measures Maurice's average on-task behavior to be 46%, showing a significant drop. The reintroduction of the notes in the next treatment phase increased Maurice's on-task average to 89%, with the response cost note ($x=94\%$) showing additive effectiveness over the traditional note ($x=86\%$).

Maurice's classwork performance is summarized in Figure 12. He began this study in the baseline phase completing an average of 60% of his work with only 53% being correct. During treatment he completed 95% of his work and was correct 85% of the time, which showed a significant increase over baseline levels. The return to baseline did not, however, result in decreases of completed work ($x=100\%$), but percentage of work correct did decrease slightly ($x=77\%$). In the second treatment phase, Maurice completed 94% of his morning work and was correct on 92% of it.

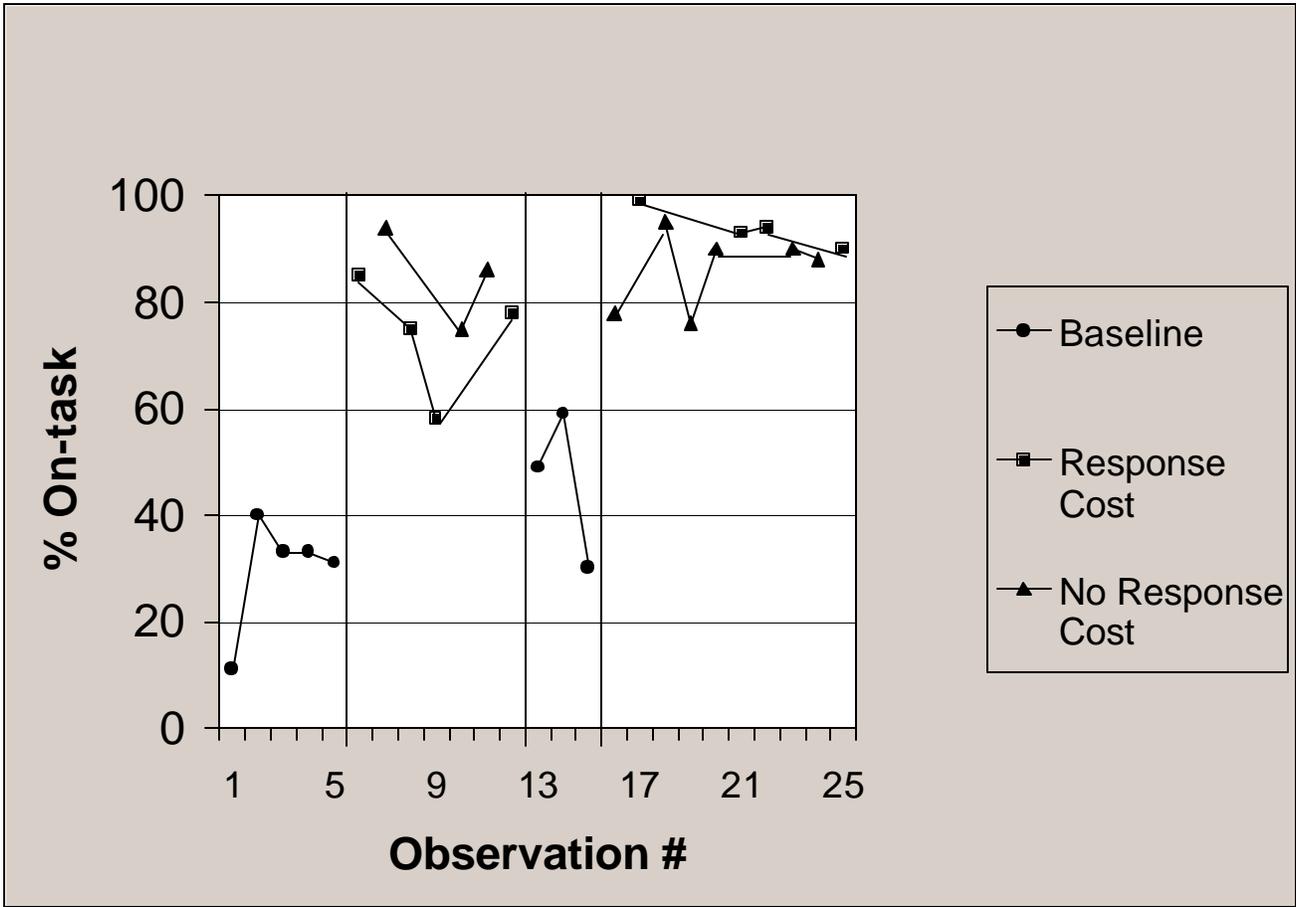


Figure 11: Maurice's On-task Behavior

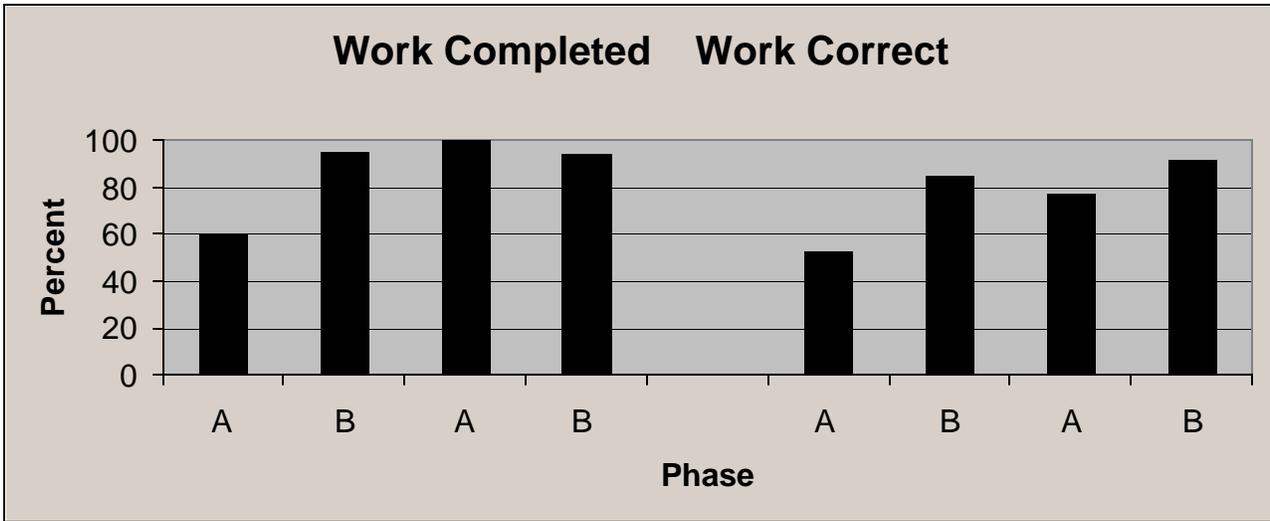


Figure 12: Maurice's Academic Productivity

Treatment Integrity

In general, parents were extremely compliant in administering the treatment. They were consistent in reviewing the daily notes, providing consequences as outlined in the school-home note contract, and returning the notes to school each day. The returned notes allowed for monitoring of treatment integrity as the parent was required to record the reward or consequence provided each afternoon. Every note was received from Charles, Lauren, Steve, and Maurice. Joe did not return the previous day's note on three occasions. His mother reported that he did not bring the note to her one day. Two other days she had been given the note and recorded the rewards, but Joe lost the note before returning it to school. Jerry's mother had to be contacted four times due to the previous day's note not being returned. Each time she indicated that she had seen the note, provided the appropriate consequences, and simply forgot to place the note back in Jerry's homework folder in order for it to be returned.

Treatment Acceptability

