Reviews of Single Subject Research Designs:

Applications to Special Education, School Psychology, and School Administration

Edited by
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And

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Copyright Protection

The research reviews in this document were written by graduate students in the School Psychology Educational Specialists Program, the Exceptional Student Education Doctoral Program, and the Educational Administration Doctoral Program in partial fulfillment of the requirements for EDP 7058: Behavioral Interventions Research and Evaluation [Professor Ann Nevin] at Florida International University, College of Education, Department of Educational and Psychological Services, Miami, FL, Spring 2005.

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Introduction

By

Dr. Ann Nevin, Visiting Professor, Florida International University
Professor Emerita, Arizona State University

During the Spring, 2005, semester at Florida International University, graduate students in the Educational Specialists Program in School Psychology, Exceptional Student Education Doctoral Program, and the Educational Administration Doctoral Program joined together to study how single subject research designs might be a useful method to apply as part of being accountable to their respective clients. They embarked on this formal study by enrolling in an advanced graduate course entitled, *Behavioral Interventions Research and Evaluation.*

The result is this document of preliminary reviews of the literature, featuring single subject research designs. The authors evaluated the single subject research studies in accordance with the following criteria: Was the study applied, behavioral, reliable, analytic, effective, and generalizable? All of the reviews have been checked for accuracy in two ways. First, each author received feedback from the professor. After each feedback session, authors then revised their papers.

The topics represent a range of interests emerging from the individual author's background, experience, and curiosity. The importance of the topics is reflected in their reasons for uncovering the impact of various specialized interventions in terms of effects on special populations (e.g., students with Oppositional Defiance Disorder, children with emotional and behavior disorders, individuals with autism and autism spectrum disorder, children who watch too much television, and so on. The types of interventions that were critiqued include parent training programs, reinforcement, positive peer reporting, social story. The types of single subject research designs included reversal, multiple baseline, alternating treatment, and changing criterion designs.

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It is a privilege to present the literature reviews to the wider community of educators so as to ensure that all of our clients might experience more and more elegant accountability measures. It's been a privilege to coach these graduate students as they learned to conduct a critical examination of good single subject research. Special gratitude is extended for the countless acts of kindness that were exchanged during this process.

Much have we learned from our teachers, more have we learned from our peers, but most have we learned from the students and clients.

Ann I. Nevin, Ph. D.

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Ann Nevin, author of books, research articles, and numerous chapters, is a scholar and teacher educator who graduated *magna cum laude* from the University of Minnesota with a Ph.D. in Educational Psychology. Her doctoral research focused on how teachers and administrators can integrate students with special learning needs. She earned advanced degrees in special education and educational administration and has participated in the development of innovative teacher education programs since the 1970s. Her research with colleagues in the Vermont Consulting Teacher Program used single subject designs to document the impact of various interventions to increase the academic and social progress of children with disabilities in general education classrooms. Dr. Nevin has co-authored several well-recognized books, e.g., *Collaborative Consultation* (PRO-ED) and *Creativity and Collaborative Learning* (Brookes Publishing Company). Her most recent book (*A Guide to Co-Teaching: Facilitating Student Learning*, published by Corwin Press in April 2004, and co-authored with Jacqueline Thousand and Richard Villa) illuminates the power of co-teaching. Her advocacy, research, and teaching spans more than three decades of working with a diverse array of people to help students with disabilities succeed.

PARENT TRAINING

The Effects of Parent Training Programs on the
Behavior of Children with Conduct Problems

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Inclusion of children with special needs in regular education classes is becoming more prevalent, particularly with the reauthorization of Individuals with Disabilities Education Act (IDEA, 2004). School psychologists, exceptional education teachers, counselors and classroom teachers, along with parents, are increasingly working collaboratively to implement behavioral interventions for students with learning and/or behavioral problems in the classroom. Since non-clinic population samples indicate that between two and nine percent of youth show characteristics of conduct disorder (Brunk, 2000), it is safe to say that classroom teachers are faced with these behaviors on a daily basis. Much of the research indicates several facts regarding conduct problems. First, there is a broad range of behaviors that constitute conduct problems in school-aged children, from noncompliance to aggression. Second, young children who exhibit behavior problems frequently grow into adolescents with more severe conduct issues such as bullying, truancy, vandalism and theft. These behaviors are often precursors to more severe forms of antisocial behavior in adults (McMahon & Wells, 1998). Third, any classroom teacher can attest to the disruptive nature of students with conduct problems such that academic endeavors become secondary, if not for the entire class, certainly for the student in question.

Braithwaite, Duff and Westworth (2001) outline two basic subtypes of conduct disorders described in the DSM-IV. Childhood-onset is described as evidence of at least one criterion characteristic prior to age 10. It is these individuals who are likely to continue to exhibit oppositional and antisocial behavior throughout adolescence and adulthood. Children with adolescent-onset type, on the other hand, do not exhibit evidence of conduct disorder before age 10 and are able to maintain more typical peer relationships with less aggressive behaviors. This should by no means be construed as easy to interact with, however.

According to Webster-Stratton, Reid & Hammond (2004), data suggests that between 10% and 25% of children of preschool or early school age have aggressive conduct problems. Furthermore, without some sort of intervention, these children are at greater risk of learning difficulties, delinquency and more severe antisocial behaviors (Reid, Webster-Stratton & Baydar, 2004).

