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Relative efficacy of school-home notes and teacher feedback in minority elementary students with Attention-Deficit/Hyperactivity Disorder

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RELATIVE EFFICACY OF SCHOOL-HOME NOTES AND TEACHER FEEDBACK
IN MINORITY ELEMENTARY STUDENTS WITH
ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

A Dissertation

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

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by

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ABSTRACT

School-home notes have proven to be an effective and acceptable method for improving children's classroom behavior. School-home notes require teachers to rate students on any number of target behaviors and parents to provide consequences based on the evaluation. School-home notes recently have been shown to increase attention in low income children with ADHD. Although successful at decreasing off-task behavior in the classroom, treatment integrity (parent providing earned consequences at home) is not always maintained at acceptable levels. The goal of the current research was to dismantle the proven school-home note to identify the efficacy of the teacher feedback component alone. A behavior rating procedure, similar to a school-home note with the exception that it was not sent home and parents were not responsible for contingencies, was used. The present study examined the effectiveness of teacher-administered feedback through the use of a behavior note relative to an identical school-home note for increasing classwork completion and appropriate classroom behavior in minority elementary school children with ADHD. Students in both treatment groups showed significant increases in on-task behavior and classwork accuracy, suggesting that the teacher feedback procedure may be effective in improving classroom behavior. However, the students receiving a school-home note exhibited higher levels of on-task behavior than those in the group receiving teacher feedback alone, suggesting that the school-home note remains a superior intervention.

INTRODUCTION

Attention-Deficit/Hyperactivity Disorder (ADHD) is the most common child referral to mental health clinics in the United States, accounting for nearly 50% of all referrals to outpatient clinics (Frick & Lahey, 1991). ADHD is also the most common psychological disorder in children (Rowland, Lessene, & Abramowitz, 2002). Primary symptoms of ADHD include inappropriate levels of inattention, impulsivity, and hyperactivity. Children with ADHD are also at risk for numerous other problems including learning problems, low academic achievement, poor social skills, and low self-esteem (Frick & Lahey, 1991).

The 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). 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 and disruptive behavior in the classroom, and

poor academic achievement. Up to 30% of children with ADHD fail to complete high school (Weiss & Duncan, 1992).

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) with approximately 80-90% of children responding favorably (Pelham, Wheeler, & Chronis, 1998). Children benefiting from pharmacological treatment will exhibit relatively normalized behavior with decreased hyperactivity and increased compliance. The main effects of these stimulants on behavior, however, are limited to the three to twelve hours that they are active in the body (Pelham et al., 1993). Side effects from stimulants may include decreased appetite, stomachaches, elevated heart rate, and insomnia, although most children tolerate the medication quite well (Anastopoulos, Barkley, & Shelton, 1996). More recently, atomoxetine (Strattera), a non-stimulant medication, has been added to the list of drugs considered to be the first line of treatment for ADHD (Wilens, Biederman, & Spencer, 2002). Though often associated with a lower risk of side effects, early studies suggest that fewer children benefit from atomoxetine than do from stimulants.

A number of studies have been conducted comparing the relative efficacy of pharmacological and behavioral treatment for ADHD. The MTA study (1999) compared the efficacy of medication management, behavioral treatment, both medication and behavioral treatment, and standard community care in reducing symptoms of 7- to 10-year-old children with ADHD. Results indicated that medication management and medication plus behavioral treatment were equally effective in decreasing the core symptoms of the disorder. However, the combination treatment was more effective than medication alone in decreasing related symptoms

including oppositional behavior, aggression, internalizing symptoms, teacher-related social problems, and parent-related interpersonal problems. This suggests that behavioral intervention may be useful, even when pharmacological treatment is being utilized. Greenhill, Halperin, and Abikoff (1999) point out that although medication has proven to be beneficial in the treatment of ADHD, studies on the use of pharmacotherapy alone have not reported improved long-term prognosis.

Current research suggests that a combination of stimulant medication and behavioral interventions are the most effective treatment for managing ADHD in the classroom (Abramowitz, Eckstrand, O’Leary, & Dulcan, 1992; Carlson, Pelham, Milich, & Dixon, 1992; Pelham et al., 1993). The following review will highlight classroom interventions that have been evaluated for effectiveness 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.

Research consistently has shown that positive consequences alone are not sufficient to maintain the desired behavior of ADHD children (Acker & O’Leary, 1987; Forehand, 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 consequences alone were ineffective in controlling inattentive and disruptive behavior. Students were on-task only 45% of the time during the treatment phase with only positive consequences. However, the children remained on-task an average of 75% of the time when negative consequences were included, either with or without positive consequences.

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 in place, neither of the positives, regular or enhanced, was 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 and colleagues (1982) add that a teacher may increase the effectiveness of a reprimand by maintaining eye contact, standing in close proximity, and grasping the student's shoulders. Short reprimands appear to be more effective than longer ones (Abramowitz, O'Leary, & Fattersak, 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 a form of punishment that can be implemented quickly and effectively by teachers in the classroom.

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 et al., 1999). Disruptive behavior was defined as being out-of-seat, vocalizing, or 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 with 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 that the child 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 attention away from the other students, making time-out an inefficient intervention for punishing misbehavior in the classroom (Barkley, 2000).

Many classrooms contain token economies 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). More recently, response cost components have been added to token systems in order to increase their effectiveness (Kerr & Nelson, 1983; McGoey & DuPaul, 2000; 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 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 each 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 each 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 decreasing inconsistent classwork performance in ADHD students. Carlson, Mann, and Alexander (2000) had forty 8- to 12-year-old students with ADHD complete math problems in either a reward, response cost, or no contingency condition. In the reward contingency, students earned tokens based on the number of problems answered correctly. Children in the response cost condition were given tokens prior to completing the math task and lost them for problems answered incorrectly or not answered. The children in the response cost condition had the highest percentage of problems correct.

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 behavioral 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 low SES, ADHD children. 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, Safer, dos Reis, & Riddle, 1998).

Parental Involvement in Disadvantaged Families

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 (Karraker, 1972; Rosen, Gabardi, Miller, & Miller, 1990).

Grolnick, Benjet, Kurowski, and Apostoleris (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.

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, Hurwitz, and Weldon (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. In

addition, Moles has noted that teachers perceive relationships with these parents as very difficult to develop. Specifically, 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). Even worse, teachers may assume that these parents are completely uninterested in their children's education.

Raffaele and Knoff (1999) have identified several reasons that underlie the lack of parental support from disadvantaged families. Parents may have experienced personal academic failure and may be unsure of their ability to assist their children. Also parents may feel disempowered by the bureaucracy of schools or believe that their values are different from those of school administrators. Another barrier to home-school collaboration involves disadvantaged parents and educators lacking the skills necessary to productively interact with each other (Moles, 1993).

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. However, if such a relationship is unable to be established, the burden of intervention for academic and behavior problems in the classroom is left to be tackled by the teacher.

School-Home Notes

School-home notes are home-based classroom interventions that allow parents to receive daily feedback about 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 contingencies have many advantages over school-based intervention. School-home notes provide increased communication between parent and teacher and encourage greater parent involvement. The procedure allows 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 efficiency of school-home notes are valuable advantages of this home-based intervention (Kelley, 1990).

Ayllon, Garber, and Piser (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 decreased from 90% during baseline to zero during the treatment phase.