Pre-treatment and post-treatment scores obtained from both teachers and all six mothers on the Treatment Evaluation Inventory–Short Form (TEI-SF) as well as scores obtained from all six student participants on the Children's Intervention Rating Profile (CIRP) are presented in Table 3. The TEI-SF is a nine item questionnaire with a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." Total scores may range from 9, indicating low acceptability, to 45, indicating very high acceptability.

All six mothers completed the TEI-SF pre-treatment. Four mothers rated the school-home note intervention as more acceptable than the other treatments described in the vignettes (time out and positive consequences only). Two of them preferred the response cost note and two preferred the no response cost note. Of the four who rated the notes higher, three mothers rated time out as the least

acceptable intervention, and one rated positive reinforcement as the least acceptable. The other two mothers rated all four interventions as equally acceptable.

Only three mothers completed the TEI-SF post-treatment. Two of them rated the response cost note as the most acceptable intervention. The other mother rated all four techniques as equally acceptable, which she had done pre-treatment as well.

Both teachers completed the measures both before and after the study. Mrs. May rated all four treatments equally at pre and post-treatment. All four were rated as more acceptable after the study than they has been prior to the study. Mrs. Rogers rated the response cost note as the most acceptable of the interventions both pre and post-treatment. After the study, however, her TEI-SF score for the response cost note was a 45, the highest possible acceptability rating. Both notes were judged to be significantly more acceptable than time out or positive reinforcement.

It is not clear whether or not all of the participants truly understood the directions. Perhaps a more reliable measure of treatment acceptability would have been obtained if the vignettes and items had been read to them.

The CIRP is a seven item questionnaire, also with a 5-point Likert scale. The children rated each of the seven statements along a continuum from “I agree” to “I do not agree.” Total scores may range from 7, indicating low acceptability, to 35, indicating high acceptability of the treatment. All six children completed the measure with the assistance of one the investigators both before the study and at its completion. Although the descriptions of the treatments in the vignettes and the items of the CIRP were read to the children, it was clear that they did not understand many of the items. It often appeared as though they were marking randomly on the page or attempting to create a pattern with their marks. Most of the children constantly looked to the researcher reading the items for guidance on how to answer. This is certainly not a valid measure of the children’s attitudes toward the interventions.

Table 3 - Treatment Acceptability Ratings Before and After Treatment

	MOTHER		TEACHER		CHILD	
	Pre	Post	Pre	Post	Pre	Post
Charles						
No RC	37	40	38	43	27	27
RC	37	40	38	43	20	27
Time Out	37	40	38	43	7	19
Pos Rein	37	40	38	43	23	27
Lauren						
No RC	32	35	Same		35	27
RC	33	37	As		31	27
Time Out	14	10	Above		27	19
Pos Rein	11	9			27	27
Jerry						
No RC	45		37	43	32	31
RC	45		38	45	31	23
Time Out	45		14	15	15	29
Pos Rein	45		26	29	27	27
Joe						
No RC	35		Same		35	19
RC	34		As		31	19
Time Out	17		Above		22	21
Pos Rein	33				25	29
Steve						
No RC	42		Same		31	21
RC	44		As		31	35
Time Out	31		Above		23	7
Pos Rein	37				27	27
Maurice						
No RC	32	29	Same		22	25
RC	32	32	As		35	35
Time Out	30	24	Above		11	7
Pos Rein	30	25			31	27

Because it was felt that the treatment acceptability measures did not render valid results, a less formal indication of social validity was obtained. All participants were interviewed privately by one of the investigators at the completion of the study in an unstructured conversation. Teachers and students were interviewed at school, while mothers were contacted by phone. Interview questions attempted to assess how each participant felt about the two school-home note interventions used. Questions asked included: Did you feel the school-home note helped you/your child/your student? Would you like to continue using the school-home note for yourself/your child/your student? Would you recommend the school-home note to a friend who was experiencing similar behavior problems with a child/student? How easy or difficult was the school-home note to use? Overall, how pleased are you with your/your child's/ your student's behavioral and academic improvements? Which of the two school-home notes do you prefer?

Did you feel the school-home note helped you/your child/your student?

All six mothers indicated that they felt the intervention had helped their children. Five mothers said they believed their child's classroom behavior and academic performance had increased "very much." Both teachers stated that they had seen dramatic improvements in all the students except Jerry, whom Mrs. Rogers saw only moderate improvements in overall. All of the students stated that they felt the school-home note had helped them to "do much better in school."

Would you like to continue using the school-home note for yourself/your child/your student?

All participants reported that they would like to continue using a school-home note. However, the teachers requested that the school-home note be designed for use throughout the entire school day rather than just the morning period.

Would you recommend the school-home note to a friend?

The mothers all agreed that they would recommend a similar intervention to a friend whose child was displaying similar behavior problems and low academic productivity in the classroom. Both

teachers indicated that they had, in fact, already suggested using school-home notes as a behavioral intervention to several fellow teachers with behavior problems in their classrooms. All of the children stated that they would want their friends to use a school-home note because it might “help them do better.”

How easy or difficult was the school-home note to use?

All participants indicated that the intervention was easy to use. The teachers especially appreciated how little time and effort were required to use the note, even when multiple children in the classroom were utilizing them.

Overall, how pleased are you with your child's/your student's improvements?

Five mothers stated that they were “very pleased” with their children’s overall behavioral and academic improvements since the initiation of the study. One parent explained that she was “fairly pleased” with her son’s improvements. Mrs. May reported that she was “very pleased” with the improvements made by both of her students, Charles and Lauren. Mrs. Rogers reported that she was “very pleased” with her students Joe, Steve, and Maurice and “fairly pleased” with Jerry. She explained that Jerry’s academic productivity had enjoyed far greater improvements than his classroom behavior.

Which of the two school-home notes do you prefer?

All six mothers agreed that the school-home note with response cost was preferable to the traditional, no response cost note. Both teachers indicated that they perceived their students to be more on-task and productive during the response cost condition as well. The children explained that they enjoyed the smiley faces on the response cost note, and therefore preferred it to the other note. When asked if they became upset when asked to cross off a smiley face by their teacher, all the children answered, “no.”

After answering this last treatment acceptability question, each participant was shown the graphs of each child's on-task behavior percentages. Even when it was explained that the response cost note had no additive effectiveness over the no response cost note, all participants stuck to their original choice of the response cost note as the more preferable of the two.