Researchers also have targeted academic performance using school-home note communication (Blechman, Kotanchik, & Taylor, 1981; Blechman, Taylor, & Schrader, 1981). For example, Blechman, Taylor, and Schrader (1981) used a "Good News Note" to increase consistency of math classwork in a group of elementary students with inconsistent performance. Teachers sent a note home on days that 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 also been researched (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 fourth-grade boys in a public school. A multiple-baseline design with alternating treatments was used. On-task (oriented towards work), off-task (not oriented towards work), and disruptive behaviors (out of seat, making noise, or other teacher disapproved behaviors) were recorded. Parents were instructed to reward good notes according to a contract that outlined contingencies for reinforcement. The school-home notes with response cost required that parents provide consequences contingent on minimal loss of response cost points in addition to satisfactory behavior ratings. The addition of that component increased the effectiveness of the intervention beyond the traditional school-home note without response cost. That is, 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 at each instance of off-task or disruptive behavior. 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 over the traditional school-home note.

More recently, Jurbergs (2002) compared the effectiveness of similar school-home notes with and without response cost in improving the classroom performance of six African-American first and second grade students with ADHD. A reversal design with alternating treatments was utilized. On- and off-task behavior was measured through direct observation. Academic productivity was measured in percentage complete and percentage correct during each phase. Again, both on-task classroom behavior and academic productivity increased in all participants during treatment phases. Also, accurate classwork completion increased substantially. However, no consistent added benefits of the response cost component were found. The school-home note with response cost was more effective in increasing on-task behavior for two of the subjects, while the no response cost note was more effective for one of the subjects. The other three subjects, however, showed no difference in levels of on-task behavior between the two notes. The same study also examined treatment acceptability. The interview data collected at the conclusion of the study indicated that both notes were highly acceptable to all teachers, parents, and students involved. Although no differences in treatment efficacy were demonstrated, all participants reported finding the response cost note more acceptable.

In summary, school-home notes have been shown to be effective (Ayllon et al., 1975; Blechman et al., 1978; Jurbergs, 2002; Kelley & McCain, 1995; McCain & Kelley, 1994; Rosen

et al., 1990; 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. Such techniques have also been described as very highly acceptable by parents, teachers and students. 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.

Feedback

Two of the greatest benefits of using a school-home note are the daily teacher feedback provided to parents via the behavior ratings and the fact that they allow the parent to offer powerful reinforcers potentially not available in the classroom. Unfortunately, however, there is no way to ensure treatment integrity. As previously mentioned, Raffaele & Knoff (1999) note that disadvantaged parents are less likely to communicate with the school and follow through with teacher recommendations. In such situations it becomes important for teachers to have an effective "back-up" classroom intervention that does not require parent involvement.

In a recent investigation (Jurbergs, 2002), anecdotal data suggested that teacher feedback might be a powerful behavior modification procedure for improving classroom behavior. In the study, elementary students with ADHD received daily rewards provided by parents contingent upon a "good" school-home note for the day. Teachers rated students on two target behaviors, "Completed Classwork Satisfactorily" and "Used Classtime Well" by circling either "yes," "so-so," or "no" for each behavior. The procedure required that the parent of each child review the note daily, provide the appropriate contracted consequences, and send the signed note back to

school. Treatment integrity measurements indicated that two of the six participants, however, did not consistently return the notes. The mother of one of the students explained that she reviewed the note with her son several times a week, but never provided any of the contracted rewards for good notes. The mother of the other student admitted after the study that she rarely even removed the note from her son's backpack. In spite of no contracted rewards and very minimal parental praise, these two participants showed treatment gains similar to those whose parents exhibited perfect treatment integrity. It is possible that the teacher feedback provided to the students in the form of the behavior ratings played a part in increasing appropriate classroom behavior.

Teacher feedback provided to the student in a format similar to previously studied school-home notes (Jurbergs, 2002) might be a valuable classroom management strategy. If shown to be effective in increasing on-task behavior, such a technique could be utilized with students whose parents are not consistent in reviewing and rewarding school-home notes.

There has been limited research on teacher feedback in the classroom. Drabman and Lahey (1974) designed a behavior modification plan for a disruptive 10-year-old that consisted of verbal feedback with no additional contingencies. The child's teacher rated her behavior on a 0-10 scale at the end of four intervals throughout the class session. Her disruptive behavior decreased significantly. These results suggested that teacher feedback alone may be an effective behavior modification technique.

LaRowe, Tucker, and McGuire (1980) compared feedback and feedback plus reinforcement in controlling noise levels in an elementary school cafeteria. Although they found that the addition of reinforcement was more effective, feedback alone was able to significantly decrease the noise level.

Treatment Acceptability and Consumer Satisfaction

A number of studies have explored the acceptability of school-home note interventions compared to other interventions for classroom behavior problems in children with ADHD. In the majority of these treatment acceptability studies, parents, teachers, and students have been asked to rate treatments after reading a description of a child with ADHD and descriptions of several treatments (Eckert & Hintze, 2000). For example, Power, Hess, and Bennet (1995) asked elementary and middle school teachers in a middle class community to rate the acceptability of stimulant 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 and rated them using a shortened 10-item version of the Intervention Rating Profile-15 (IRP-15; Martens & Meller, 1989). 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.

In another study (Pisecco, Huzinec, & Curtis, 2001), teachers rated descriptions of daily report cards, response cost techniques, classroom lotteries, and medication on their acceptability for treating children with ADHD using the Behavioral Intervention Rating Scale (BIRS; Elliot & Von Brock Treuting, 1991), also adapted from the IRP-15. The daily report card was preferred to all other interventions.

Ekhert and Hintze (2000) point out the methodological limitations of this type of analog research. Treatment acceptability results generated from ratings of descriptions of interventions have limited generalizability and ecological validity. For this reason, some researchers have argued that efforts should turn towards naturalistic acceptability research in which raters actually experience the treatments they are asked to rate (Reimers, Wacker, Cooper, & DeRaad, 1992). Such assessment attempts to identify the acceptability of interventions in the broader social context of the child (Chafouleas, Riley-Tillman, & McDougal, 2002). Far fewer studies have assessed actual consumer satisfaction of classroom interventions rather than treatment acceptability of the interventions based on written descriptions.

Kelley and McCain (1995) conducted a study in which mothers, teachers, and elementary school students rated the acceptability of two different school-home note interventions, one with and one without response cost, that were actually implemented in each child's classroom. The teachers and parents rated the two notes using the IRP-15 and the students used the Children's Intervention Rating Profile-15 (CIRP-15; Witt & Elliot, 1985). Ratings were completed before the interventions were introduced and again after approximately six weeks of alternating notes. The parents rated both notes as more acceptable than the teachers rated them, 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 post-treatment. Additionally, as a simple indication of consumer satisfaction, all participants were asked post-treatment to choose which note they preferred. All five teachers, all five parents, and four of the five students preferred the note with the response cost component.

STUDY RATIONALE

Home-based rewards through the use of school-home notes have been effective in increasing classwork completion and appropriate classroom behavior in elementary students with ADHD. However, treatment integrity may be a problem, especially in disadvantaged families. Anecdotal evidence from school-home note research as well as results of several other school-based studies suggests that the home-based rewards may not be necessary to achieve acceptable levels of on-task behavior. It is possible that teacher feedback alone may be effective in decreasing off-task behavior in the classroom. The purpose of this study was to begin dismantling the previously studied school-home note to identify the essential components. It determined whether a classroom-based, feedback-only intervention could be as effective as a home-based reinforcement intervention by removing the home-based component from the established intervention. This study compared treatment effectiveness of a school-home note condition, a teacher-feedback condition, and a control condition in low SES, minority elementary students with ADHD.