DISCUSSION

The efficacy of two school-home note interventions for increasing the on-task behavior of impoverished children with diagnoses of Attention-Deficit/Hyperactivity Disorder was compared. Two forms of school-home notes were implemented. Both procedures utilized identical elements to provide for daily feedback and homed based reinforcement for satisfactory classroom performance. The only distinction between the two notes was the inclusion of a response cost component on one of the notes. Specifically, five smiley faces were added that were crossed off when the participant displayed inappropriate behavior.

Overall, the observational data showed that both notes were effective in increasing on-task behavior in all six participants, as hypothesized. It was also hypothesized that the response cost note would result in added increases in on-task performance as compared to the note without response cost. The degree of differential effectiveness varied across participants. Greater improvements during the response cost condition were seen in the performances of Charles and Steve. Conversely, Jerry appeared to perform slightly better with the no response cost note. For half of the participants, Lauren, Joe, and Maurice, no differences were measured in their on-task percentages during either intervention.

The data gathered during the observations were very clear-cut for five of the six participants. The use of a school-home note was an effective way to increase on-task performance. Charles, Lauren, Jerry, Steve, and Maurice all showed significant improvements in their classroom behavior at the time of intervention, which stabilized relatively quickly. They each showed decreases in their on-task behavior when the treatment was removed, and quickly regained the treatment effects in the second treatment phase, again stabilizing quickly. Joe's behavior, however, requires further analysis. In no phase of the study did his on-task behavior stabilize. As can be seen in Figure 7, his performance was variable across all conditions. Although variable, on-task rates were higher during treatment.

Although not hypothesized at the outset of the current study, another question arose about the possible differences in efficacy of the two types of notes. The data measuring the percentages of disruptive behavior during each observation was analyzed to determine if the response cost note was more effective in decreasing disruptive behavior than the note without response cost. Both notes were so effective in decreasing, and in most cases nearly eliminating, disruptive behavior that there was no room for added efficacy of either note. All six participants emitted extremely low rates of disruptive behavior, as defined by the observational coding system used, in both treatment conditions (range 0% - 5.7%, \bar{x} =1.9%). These results suggest that both notes were effective in decreasing disruptive behavior.

For all children, accurate classwork completion increased substantially. Three of the subjects, Jerry, Joe, and Steve, decreased their work completion and accuracy when the treatment was removed. The other three, Charles, Lauren, and Maurice maintained their high treatment levels of completion and accuracy in the short absence of the school-home note during the reversal probe. It is important to recognize that although other elements operating in the classroom appear to be maintaining these treatment gains, it is still undeniable that the initial implementation of the note was the cause of the improvements. It is possible that once these three were receiving parent and teacher praise for improved grades, this served as reinforcement enough to keep the children working, even when the note was no longer being sent home for the contracted reinforcement of satisfactory behavior.

Again we turn to Joe for a deeper examination of the treatment effects he experienced. Although we saw less impressive results in his observational data, the efficacy of the school-home note in dealing with his academic behavior becomes clearer when we view his classwork percentages. As can be seen in Figure 8, Joe was completing a very low percentage of his classwork during the initial baseline phase. Upon the implementation of the note, Joe immediately increased his productivity. Immediately he began completing his

classwork and doing so with great accuracy. In fact, Joe was usually one of the first students in Mrs. Roger's class to complete their morning work. After completing his work, however, Joe reverted to his baseline behavior of fidgeting, playing with objects, getting out of his seat, and talking while waiting for his classmates to complete their work. This, in part, explains the variability in his on-task percentage points in Figure 7. Several observations were done daily on several different students in each class. If the researcher completed Joe's observation first, while he was still working, the researcher was more likely to obtain a higher on-task percentage. On the other hand, if Joe's observation was conducted later in the morning after he had completed his work, it was likely to render a very low number. Upon beginning the second phase of treatment, Mrs. Rogers had arranged for Joe to have special assignments to work on after his morning work was completed. This may explain why his two on-task points from the second treatment phase were so high.

The treatment acceptability data gathered from the informal interviewing of all participants indicates that the note was highly acceptable to all participants. No treatment study to date has examined the efficacy of home-based interventions in targeting the classroom behavior of impoverished children, much less those with ADHD. This is certainly an important area of research when considering the prevalence of ADHD in ethnic minorities (Samuel et al., 1997). The promising results of the treatment acceptability measures in this study suggest that the use of school-home notes is a good place to begin developing this research area further, as parents of the minority children agreed that this intervention was both acceptable and effective. Of the seven families that initially showed interest in this study, only one decided to treat their child's off-task behavior with medication. This study has shown that not only are mothers of disadvantaged families capable of implementing this treatment, but they are likely to find it acceptable and effective.

The specifics of the acceptability data become more important, however, when attempting to decide which of the two notes is a better choice overall for intervening with impoverished, ADHD elementary

students. Because both notes appear to be effective almost interchangeably, the practitioner's first thought should be to turn to the note with no response cost component as it is the more simple, and more positive, of the two. This was explained to the mothers and teachers of each child while attempting to structure an individual note for each to continue using after the study ended. All of them objected, however, stating that they feel the response cost note was more effective. Even after showing the graphs and explaining the results of the study to each mother and teacher, they insisted the "smiley face note" was better. It is certainly possible that the response cost note had advantages over the traditional note that were not measured in this study. As treatment acceptability is an important component of treatment adherence, it is suggested that the parent of each child be given the opportunity to choose which note be utilized in treating their child.

What components in the classroom and home environments of each of these participants lead to the efficacy of the school-home notes? It is clear that the school-home note is an effective tool in decreasing off-task behavior and increasing classwork performance in minority children with ADHD, but what other elements must be present to ensure a positive outcome? This study enjoyed the advantage of two highly competent and motivated teachers. Both Mrs. May and Mrs. Rogers took great interest in the success of each one of their students. They were also open-minded in allowing the research team to intrude in their classrooms and in taking instruction on how to manage the behavior of the participants in this study. There will certainly be times in clinical practice when a client's teacher will be less than willing to carry out the demands of the school home note, no matter how simple.

Also, the parents, namely the mothers, involved in this study are very active in their children's academic and behavioral performance at school. They are a self-selected group who are interested enough in their children's success to respond to a teacher referral for help and follow through with treatment demands. All six mothers competently provided the consequences for the daily school home notes. Treatment integrity,

as measured by the number of school home notes not returned in the child's homework folder, was very highly maintained by all six mothers. On the rare occasion that a note was not returned and the mother was called, she was invariably able to indicate the status of the note in question, good or not good, and recount the specific reward provided.

It was discovered by Mrs. Rogers that Jeremy's mother was often rewarding her son even on days that he did not receive a good note. It is the opinion of Mrs. Rogers that Jeremy would have shown even greater improvements in his behavior and academics if he had not received reinforcement on his "bad days." This is certainly possible. It brings up an interesting question of treatment integrity that had not been previously considered by the researcher. The usual fear in implementing a school home note is that the child will not get the proper reinforcement specified by the contract when he or she brings home a good note. It is important when training parents on the use of the school home note that they know not to reinforce unsatisfactory behavior. Such indiscriminant reinforcement is likely to be just as harmful as a lack of reinforcement when appropriate.

Another factor contributing to the success of the intervention with these six children is each one's ability. They are all of at least average academic achievement levels as measured by the Woodcock-Johnson. The children might not have responded to the note as well, especially as measured by their permanent product, if their abilities had been lower than average.

It is possible that this treatment would have been less effective or not effective at all if any of the previously discussed components had been absent. Without either teacher cooperation, parent involvement, child's ability, or any combination of these, the school home note may not be the best intervention for the classroom behavior of any child, and certainly not a child from an impoverished background with a diagnosis of ADHD. It is the conclusion of this study that either school home note will likely be effective in increasing

the on-task behavior, percentage of classwork completed, and percentage of classwork correct of impoverished elementary aged children with ADHD diagnoses as long as parents are sufficiently involved, teachers are willing to cooperate, and children have at least average academic abilities.

Many of the advantages of home-based reinforcement procedures reported in the literature were enjoyed by the present study. Both parents and teachers indicated that the increased communication was invaluable. Teachers were able to give daily feedback to the parents about each child without having to make phone calls, set up conferences, or send notes that may or may not make it to the parent. Several mothers reported that they enjoyed receiving positive feedback on good days, rather than only hearing from the school when her child was in trouble. Also, the teachers appreciated not having to greatly alter their classroom management routine or take time out of teaching to deal with the “problem students” in this study. Mrs. Rogers indicated that the response cost note especially allowed them to continue teaching quickly after making a quick reprimand and commanding that a smiley face be crossed off. Teachers did not have to spend time discovering and obtaining reinforcers or enforcing punishments for classroom behaviors. Instead, they depended on the more readily available resources, time and tangibles, for providing the consequences for the child’s behavior each day.

This study has made two very important advances in the literature on home-based treatment for classroom behavior. The sample used represents two terribly under-studied populations: children with ADHD and minority children. Although similar studies have been conducted examining the efficacy of school-home note interventions for children with attentional and/or behavioral problems, no study has examined the efficacy for a clinical population, specifically, children qualifying for a diagnosis of ADHD. All six subjects exhibited significant attentional problems and most exhibited hyperactive and impulsive behavior as well. The present study was able to illustrate the utility of using a school-home note intervention for children with ADHD. It is

recommended that such an intervention be used as part of a treatment package for ADHD children whenever possible.