HYPOTHESES

1. Both school-home note and teacher feedback interventions will lead to increased on-task behavior. Both will be more effective than the control condition.
2. The school-home note will be more effective than the teacher feedback intervention at increasing on-task behavior.
3. Both interventions will lead to increased classwork completion and accuracy.
4. Decreases in post-treatment ADHD Rating Scale scores compared to pre-treatment scores will be seen in teacher ratings for both treatment groups. Decreases will not be seen in post versus pre-treatment ADHD Rating Scale scores in parent ratings.
5. Teachers will rate the school-home note intervention higher on a measure of consumer satisfaction than the teacher feedback intervention.

METHOD

Subjects

Forty-three, first through third grade participants were chosen. They were selected using the following criteria: 1) significant levels of off-task/disruptive behavior in the classroom as indicated by the teacher, 2) a diagnosis of ADHD (evaluation consisted of brief parent and teacher interviews, behavioral classroom observation, and parent and teacher behavior rating scales), 3) member of an ethnic minority, 4) average scores on the Woodcock-Johnson Test of Achievement – Third Edition (WJ-III), and 5) attend an East Baton Rouge Parish school. Participants were teacher-referred. Participating teachers provided a flyer with a brief description of the study and the investigator's contact information to the parents of children whom they felt were displaying excessive inattention/disruptive behaviors in the classroom. Of the 120 flyers distributed to parents, a total of 81 parents contacted the investigator to learn more about the study. After speaking with the investigator, all 81 requested that their child be enrolled. These 81 children were administered the WJ-III subtests and rating scales described below. Twenty-two of those children did not meet inclusion criteria and were therefore excluded from the study. Twenty-one did not meet criteria for ADHD diagnosis and one scored below average on the WJ-III. Of the 59 that did meet criteria for inclusion, 14 were randomly assigned to a treatment group for a related study. The remaining 45 were enrolled in the present study. All but 2 stayed in the study for its entirety. Those 2 participants were excluded mid-study due to lack of treatment integrity on the part of the teacher.

Diagnosis

The ADHD evaluation included the following questionnaires completed by the child's parent and teacher: Conners' Parent Rating Scale- Revised: Short Form (CPRS-R:S), Conners'

Teacher Rating Scale- Revised: Short Form (CTRS-R:S) (Conners, 1997). These rating scales are empirically based assessment measures of child behavior problems. The technical manual provides cut-off scores for each that indicate when a child's problems are clinically significant (T-score ≥ 70). All students included in the study earned a T-score of 70 or higher on at least one of the three subscales Hyperactivity, Cognitive Problems/Inattention, or ADHD Index as rated by both parent and teacher. Six students included in the study were not rated as having clinically significant problems by their parents. However, in all six cases, scores on teacher ratings were significant and classroom observation revealed on-task behavior less than 60% of the time.

Each child was observed for three 30-minute sessions on three different days and behavior was coded using the interval recording system described below. In order to be classified as displaying significant levels of off-task behavior, the mean levels of on-task behavior recorded during the three observations had to be less than 60%.

Also, three subtests of the Woodcock-Johnson Tests of Achievement - Third Edition (WJ-III; Woodcock, McGrew, & Mather, 2001) were administered to each child. All scores fell within the Low Average Range or higher, as defined by the testing manual (standard score >80). This was done to rule-out any major academic skill deficits that might have rendered the student unable to complete the classwork assigned.

Setting

The intervention was implemented in the classroom of each student. All classrooms were regular education classrooms in one of four inner-city public schools, each with one teacher and between 26 and 30 students. The students were observed in the classroom during the morning work period, during independent seatwork activities.

Design and Procedures

A between groups design with three treatment groups was used in order to compare the effects of no treatment (control), teacher feedback, and a school-home note for increasing children's on-task behavior and classwork completion.

Intake Interview/Assessment Procedure

Prior to data collection, parents were interviewed and the purpose of the study was explained. Parents were told that the effectiveness of the two classroom interventions was being evaluated. Informed consent was obtained (see Appendix A). After agreeing to participate, one parent of each child completed a demographic information form, a CRPS-R:S, and an ADHD Rating Scale (DuPaul, et al., 1998). In addition, the child's teacher completed a demographic information form, a CTRS-R:S, and an ADHD Rating Scale. Three classroom observations were conducted to determine pre-treatment levels of on-task behavior. Prior to the observations, each child was administered the three selected subtests of the WJ-III (Letter-Word Identification, Calculation, and Spelling) by one of the trained observers or the researcher. These three subtests comprise the Academic Skills Composite Score. To qualify for enrollment in the study, each student had to have an Academic Skills Composite standard score above 80 (9th percentile). After meeting inclusion criteria, each participant was randomly assigned to one of three groups using a table of random numbers. Once the baseline measures had been collected and the participants had been assigned to treatment groups, the study ran approximately five weeks.

Control Group

In addition to the three pre-treatment observations conducted during the intake/assessment phase of the study, the participants in the control group were observed for 30 minutes in their classrooms three times at the end of the first two weeks of the study and three

times after the following two weeks. Observations were conducted in the mornings during independent seat work time. On the days of observations, the observer collected each child's classwork for the morning and made photocopies. These copies were graded for percentage complete and percentage correct.

Teacher Feedback Group

The participants in the teacher feedback group were similarly observed and their work was also collected and graded. Each day during the treatment phase of the study, each participant retrieved a "behavior note" from a designated folder in the classroom and placed it on his or her desk first thing in the morning. The note contained four target behaviors. The child's teacher rated the student on each of those behaviors by circling either a "Yes," "So-So," or "No." A rating of "Yes" indicated that the student behaved within the normal range, "So-So" indicated that the student's behavior was marginally appropriate, and "No" indicated unsatisfactory behavior. The note also contained five smiley faces. The teacher instructed the student to cross off a face at every occurrence of off-task or disruptive behavior. The teacher verbally reviewed the note, specifically the behavior ratings circled, with the child before lunchtime using a script provided by the researcher. The note was then placed back in the folder by the student. No additional contingencies were provided. No additional instructions were provided to the teacher.

School-Home Note Group

The participants in the school-home note group, again, were observed and their work was collected in an identical manner to the other two groups. Each child placed a "school-home note," similar to the "behavior note" used in the teacher feedback condition, on his or her desk every morning. The child's behavior was rated by the teacher in the same manner as in the teacher feedback condition. The smiley faces were again crossed off contingent on misbehavior

in the classroom and served a response cost function. The student's teacher verbally reviewed the note with him or her before lunchtime, again using a script provided by the researcher. After receiving the verbal feedback, the child placed the note in a folder to be taken home in order to receive the contracted contingencies from his or her parents described below.

Prior to beginning the school-home note intervention, the parents and students assigned to this group were instructed in the use of home-based reinforcement and handouts explaining school-home notes were provided. Parents and children were shown and taught about the school-home note. It was explained that one note would be completed by the teacher each day and sent home with the child. A rating of "Yes" was worth 2 points, "So-So" was worth 1 point, and "No" was worth zero points. Also, each remaining smiley face was worth one additional point. The maximum number of points available on the note was 13 (4 ratings of "Yes" worth 2 points each and all 5 smiley faces remaining). The researcher assisted each family in constructing a contract outlining contingencies for reinforcement. The contract defined what constituted a "good note" and what rewards would be provided. For example, a student's contract might have specified that 9 points (2 ratings of "Yes," 2 ratings of "So-So," and 3 remaining smiley faces) must be obtained to receive reinforcement.

The child brought the note home daily, the parent reviewed the child's performance with him or her, determined if it met criteria for a "good note," and provided the proper rewards. The parent then indicated the reward earned (if any), signed the note, and returned it to school with the child in his or her homework folder. The following day the child replaced the previous day's note in the folder while obtaining a new note for the current day.

Dependent Measures

Observational Coding System

Student behaviors were coded using 15-second intervals. The coding system used was a modification of a method used by Pfiffner and O’Leary (1987). Each interval was coded as either on-task or off-task. The dependent measure was percentage of intervals in which the student was engaged in on-task behavior. An interval was coded as on-task if the student was engaged in appropriate, assignment-related activities for the full 15-second interval. An interval was coded as off-task if the student was not engaged in the assignment and his eyes or head was oriented away from the assignment for 3 consecutive seconds of the interval. As previously mentioned, observations were conducted in the morning during independent seatwork activities.

Observers were undergraduates blind to the purpose of the study. Training consisted of didactic instruction in the use of the coding system, discussion and modeling of examples of possible classroom behavior, and practice sessions in several elementary classrooms in which randomly selected students were observed and coded by two or more trainees at a time. Observers were required to obtain inter-rater reliability above 80% during the practice sessions before beginning to code the study participants.

Reliability

Reliability data for observations were collected for 20% of the sessions. Those sessions were coded by two observers and compared to ensure that reliability was maintained. An average of 93.30% agreement was obtained during training sessions (Range=86.90-100%) and an average of 96.00% (Range=89.29-100%) was maintained throughout the study.

Completed Academic Assignments

The percentage of classwork attempted as well as the percentage of work completed correctly during the morning work period was evaluated. On the days of observations, the observer collected each child's classwork for the morning and made photocopies. The copies were graded for percentage complete (number of items completed/number of items assigned) and percentage correct (number of items correct/number of items assigned). Both the student's teacher and the researcher graded each assignment independently to ensure reliability. The two graders were in agreement 100% of the time in all cases. The two dependent measures were the mean percent of problems completed and the mean percent correct.

Consumer Satisfaction

Teachers completed a brief consumer satisfaction interview with the researcher at the conclusion of the study. Questions for the interview were adapted from the Treatment Evaluation Inventory – Short Form (TEI-SF), which is a validated measure of treatment acceptability (Jones, Eyeberg, Adams, & Boggs, 1998; Miller & Kelley, 1994). The interview consisted of 8 questions rated on a 5-point Likert scale ranging from 1= “Strongly Disagree” to 5= “Strongly Agree.” The total score was calculated by summing the scores of all 8 responses (Range= 8-40). Higher scores indicate greater satisfaction with the intervention. Teachers who had students in more than one treatment group in their classrooms provided separate responses for each intervention. They were also asked to choose which treatment they preferred, which one appeared to be more effective in decreasing off-task and disruptive behavior, and which was easier to implement. They were also given the opportunity to comment freely.

Parents who had children in the school-home note group were informally questioned regarding treatment satisfaction over the phone at the conclusion of the study. They were simply given an opportunity to comment freely on how they felt about the intervention.

Treatment Integrity

To ensure that the teacher administered portion of the two interventions was consistently and properly implemented, a treatment checklist was completed by one of the observers during 20% of the feedback sessions for each student (4 sessions) in each of the two treatment groups. Each of the seven items was checked as correct if completed according to protocol. Steps not completed correctly resulted in the item being left blank. The percentage of treatment integrity for each feedback session was calculated by dividing the number of steps completed correctly by the total number of steps. The percentages of treatment integrity achieved during the four sessions were averaged to create a total treatment integrity score for each participant. Those students whose overall integrity was lower than 80% were excluded from the study. Using these criteria, two students, one in the teacher feedback group and one in the school-home note group, were excluded from the study. Mean percentage of treatment integrity in the school-home note group was 99%. Mean percentage treatment integrity in the teacher feedback group was 97%.

To ensure that the home-based portion of the school-home note intervention was consistently and properly implemented, a treatment integrity measure of parent participation was used in that group. Parents were required to report the reward provided each day by writing it on the note, sign the note, and return it to school with the child in his or her homework folder. At school, the child placed the previous day's note in the folder while obtaining a new note for the day. This process was monitored throughout the study by the researchers and undergraduate observers. If the previous day's note was missing from the folder, the researcher called the

parent and prompted them to continue sending the notes back to school. All parents met the treatment integrity criteria of 80% of the notes returned to school; therefore, no students were excluded from the study based on lack of appropriate parent treatment integrity. Mean percent of notes returned to school was 83%.

RESULTS

Participant Demographics

Characteristics of the 43 students who participated in this study and their families are presented in Table 1. All participants were African-American, 74% were male, 23% were on medication for ADHD at the time of the study, and 77% percent lived with a single mother. Grade distributions were as follows: 54% in first grade, 28% in second grade, and 19% in third grade. Family yearly incomes reported were below \$3,000 for 54%, between \$3,000 and \$14,999 for 24%, between \$15,000 and 29,999 for 14%, and \$30,000 or more for 5%. The mean number of years of education for mothers of the participants in this study was 11, representing an 11th grade education. Mean WJ-III Academic Skills Composite standard score for the students was 104. The mean pre-treatment parent-completed ADHD Rating Scale total symptom score was 34, and teacher-completed was 40. Mean percent of pre-treatment on-task behavior was 37%, classwork complete was 76%, and classwork correct was 56%.

One-way ANOVAs were conducted to ensure that the three treatment groups (School-Home Note Group, SHN Group; Teacher Feedback Group, TF Group; Control Group) were balanced in terms of the demographic variables gender, age, grade, ADHD medication status, marital status of mother, family income, education level of mother, WJ-III scores, and pre-treatment parent and teacher ADHD Rating Scale total symptom scores. Analyses revealed that there were no significant differences in any of these variables between groups.

Nineteen teachers participated in this study. All of them were female, 12 identified themselves as “black,” and 7 identified themselves as “white.” Ten teachers taught first grade classes, 5 taught second grade, and 4 taught third grade. Ten of the teachers who participated had bachelor’s degrees and the other 9 had master’s degrees. Ages of the teachers ranged from

Table 1. Characteristics of the Sample: Means, Standard Deviations, and Frequencies

Variable	Entire Sample (n=43)	TF (n=13)	SHN (n=14)	Control (n=16)	F stat F (2, 40)	significance level
Child						
<i>Age (years)</i>						
M	7.4	7.9	7.2	7.2	2.17	$p = .13$
SD	1.1	1.0	.8	1.2		
<i>Gender</i>						
male	32	11	10	11	.50	$p = .61$
female	11	2	4	5		
<i>Grade</i>						
1	23	5	6	12	1.65	$p = .20$
2	12	5	5	2		
3	9	3	3	2		
<i>ADHD meds</i>						
yes	10	3	4	3	.19	$p = .83$
no	33	10	10	13		
<i>WJ-III scores</i>						
M	103.8	104.3	104.1	103.2	.02	$p = .98$
SD	18.0	17.7	17.7	19.7		
<i>ADHD-RS-parent</i>						
M	33.8	39.5	35.2	27.6	3.10	$p = .06$
SD	13.4	11.9	9.1	15.9		
<i>ADHD-RS-teacher</i>						
M	39.7	37.0	39.9	41.9	.84	$p = .44$
SD	10.0	11.0	8.6	10.4		
<i>% on-task</i>						
M	36.9	35.0	35.9	39.4	.38	$p = .68$
SD	14.6	8.1	15.0	18.4		
<i>% work complete</i>						
M	75.8	73.5	80.1	73.2	.31	$p = .74$
SD	25.5	31.4	25.5	20.3		
<i>% work correct</i>						
M	56.1	49.8	56.8	61.3	.71	$p = .50$
SD	24.3	26.9	28.1	16.7		

(Table 1. continued)

Variable	Entire Sample (n=45)	TF (n=14)	SHN (n=15)	Control (n=16)	F stat F (2, 40)	significance level
Family (Mother)						
<i>Marital status</i>						
married	10	3	4	3	.10	$p = .91$
single	32	10	10	13		
<i>Income</i>						
Under \$3000	23	7	7	9	1.12	$p = .34$
\$3000-14,999	12	3	3	6		
\$14,999-29,999	6	2	3	1		
\$30,000 and up	2	1	1	0		
<i>Years of education</i>						
M	11.1	11.7	11.0	10.8	.98	$p = .38$
SD	1.7	1.2	1.2	2.4		

23 to 60 years ($M=35.1$, $SD=12.4$). Years of experience teaching elementary school ranged from 1 to 32 years ($M=8.8$, $SD=11.2$).