Perhaps more importantly, this study was able to incorporate a population previously untouched in the literature on home-based interventions for classroom behavior, minority, inner-city children. There is certainly a need for research in this area with this population. Consider that lower income and less educated parents are less likely to be involved in the education and school activities of their children than higher income and more educated parents (Hoover-Dempsey, Bassler, & Brissie, 1992). Then consider that parent involvement in a child's academic career is associated with success in school (Grolnick et al., 1997). Clearly, ways to increase parent involvement in a child's academic career, especially in minority and low socio-economic status families, must be discovered.

When measuring the impact of this study on current practice, the overlap of these two populations must be considered. Not only are ethnic minority children more likely to be diagnosed with ADHD (Samuel et al., 1997), but children from low socio-economic families are likely to show more severe symptoms of ADHD (Barkley, 1997). The present study suggests that procedures already enjoying empirical support in the treatment of middle-class, Caucasian children with attentional problems (Ayllon, Garber, & Pisor, 1975; McCain & Kelley, 1994; Kelley & McCain, 1995) may, in fact, be equally effective in treating lower-class, minority children with ADHD.

Future directions of research should involve group design studies to further test the efficacy of school-home notes on larger samples of minority children with ADHD. This study included six African-American students, however, future studies should target children from other minority groups as well. Also, student participants should be selected not only through teacher referral, but also through parent and physician referral.

Although the current study did not involve any participants taking medication to control their hyperactive and inattentive behavior, it is very common for children with ADHD diagnoses to be taking psychostimulant medication. Thus, future studies should investigate the additive benefits of school-home notes combined with medication over medication alone.

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APPENDIX: PARENT, CHILD, AND TEACHER CONSENT FORMS

LSUHSC-NO
EKL-Kelley School-Home Notes
Rev. 4/3/02
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Louisiana State University Health Sciences Center in New Orleans Informed Consent

PARENT CONSENT FORM

- 1. Study Title:** Relative Efficacy of School-Home Notes With and Without Response Cost In Impoverished Elementary School Students with Attention-Deficit/Hyperactivity Disorder
- 2. Performance Sites:** Children and their parents will be recruited on a voluntary basis from ADHD Clinic at Earl K. Long Hospital in Baton Rouge. The study will take place in the classroom of the East Baton Rouge Parish school which each child attends.
- 3. Names and Telephone Numbers of Investigators:** If you have questions concerning this form or the study, please contact Mary Lou Kelley, Ph.D. or Niki Jurbergs at (225)-358-1321 on Monday through Friday, 8:00 a.m. to 4:30 p.m, or the 24-Hour Crisis Hotline at (225)-924-3900 24 hours a day.
- 4. Purpose of Study:** The purpose of this research study is to determine which of two types of classroom interventions is more effective in increasing on-task behavior of elementary school children. The treatments used on your child will attempt to increase his or her performance at school. Your child's behavior in the classroom and his or her classwork will be studied, as well as your and your child's opinions of the treatments used. This study will evaluate which of the two treatments is more effective in increasing your child's appropriate behavior and work completion in the classroom. Elementary school children in grades one through three, their parents, and their teachers will participate in this study. The study will involve 4 students, their parents, and their teachers.
- 5. Descriptions of Study Procedures:** If you and your child decide to participate in this research study, you will first be asked to fill out several measures regarding your family, your child's off-task and disruptive behavior, and how you feel about several classroom interventions. These include the Conners' Parent Rating Scale, the Achenbach Child Behavior Checklist, and the Treatment Evaluation Inventory. Your child will be asked to fill out the Children's Intervention Rating Profile to describe his/her feelings about the two classroom interventions being used in the study. Your child's teacher will be contacted and asked to participate as well. She will fill out similar measures including the Conners' Teacher Rating Scale, the Achenbach Teacher Report Form, and the Treatment Evaluation Inventory. You, your child, and your child's teacher will meet with the researcher before the study begins for a brief training session to teach you how to use the school-home note interventions being studied and to make a contract with your child regarding his behavior at school. Then you will meet once a week to renegotiate the contract for the duration of the study. Your child's teacher will send one of two types of notes home with him or her daily throughout the study that describes his or her classroom behavior on that day. You will be asked to provide small rewards and consequences, which will be specified in the contract, for your child's behavior at school.

The school-home notes being used will allow your child's teacher to rate him/her daily on two specific behaviors in the classroom: 1) Used Classtime Well and 2) Completed Classwork. Your child will receive a "yes," "so-so," or "no" for each of these behaviors. The two notes differ in one important way. One note also has five smiley faces on it, and your child will be asked by the teacher to cross off a face each time he or she acts disruptively in class. The "yes," "so-so," or "no" ratings and the smiley faces not crossed off at the end of the day will earn your child points. Based on the number of points on the note and the contract filled out prior to the study, you will provide your child with a small reward (such as extra TV or video game time, a special snack, or late bedtime) or a small consequence (such as no TV for the evening).