Preliminary Analyses

A repeated measures one-way ANOVA was run to determine whether pre-treatment percentages of on-task behavior during observations 1, 2, and 3 could be collapsed into one variable. Because the three did not differ significantly from one another, $F(2, 84) = .67$, *ns*, observations 1, 2, and 3 were collapsed into one variable. A one-way ANOVA was run to determine if the pre-treatment percentage of on-task behavior differed by group. Analyses indicated that there were no significant differences, $F(2, 40) = .38$, *ns*.

The same procedure was run to determine whether the three pre-treatment measures of percent classwork complete could be collapsed into one variable. Again, there were no significant differences, $F(2, 76) = .29$, *ns*. A one-way ANOVA was run on the collapsed variable of pre-treatment percent classwork complete, and again there were no significant differences between groups, $F(2, 36) = .31$, *ns*.

Finally, an identical procedure revealed no significant differences between the three pre-treatment measures of percent classwork correct, $F(2, 76) = .74$, *ns*, allowing them to be collapsed. A one-way ANOVA was run on the collapsed variable of pre-treatment percent classwork correct, and again there were no significant differences between groups, $F(2, 36) = .71$, *ns*.

Comparisons of pre-treatment and during treatment outcome measures by group are presented in Table 2.

Table 2. Comparison of Outcome Measures by Group:
Pre-Treatment (Pre) and Post-Treatment (Post) Means and Standard Deviations

Measure	SHN		TF		Control	
	Pre	Post	Pre	Post	Pre	Post
<i>% on-task</i>						
M	35.9	86.6	35.0	77.1	38.6	40.6
SD	15.0	6.8	8.1	13.1	18.7	17.3
<i>% work complete</i>						
M	80.1	94.4	73.5	96.5	73.2	69.3
SD	25.5	10.3	31.4	5.3	20.3	21.2
<i>% work correct</i>						
M	56.8	83.1	49.8	84.9	61.3	61.0
SD	28.1	15.5	26.9	12.2	16.9	25.0
<i>ADHD-RS teacher</i>						
M	39.3	28.8	37.4	26.8	42.1	40.4
SD	8.7	13.0	12.0	12.8	10.7	11.0
<i>ADHD-RS parent</i>						
M	36.3	25.2	41.3	34.8	28.3	31.9
SD	9.5	14.4	10.5	12.7	16.6	14.5

Observational Data

In order to determine if time of observation had a significant effect on percentage of on-task behavior during treatment, a repeated measures one-way ANOVA was run on the three observations conducted at the end of the first two weeks of treatment and the three conducted after the last two weeks of treatment. Because the six did not differ significantly from one another, $F(5, 205) = 2.13$, *ns*, observations 4-9 were collapsed into one variable for further analyses.

A split-plot ANOVA was run with treatment group as the between-subjects variable and pre-treatment and during treatment percentages of on-task behavior as the within-subjects variables. A significant main effect of treatment group on on-task behavior was found, $F(2, 39) = 11.40$, $p < .01$. A follow-up Tukey HSD showed that the percentage of on-task behavior in the control group ($M = 39.56\%$) was significantly different from both the SHN ($M = 61.21\%$) and TF groups ($M = 56.00\%$). However, there was no significant difference in on-task behavior between the SHN and TF groups. A significant main effect of time of observation (pre-treatment versus during treatment) on on-task behavior was also found, $F(1, 39) = 305.78$, $p < .01$. Pairwise comparisons using the Bonferoni procedure were run to follow-up. It showed that pre-treatment percentages of on-task behavior ($M = 36.45\%$) differed significantly from the percentages during treatment observations ($M = 68.06\%$) across all groups.

There was also a significant interaction between observation time and treatment group, $F(2, 39) = 71.86$, $p < .01$. A dependent, paired-samples *t* test using a Bonferoni correction was run to analyze the interaction of treatment group and time of observation (pre-treatment and during treatment) for each of the three treatment groups. Results showed a significant difference between the percentage of on-task behavior pre-treatment and during treatment for both the SHN

group, $t(13) = -14.99, p < .017$, and the TF group, $t(12) = -12.73, p < .017$. There was no significant difference between the pre-treatment and during treatment percentages of on-task behavior in the control group, $t(14) = -.74, ns$.

Independent samples t tests were run to determine if there were any significant differences in the percentage of on-task behavior between each of the two treatment groups during treatment. Results revealed that both the SHN group ($M = 86.56\%$), $t(18.45) = 9.52, p < .017$, and the TF group ($M = 77.05\%$), $t(26) = 6.21, p < .017$, had significantly higher rates of on-task behavior than the control group ($M = 40.56\%$). This confirms hypothesis #1, that both treatments were more effective in increasing on-task behavior than the control condition. Results of the third t test revealed that the percentage of on-task behavior in the SHN group ($M = 86.56\%$) was significantly higher than in the TF group ($M = 77.05\%$), $t(17.73) = 2.34, p < .017$. That is, the students in the school-home note group exhibited higher levels of on-task behavior than the students receiving the teacher feedback treatment. This confirms hypothesis #2, that the school-home note intervention was more effective in increasing on-task behavior than the teacher feedback intervention.

Academic Performance

Classwork Completion

In order to determine whether time during treatment had a significant effect on percentage of classwork complete, a repeated measures one-way ANOVA was run on the three assignments collected at the end of the first two weeks of treatment and the three collected after the last two weeks of treatment. Because the six did not differ significantly from one another, $F(5, 190) = .70, ns$, the percentages of classwork completed on assignments 4-9 were collapsed into one variable.

A split-plot ANOVA was run with treatment group as the between-subjects variable and pre-treatment and during treatment percentages of classwork complete as the within-subjects variables. A significant main effect of treatment group on percentage of classwork completed was found, $F(2, 36) = 4.28, p < .05$. A follow-up Tukey HSD test showed that the percentage of classwork complete in the control group ($M = 71.24\%$) was significantly different from the school-home note ($M = 87.25\%$). The teacher feedback group ($M = 84.97\%$) did not differ significantly from either the school-home note or control group. A significant main effect of time (pre-treatment versus during treatment) on classwork complete was also found, $F(1, 36) = 5.83, p < .05$. A pairwise comparison using the Bonferroni procedure showed that pre-treatment percentages of work completed pre-treatment ($M = 75.59\%$) differed significantly from the percentages during treatment ($M = 86.70\%$) across groups. There was no statistically significant interaction between observation time and treatment group, $F(2, 36) = 2.91, ns$. This does not confirm the portion of hypothesis #3 related to classwork completion that the two interventions would lead to increased classwork.

Classwork Accuracy

In order to determine if time during treatment had a significant effect on percentage of classwork correct, a repeated measures one-way ANOVA was run on the three assignments collected at the end of the first two weeks of treatment and the three collected after the last two weeks of treatment. Because the six did not differ significantly from one another, $F(5, 190) = .82, ns$, the percentages of classwork correct on assignment 4-9 were collapsed into one variable.