6. Benefits to Subject: Possible benefits of participating in this research project include increases in your child's classwork completion and an improvement in his/her classroom behavior. The two school-home notes being used in this study are designed to increase on-task behavior and past research has shown that they are effective interventions. Not only may your child personally benefit from participation, the results of our study will add to the literature on treating children with ADHD and will benefit children in the future.

7. Risks to Subject: It is possible that your child will not appreciate the interventions being used in this study. He or she will most likely be the only child in the classroom who the teacher is using a school-home note with. This may make him or her feel different from the rest of the children in the class. It is also possible that your child will begin to enjoy the school-home notes after success earns him/her a reward. It is likely that this will increase your child's enthusiasm about the study. Also, you or your child may experience distress from the questions asked on the measures. If this happens, immediate treatment or an outpatient appointment will be provided to you at no charge. The researchers involved in this study are mandatory reporters of any child abuse or neglect. If child abuse or neglect is suspected, it will be reported to the Office of Community Services (OCS).

8. Alternatives to Participation in the Study: If you and your child choose not to participate in this study, you still have the opportunity to remain clients at ADHD Clinic at Earl K. Long Hospital and receive standard treatment from psychology interns and pediatricians.

9. Subject Removal: Your child will be removed from this study if his or her teacher refuses to participate. Also, if your child is on psychostimulant medication to treat ADHD he or she may be removed if the medication dose is changed during the course of the study. Your child will be removed from the study if you fail to provide promised rewards and consequences for the school-home notes.

10. Subject's Right to Refuse to Participate or Withdraw: Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

11. **Subject's Right to Privacy:** All information is gathered strictly for research purposes only. The privacy and confidentiality of all subjects will be protected. Only the researchers involved in this study will have access to participants' information. The results of this study may be published, released to a funding agency, or presented in a scholarly fashion, but the privacy of the participants will be protected and their names will not be used in any manner. Data will be kept confidential unless release is legally compelled.

12. **Release of Information:** The information from this study may be released to the LSUHSC Institutional Review Board.

13. **Financial Information:** There is no cost for participation in the study, nor is there any compensation to the subjects for participation.

14. **Signatures:**

This study has been discussed with me and all my questions have been answered. I understand that additional questions regarding study should be directed to the investigators listed on the first page of this consent form. I understand that if I have any questions about subjects' rights, or other concerns, I can contact the Chancellor of LSU Health Sciences Center at (504) 568-4801. I agree with the terms above, acknowledge that I have been given a copy of the consent form, and agree to participate in this study. I understand I have not waived any of my legal rights by signing this form.

Signature of Parent/Guardian

Date

Signature of Witness

Date

The study's subject has indicated to me that the subject is unable to read. I certify that I have read this consent form to the subject and explained that by completing the signature line above the subject has agreed to participate.

Signature of Reader

Date

Signature of Person Administering Consent

Date

Signature of Principal Investigator

Date

CHILD ASSENT FORM

I agree to be in study about ways to help me behave in class and finish my work. I will have to fill out a measure that asks me to tell how I feel about two different kinds of notes that my teacher will be sending home with me. I will have to fill this out two times, once before I start getting notes, and once after I have been getting the notes for a while. I can be in the room with my Mom or Dad while I fill these out and someone can read the questions and answers out loud to me. I will bring a note home from school to my parents every day for six weeks that tells them how I acted in class. Mom or Dad will give me a reward if my teacher sends a good note or will take away one of my privileges if my teacher sends a bad note. My parents will answer some questions about the way I act at home and at school. If filling out the measure, taking notes to my parents everyday, or having my parents answer questions about me makes me upset, I do not have to be in this study. If the people running the study think that someone is hurting me, they will tell someone about it. I can decide to stop being in this study at any time without getting in trouble.

Child's Name and Age

Child's Signature

Date

The study subject is a child and I certify that I am his/her legal guardian.

Legal Guardian's Name

Legal Guardian's Signature

Date

Louisiana State University Health Sciences Center in New Orleans Informed Consent

TEACHER CONSENT FORM

1. **Study Title:** Relative Efficacy of School-Home Notes With and Without Response Cost In Impoverished Elementary School Students with Attention-Deficit/Hyperactivity Disorder

2. **Performance Sites:** Children and their parents will be recruited on a voluntary basis from ADHD Clinic at Earl K. Long Hospital in Baton Rouge. The study will take place in the classroom of the East Baton Rouge Parish school which each child attends.

3. **Names and Telephone Numbers of Investigators:** If you have questions concerning this form or the study, please contact Mary Lou Kelley, Ph.D. or Niki Jurbergs at (225)-358-1321 on Monday through Friday, 8:00 a.m. to 4:30 p.m, or the 24-Hour Crisis Hotline at (225)-924-3900 24 hours a day.

4. **Purpose of Study:** The purpose of this research study is to determine which of two types of classroom interventions is more effective in increasing on-task behavior of elementary school children. The treatments used on your student will attempt to increase his or her performance at school. Your student's behavior in the classroom and his or her classwork will be studied, as well as your opinions of the treatments used. This study will evaluate which of the two treatments is more effective in increasing your student's appropriate behavior and work completion in the classroom. Elementary school children in grades one through three, their parents, and their teachers will participate in this study. The study will involve 4 students, their parents, and their teachers.

5. **Descriptions of Study Procedures:** If you decide to participate in this research study, you will first be asked to fill out several measures regarding your student's off-task and disruptive behavior, and how you feel about several classroom interventions. These include the Conners' Teacher Rating Scale, the Achenbach Teacher Report Form, and the Treatment Evaluation Inventory. You will meet with the researcher before the study begins for a brief training session to teach you how to use the school-home note interventions being studied. You will send one of two types of notes home with the student daily throughout the study that describes his or her classroom behavior on that day.

The school-home notes being used will allow you to rate the student daily on two specific behaviors in the classroom: 1) Used Classtime Well and 2)Completed Classwork. You will give the student a "yes," "so-so," or "no" for each of these behaviors. The two notes differ in one important way. One note also has five smiley faces on it, and you will ask the student to cross off a face each time he or she acts disruptively in class. The "yes," "so-so," or "no" ratings and the smiley faces not crossed of at the end of the day will earn points for your student. Based on the number of points on the note and the contract filled out prior to the study, the child's parent will provide a small reward (such as extra TV or video game time, a special snack, or late bedtime) or a small consequence (such as no TV for the evening).

6. **Benefits to Subject:** Possible benefits of participating in this research project include increases in your student's classwork completion and an improvement in his/her classroom behavior. The two school-home notes being used in this study are designed to increase on-task behavior and past research has shown that they are effective interventions. Not only may your student personally benefit from participation, the results of our study will add to the literature on treating children with ADHD and will benefit children in the future. Participation in this study may also result in gaining new ideas on classroom management strategies for all of your students.

7. **Risks to Subject:** It is possible that the child will not appreciate the interventions being used in this study. He or she will most likely be the only child in the classroom who you are using a school-home note with. This may make him or her feel different from the rest of the children in the class. It is also possible that the student will begin to enjoy the school-home notes after success earns him/her a reward. It is likely that this will increase your student's enthusiasm about the study. Also, you may experience distress from the questions asked on the measures. If this happens, immediate treatment or an outpatient appointment will be provided to you at no charge.

8. **Alternatives to Participation in the Study:** If you choose not to participate in this study, the researcher will continue to provide outpatient treatment for the student.

9. **Subject Removal:** Your student will be removed from this study if you, as the teacher, refuse to participate or do not send the school-home notes home daily. Also, if the student is on psychostimulant medication to treat ADHD he or she may be removed if the medication dose is changed during the course of the study. The child will also be removed from the study if his/her parent fails to provide promised rewards and consequences for the school-home notes.

10. **Subject's Right to Refuse to Participate or Withdraw:** Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

11. **Subject's Right to Privacy:** All information is gathered strictly for research purposes only. The privacy and confidentiality of all subjects will be protected. Only the researchers involved in this study will have access to participants' information. The results of this study may be published, released to a funding agency, or presented in a scholarly fashion, but the privacy of the participants will be protected and their names will not be used in any manner. Data will be kept confidential unless release is legally compelled.

12. **Release of Information:** The information from this study may be released to the LSUHSC Institutional Review Board.

13. **Financial Information:** There is no cost for participation in the study, nor is there any compensation to the subjects for participation.

14. **Signatures:**

This study has been discussed with me and all my questions have been answered. I understand that additional questions regarding study should be directed to the investigators listed on the first page of this consent form. I understand that if I have any questions about subjects' rights, or other concerns, I can contact the Chancellor of LSU Health Sciences Center at (504) 568-4801. I agree with the terms above, acknowledge that I have been given a copy of the consent form, and agree to participate in this study. I understand I have not waived any of my legal rights by signing this form.

Signature of Subject (Teacher)

Date

Signature of Witness

Date

Signature of Person Administering Consent

Date

Signature of Principal Investigator

Date

VITA

Nichole Jurbergs earned her bachelor's degree in psychology from the University of Tennessee at Knoxville. She graduated *Magna Cum Laude* in May 2000. She is currently a doctoral student at Louisiana State University in the clinical psychology program. Her clinical and research interests include externalizing disorders, classroom and academic interventions, and parent training.