A split-plot ANOVA was run with treatment group as the between-subjects variable and pre-treatment and during treatment percentages of classwork correct as the within-subjects variables. No significant main effect of treatment group was found, $F(2, 36) = 1.02, ns$. A

significant main effect of time (pre-treatment versus during treatment) on classwork accuracy was found, $F(1, 36) = 19.73, p < .01$. A pairwise comparison using the Bonferroni procedure showed that pre-treatment percentages of classwork correct ($M = 55.96\%$) were significantly lower than the percentages during treatment ($M = 76.36\%$) across groups.

There was also a significant interaction between time and treatment group, $F(2, 36) = 5.30, p < .05$. A dependent, paired-samples t test using a Bonferroni correction was run to analyze the interaction of treatment group and time of assignments (pre-treatment and during treatment) for each of the three treatment groups. Results showed a significant difference between the percentage of classwork completed correctly pre-treatment and during treatment for both the school-home note group, $t(13) = -3.16, p < .017$, and the teacher feedback group, $t(11) = -4.35, p < .017$. That is, the percentage of classwork completed correctly increased significantly for both of the treatment groups. There was no significant difference between the pre-treatment and during treatment percentages of accuracy in the control group, $t(12) = .04, ns$. This confirms the portion of hypothesis #3 related to classwork accuracy. Both interventions led to increased classwork accuracy.

An independent samples t test was run to determine if there was a significant difference in the percentage of classwork correct between the two treatment groups during treatment. It revealed that there was no significant difference between the school-home note group ($M = 83.12\%$) and the teacher feedback group ($M = 84.93\%$), $t(24) = -.33, ns$. That is, neither intervention increased classwork accuracy more than the other.

ADHD Rating Scale

Teacher-completed

A split-plot ANOVA was run with treatment group as the between-subjects variable and teacher-completed pre-treatment and post-treatment ADHD Rating Scale total symptom scores as the within-subjects variables. A significant main effect of time (pre-treatment versus post-treatment) of completion of the rating scale on total symptom score was found, $F(1, 35) = 14.83$, $p < .01$. A follow-up pairwise comparison using the Bonferroni procedure showed that pre-treatment teacher-rated total symptoms scores on the ADHD Rating Scales ($M = 39.61$) were significantly higher than the total symptom scores at post-treatment ($M = 32.01$) across groups. There was no significant main effect of treatment group, $F(2, 35) = 3.25$, *ns*, and no significant interaction between time the scale was completed and treatment group, $F(2, 35) = 2.35$, *ns*. This does not confirm the portion of hypothesis #4 in which it was predicted that the total symptom scores as rated by teachers would decrease at post-treatment versus pre-treatment for the two groups receiving intervention. Rather, scores decreased post-treatment across all three groups.

Parent-completed

A split-plot ANOVA was run with treatment group as the between-subjects variable and parent-completed pre-treatment and post-treatment ADHD Rating Scale total symptom scores as the within-subjects variables. There was no significant main effect of time of completion of the rating scale, $F(1, 32) = 3.21$, *ns*, or of treatment group, $F(2, 32) = 2.03$, *ns*. There was also no significant interaction between time the scale was completed and treatment group, $F(2, 32) = 2.71$, *ns*. This confirms the portion of hypothesis #4 related to parent ratings. Scores did not decrease at post-treatment.

Consumer Satisfaction

Teacher Consumer Satisfaction

Mean total consumer satisfaction scores were calculated for each treatment group. Again, higher scores indicated greater satisfaction. The maximum score possible was 40. Teachers rated the school-home note intervention (M=32.67) slightly higher than the teacher feedback intervention (M=31.67). Anecdotal comments from the teachers suggested that they found both interventions were easy to implement. Several teachers commented that they appreciated the fact that the techniques were quick to implement and did not require that the teacher stop class to provide consequences to any one student, either positive or negative. All teachers who utilized the school-home note indicated that they were relieved that students were being rewarded at home, which took the responsibility off of them to provide consequences. One teacher added that she recognizes that a student's mother has more resources to reward with at home than a teacher has available in the classroom, which allows for more powerful reinforcers. The teachers made several suggestions as well. One suggested that rather than rating each of the target behaviors with "yes," "so-so," or "no," each target behavior be followed by several smiley faces such that each behavior has its own response cost. Another teacher requested that the note be individualized for each student to target behaviors identified as specific problem areas for that student. Of the 19 teachers that participated, four had students in both treatment groups in their classrooms. All four of these teachers noted that they preferred the school-home note intervention over teacher feedback. All four indicated that they felt the school-home note was more effective because rewards were provided at home.

Though the method of measurement of consumer satisfaction was not appropriate to run statistical analyses with, anecdotal data suggests that hypothesis #5 might be correct. No

conclusions regarding teacher treatment satisfaction of a school-home note versus a teacher feedback intervention may be made at this time.

Parent Consumer Satisfaction of SHN Intervention

At the conclusion of the study, the mothers of the students in the school-home note groups were briefly interviewed. They were simply asked what they thought of the intervention. Of the 14 mothers, each said she was thankful for the help the family received regarding the child's behavior. All reported that they felt the intervention helped reduce behavior problems in the classroom. Three indicated that they enjoyed seeing their children feel proud to show-off a good note. One mother asked that her child be allowed to continue bringing the note home for the remainder of the school year. Another mother asked that the researcher assist her in designing and implementing school-home notes for her other children in different classrooms. Most mothers stated that the treatment was easy to implement, with the exception of three who commented that it was difficult to keep "prizes" in the home to use for rewards.

DISCUSSION

The efficacy of two interventions for increasing the on-task classroom behavior and academic productivity of low-income, minority students with Attention-Deficit/Hyperactivity Disorder was compared. One group of students was exposed to a classroom-based treatment (teacher feedback) and one group was exposed to a home-based treatment (school-home note). Both were compared to a no-treatment control group. Both procedures utilized identical behavior notes that provided daily teacher feedback of student behavior via ratings of target behaviors as well as a response cost component for inappropriate behavior. The only distinction between the two notes is that one was sent home where structured rewards were provided contingent upon satisfactory behavior and one was not sent home and no consequences were provided.

The observational data showed that both interventions significantly increased the on-task behavior of the students during the observation sessions, as hypothesized. That is, both interventions were more effective than the no-treatment control group ($M = 40.6\%$). Also as hypothesized, the students in the school-home note group exhibited significantly higher rates of on-task behavior in the classroom ($M = 86.6\%$) compared to the students in the teacher feedback group ($M = 77.1\%$). This is not surprising considering that the teacher feedback group did not receive reinforcement for appropriate behavior, assuming that the teacher's feedback was not reinforcing to the child. Results are similar to those found by LaRowe, Tucker, and McGuire (1980). Feedback alone was effective in decreasing noise levels in an elementary school cafeteria; however, the addition of reinforcement for appropriate noise levels was significantly more effective.

Academic productivity data showed that percent of work completed did not increase significantly as a result of either treatment; however, percent of work correct was significantly higher in both treatment groups (SHN, M = 83.1%; TF, M = 84.9%) as compared to controls (M = 61.0%), as hypothesized. There was no difference between the percent of work completed correctly by participants in the school-home note and teacher feedback groups. Although there were no significant differences among groups in the amount of assignments completed, it is possible that a significant difference may be found if the relatively low power in the current study was increased. A significant interaction would have meant that at least one group of students completed a different amount of work than students in the other groups. The lack of a significant finding with regards to work completed might be due to lack of power in the study or variability. It may also be that the two interventions lead to increased accuracy of work that was already being completed, but perhaps not with the greatest effort of the student. Whatever the reason, it is important to note the percentages of classwork being completed by the children in the treatment groups during the treatment condition (SHN, M = 94.4%; TF, M = 96.5%). These percentages reflect an increase from pre-treatment classwork completed of 14% in the school-home note group and 23% in the teacher feedback group.

No significant differences in parent ratings on the ADHD Rating Scale between pre-treatment and post-treatment were found, as hypothesized. Home behavior, which was measured by the rating scale, was in no way targeted by either of the treatments. No generalization of behavior change achieved in the classroom to the home setting was expected. Therefore, no change in parent ratings was expected.

More surprising, perhaps, is that no significant differences were found among groups in the decreases in teacher ratings on the post-treatment ADHD Rating Scale as compared to pre-

treatment ratings. Rather, teacher ratings across all three groups decreased post-treatment. It is possible that inclusion in the study affected teacher ratings, which would explain why ratings decreased across all groups, not just the two groups that received treatment. Several factors might have contributed to the lack of decreases in teacher ratings. One is the fact that the notes (school-home note and behavior note) were only on the students' desks for the morning work period. Although increases in on-task behavior were noted during observation sessions, it is likely that there were no similar increases after lunch as the treatment was not in place in the afternoon. Another possibility is that the ADHD Rating Scale was not sensitive to the changes observed by the teachers. The length of treatment should also be considered. After observing the student for, in many cases, months prior to treatment, it is possible that a teacher's perception of the student is resistant to behavior changes observed for only 5 weeks.

Though no solid conclusions can be drawn with respect to consumer satisfaction, it appears that both treatments examined in the current study were found to be acceptable and effective by the teachers involved. Consumer satisfaction data, particularly the anecdotal data obtained via interview, show preliminary evidence that teachers are likely to find the school-home note to be a more satisfactory classroom intervention for children with ADHD than the teacher feedback intervention. Comments made by teachers indicate that they found both techniques to be quick and easy to implement. However, those that experienced both were clear in their preference for the school-home note, stating that they found it to be a more powerful intervention.

Informal information obtained through parent interview regarding consumer satisfaction of the school-home note intervention was consistently positive. All 14 mothers indicated that they felt the intervention helped their child and most added that it was easy to implement. These

comments are in line with previous research examining parent and teacher rated treatment acceptability and consumer satisfaction of school-home note interventions (Kelley & McCain, 1995; Power, Hess, & Bennet, 1995; Pisecco, Huzinec, & Curtis, 2001; Jurbergs, 2002). Another indication of consumer satisfaction is the high rate of treatment integrity exhibited by these parents. This study has shown that not only are low-income, minority mothers capable of implementing this treatment, they are likely to judge it to be acceptable and effective.

In contrast to the majority of the data that suggest the school-home note intervention is easy to implement, a more subtle anecdotal finding was that 3 mothers noted they found it difficult to keep the contracted rewards in the home. This has implications for the real-world utility of school-home notes. If consistency of providing the earned rewards cannot be guaranteed, the efficacy of the school-home note cannot be guaranteed. Budd et al. (1981) utilized a daily report card with home privileges to treat preschoolers with behavior problems. The authors noted that the lack of improvement in two of the participants may have been due to parental inconsistency in delivering consequences. In the present study, treatment integrity was ensured by prompting parents when notes were not returned to school with the child. In an applied setting such as an elementary classroom, however, consistency is not often monitored. Chafouleas, Riley-Tillman, and McDougal (2002) warn that home-based interventions may be contraindicated for children whose families are at high-risk of being inconsistent. They add that a certain skill-level, of teacher and parents, is necessary to implement a school-home note with integrity.

This leads us back to the other treatment examined in the current study. Clearly and not surprisingly, teacher feedback appears to be inferior to school-home note based on its significantly lower increases in on-task behavior during treatment. However, there are situations

in which the teacher feedback intervention might be more desirable and more useful than a home-based intervention. Students of families at risk of being inconsistent in providing contracted rewards may enjoy greater benefits from the teacher feedback intervention. At the very least, teacher-delivered feedback of daily behavior ratings on a classroom behavior note might be more effective than a school-home note that earns no consequences at home.

Inconsistency is the most obvious reason for the failure of a home-based intervention, but there are others. Parents may not be utilizing rewards that are actually reinforcing to their children, but rewards that they perceive to be desirable. Some care-takers may not be skilled enough to calculate the point values and determine whether or not a note meets criteria for a “good note.” Even more detrimental to the success of a school-home note than not rewarding appropriate behavior is rewarding inappropriate behavior.

There are factors other than parental consistency and integrity of implementing home-based rewards that likely contribute to the success of a school-home note intervention. If parents are simply not interested in participating in the school performance of their children, perhaps a teacher feedback intervention should be considered. In this study, for example, participants, though teacher-referred, were self-selected. They responded to the study flyer sent home by the classroom teacher. This illustrated that these mothers were concerned with and active in their children’s academic and behavioral performance at school. For every 2 parents that responded to the flyer, there was another parent who did not. It may be assumed that at least a portion of these did not contact the researcher because of a lack of such interest and involvement. Such parents would likely not be good candidates for a school-home note.

Considering that parent involvement in a child’s academic career is associated with success in school (Grolnick et al., 1997) and considering that lower income and less educated

parents are less likely to be involved in the education and school activities of their children (Hoover-Dempsey, Bassler, & Brissie, 1992) it would be beneficial to the children of these families to get the parents more involved in school activities through the implementation of a school-home note. However, when this is not possible due to family dysfunction or parental unwillingness, teachers should be prepared to target classroom behavior problems with an alternate intervention.

The primary goal of this project was to begin to dismantle the school-home note in an attempt to identify an effective classroom intervention that does not require parental involvement, but that does retain the teacher-valued benefits of the school-home note such as simplicity and ease. A number of classroom-based treatments have been proven to be effective in the literature including time-out, token economies, and response cost techniques (Kerr & Nelson, 1983; McGoey & DuPaul, 2000; McLaughlin & Williams, 1988; Northup et al., 1999; O'Leary & Becker, 1967). However, they have been judged to be less acceptable than school-home notes by teachers (Pisecco, Huzinec, & Curtis, 2001; Power, Hess, & Bennet, 1995). As treatment acceptability is recognized as a large contributing factor to treatment integrity (Witt & Elliot, 1985), the lower acceptability ratings do not bode well for use in real-world classroom settings. Though the current teacher feedback intervention may not be as effective in maintaining appropriate classroom behavior in students with ADHD as previously researched interventions, it may have a better chance of being implemented consistently by teachers. A less powerful treatment that is consistently implemented with integrity may be more effective than a more powerful treatment not implemented with consistency.

There are a number of teacher characteristics that would likely contribute to the successful use of either of the current interventions being examined. Willingness to complete

daily behavior ratings and consistency in providing the feedback on a daily basis are necessary for both treatments. The ability to provide accurate feedback, that is, accurate behavior ratings, is also essential.

This study has made several contributions to the existing literature on home-based treatment of classroom behavior. First of all, the sample used represents an under-studied population: low SES, minority children with ADHD. When measuring the impact of this study on current practice, several characteristics of this population 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 the school-home note procedure already enjoying empirical support in the treatment of middle-class, Caucasian children with attention 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.

Secondly, a new classroom intervention for increasing on-task behavior and academic performance that does not require home-delivered or teacher-delivered contingencies has been explored. The teacher feedback procedure implemented in this study has shown some promise as a treatment for low SES students with ADHD. The strengths of the intervention include not requiring the participation of parents and not requiring the teacher to provide further consequences, such as rewards. However, though the results of the current study suggest that teacher feedback might be an effective intervention, it is not likely to be as effective as interventions that incorporate rewards contingent upon appropriate behavior.

The limitations of the current study should be examined in an effort to put the findings into perspective, as well as to guide future research. The small number of subjects and less than

desirable power of this study limits the conclusions that can be made. A larger, more methodologically rigorous study should be conducted before solid conclusions regarding the relative efficacy of school-home notes and teacher feedback interventions can be made. Also, the homogenous nature of the sample prevents the ability to make generalizations to other populations beyond low-income, African-American elementary students with ADHD.

The diagnostic procedure used to identify ADHD in the referred students was not optimal. Though all participants met criteria for ADHD, comorbid disorders were not assessed for and were not ruled-out. As it is widely known that comorbid disorders are quite common in children with ADHD (AACAP, 1995), it is likely that at least a few of the 43 participants in this study had comorbid conditions.

The classwork outcome measure utilized to assess academic productivity was not standardized across students, classrooms, or grades. As this study was conducted in the naturalistic setting, it was not possible to manipulate the academic curriculum in each classroom. This might have contributed to the lack of significant findings in the analyses of classwork completion.

The method of measurement of consumer satisfaction was not methodologically sound and did not allow for statistical analyses of the data. Future studies should focus on designing better assessment tools for obtaining consumer satisfaction and social validity data in order to better compare parent, teacher, and student satisfaction of school-home note versus teacher feedback interventions.

One element of the teacher feedback intervention not explored in the current study is the effect of the quality and type of verbal feedback provided to the child. The researcher took care to ensure that the teachers not be punitive or reprimand the child while delivering the feedback,

though it is not clear that this was necessary. Examining the relative effects of positively, negatively, and neutrally delivered feedback should be an area of future research. Also, accuracy of teacher ratings of student behavior and the reliability of the ratings as compared to independent direct observation data should be explored. In future studies, the behavior ratings should be examined as an outcome measure in addition to observational and rating scale data.

Further dismantling of the teacher feedback intervention should be conducted to identify the essential components. For example, is the presence of the behavior note on the child's desk necessary? Does the note serve a prompting or reminder function for the child of what behaviors are being monitored by the teacher? Would feedback be equally as effective if it were only given in the form of verbal statements at the end of the designated class period? Is the verbal feedback necessary if the note is on the desk, or is the presence of the note sufficient?

The efficacy of the current treatments in combination with pharmacotherapy is also a relevant area of investigation as many students with ADHD are treated with medication.

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APPENDIX: CONSENT FORMS

PARENT CONSENT FORM

- 1. Study Title:** A Relative Comparison of Teacher Feedback, School-Home Notes, and School Based Rewards In Minority Elementary School Students with Attention-Deficit/Hyperactivity Disorder
- 2. Performance Sites:** Children and their parents will be recruited on a voluntary basis from East Baton Rouge Parish schools.
- 3. Names and Telephone Numbers of Investigators:** If you have questions concerning this form or the study, please contact Mary Lou Kelley, Ph.D., Niki Jurbergs, and Jenny Palcic 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 the Study:** The purpose of this study is to evaluate two classroom interventions for elementary school students with ADHD. We will look at the efficacy of home and school based rewards procedure. We want to know which one would work better to help your child pay attention in class and complete more of his or her classwork. Your child's behavior in the classroom and his or her classwork will be studied.
- 5. Subject Inclusion:** Children participating in this study will be in grades one through three, attend an East Baton Rouge Parish school, possess average academic abilities, display significant disruptive or inattentive behavior in the classroom as reported by the teacher, and will have a diagnosis of ADHD.
- 6. Number of Subjects:** 60
- 7. Study Procedures:** First, you will be interviewed and your child will be evaluated for ADHD. The evaluation will consist of a teacher interview, a classroom observation, and questionnaires. You will be asked to fill out two questionnaires asking about your child's behavior at home and at school. Your child's teacher will fill out similar questionnaires. If your child meets criteria for ADHD, you will be invited to continue participating in the study.

Over a period of two months, 1-2 days per week, the investigator and several research assistants will grade your child's classwork for completion and accuracy as well as observe your child and your child's teacher in the classroom. Your child will be randomly assigned to one of four groups: control group, teacher feedback group, classroom note group, or school-home note group.

In the control group, your child will simply be observed and no treatment will take place. You will not be asked to do anything. In the teacher feedback group, your child's teacher will rate his or her behavior in the morning, and give verbal feedback based on those ratings. You will not be asked to do anything. In the classroom note group, your child's teacher will rate his or her behavior in the morning, give verbal feedback based on those ratings, and reward your child based on his or her behavior. The investigator will work with the teacher to establish what constitutes a "good note" and what type of rewards the teacher will give to your child. You will not be asked to do anything. In the school-home note group, your child's teacher will rate his or her behavior in the morning. The note will be sent home for you to provide rewards based on your child's good behavior for the day. The investigator will work with you to establish what is a "good note" and what sort of rewards your child should be able to earn. You will be asked to review your child's note daily, provide the specified reward, sign the note, and send it back to school.

8. Benefits: Possible benefits of participating in this research project include increases in your child’s classwork completion and an improvement in his/her classroom behavior. 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.

9. Risks/Discomforts: It is possible that your child will not appreciate the interventions being used in this study. He or she may be the only child in the classroom participating in the study and this may make him or her feel different from the rest of the children in the class. 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).

10. Right To Refuse: Participation in this study is voluntary, and your child will become part of the study only if you and your child both agree to participate. You or your child may change your mind and withdraw from the study at any time without penalty or loss of any benefit to which you may otherwise be entitled.

11. Privacy: The information gathered on you and your child will be kept confidential. Neither of your names will appear on any of the questionnaires or any other information. Your child will be identified by a code rather than a name. Any records with your name or your child’s name will be maintained in a locked file cabinet in the home of one of the researchers of this study, Jenny Palcic. Subject identity will be kept confidential unless release is required by law.

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

13. Alternatives: If you and your child decide not to participate in this study or decide to withdraw at any time, it is possible that your child may benefit from other treatment for ADHD. You should consult a school guidance counselor, child psychologist, or pediatrician in order to learn more about these treatments.

14. Signatures:

“This study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects’ rights or other concerns, I can contact Robert C. Matthews, Chairman, LSU Institutional Review Board, (225) 578-8692. I agree to participate in the study described above and acknowledge the researchers’ obligation to provide me with a signed copy of this consent form.”

Signature of Parent/Guardian

Date

“The study subject has indicated to me that he/she 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

CHILD ASSENT FORM

I, _____, agree to be in study to find ways to help children act better in school. A researcher will watch me in class on some days and will grade my classwork. My teacher may give me notes that tell me how I acted in class. Either my teacher will tell me how I did each day, and either give me rewards or not; or I will bring the note home and my mom or dad will look at the note, and then give me a reward. 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

VITA

Nichole Jurbergs earned her bachelor's degree in psychology from the University of Tennessee at Knoxville, graduating *Magna Cum Laude* in May 2000. She earned her master's degree from Louisiana State University in May 2003. She is currently a doctoral candidate in the clinical psychology program at Louisiana State University and plans to graduate in December 2005, after completing her predoctoral internship at the Mailman Center for Child Development at the University of Miami School of Medicine. She will begin a postdoctoral fellowship at St. Jude Children's Research Hospital in Memphis, Tennessee, in the fall of 2005. Nichole's clinical and research interests include classroom interventions for students with ADHD and pediatric psycho-oncology.