While temperament and early Attention Deficit Hyperactivity Disorder seem to be significant risk factors for conduct problems (McMahon & Wells, 1998), parenting practices such as coercive interactions and harsh discipline with little positive interaction appear to contribute as well (Braithwaite, Duff & Westworth, 2001). As a result, a significant focus for treatment of conduct disorders has been on parent training programs. This literature review will describe and critique several single-subject design studies that examine parent training programs used with preschool or early school-aged children with conduct disorders. After conducting a search of single subject design studies involving parent training programs for individuals with children with conduct or behavioral issues, several studies were identified as most closely fitting the requirements.

Literature Review

Two studies of parent training programs for pre-school or early school-aged children with conduct disorders taught parents to apply techniques to teach compliance (Marchant, Young, & West, 2004; Ducharme, Spencer, Davidson, & Rushford, 2002). Other types of parent training programs included communication behavior support (Delaney & Kaiser, 2001) and a combination of effective instructions, positive reinforcement and response cost for noncompliance (O'Reilly & Dillenburger, 2000). The following is a critique of these studies.

Marchant, Young & West (2004) investigated how effectively parents learn and apply various techniques with noncompliant children in the home. Marchant, et al maintained that noncompliance, which can often escalate to conduct problems and antisocial behavior in adolescents, results from poor parenting skills, specifically lack of discipline and supervision. Furthermore, parents desire to be taught more effective parenting skills. With this in mind, they designed a multiple baseline study that included baseline, training, coaching and follow-up phases with four Caucasian families and their four-year-old children (3 boys enrolled in Head Start, and one girl enrolled in a special education preschool program in the local public school). The observations were conducted by independent observers unaware of the purpose of the study. These observations took place in the child's home1-3 days per week for 30 minutes each day during the afternoon when the child returned from school. The following variables were measured:
1) The child's use of the 4-step compliance skill;
2) Parent behaviors (which subsequently became the intervention)
a. effective praise
b. instructive praise
c. direct teaching
d. corrective teaching
Parents and children were observed interacting with the parent giving instructions and the children's level of compliance to those instructions. Parents were then given a two-hour training session on the four parent behaviors during which time the parents were able to build a relationship with the coach and receive feedback on the use of the skills. A reinforcement chart was set up for each child during this phase as well. Children were trained on the 4-step compliance skill.

The results were that parents' use of teaching and praising skills increased from an overall mean of 1.3% to an overall mean of 84% as a result of training sessions, and continued to increase to 95% during the follow-up. Likewise, the children's overall compliant behavior increased from 31% to 91% from baseline to follow-up. Marchant, et al. concluded that a parent's use of a skills-based approach along with a reinforcement system can result in a positive change in a child's behavior. It appears that the new parenting behaviors were naturally reinforced after the training. This indicates generalization AFTER the training.

While this study was both reliable (interobserver agreement during training and feedback phases had a mean of 96%) and valid (a treatment verification checklist was used to avoid treatment drift), it would be beneficial for school personnel to modify the methods so that they are less cumbersome and time consuming. Also, generalization to the school setting would be worthy of study. Furthermore, because an AB design only establishes that a change occurred, a stronger design such as a multiple baseline across settings might establish functionality and stimulus control of the intervention.

Another study employed a program called Errorless Compliance Training. Similar to the previous study, Ducharme, Spencer, Davidson & Rushford (2002), investigated the effect of parent training on the improvement of child compliance in the home. However, the parents in this case had all experienced traumatic brain injury (TBI). The research of Ducharme, et al. indicates that the majority of families with one parent with TBI have children with behavioral problems, albeit often minor. They go on to say, however, that even minor behavior issues frequently result in mistreatment of the children by the parent. Thus, parent training to effect change in the child's acting-out behaviors is of particular importance.

The multiple baseline study involved 12 oppositional children of 8 parents with TBI. Child compliance to four levels (ranging from high degree of compliance to high degree of noncompliance) of requests was measured, as was parent self esteem. This particular approach was deemed appropriate for this population for several reasons: 1) this method eliminates the need for punishment; 2) the focus is on the successes of the child; 3) it is relatively simple for the parents to learn and implement, as well as being designed to reduce parent stress and frustration. Interobserver agreement was reported at an overall average of 92% for baseline and 93% for treatment.

Prior to the treatment phase, requests were categorized hierarchically determined by the likelihood of child compliance. Level 1 requests were requests that were likely to result in compliance (75% of the time or greater), and Level 4 requests were requests that were likely to result in noncompliance (75% of the time or greater). These requests were introduced during successive phases in the study, with transition phases between each level where requests from both phases were interspersed. Because children were gradually introduced to higher level requests, they were likely to comply without the need for constraining consequences such as time-out.

Significant improvement is evident when looking at the data of each level individually. Level 1 requests had baseline levels of compliance at an already high 85%, with 79% during treatment. Level 2 requests improved from 68% to 84% from baseline to treatment. More significant, however, are percentages of compliance on Level 3 requests (from 50%-88%) and Level 4 requests (from 25% to 79%). Overall mean compliance at follow-up was 83%.

Since this method of treatment is relatively simple to learn and implement, it seems to have been well suited to the parents with TBI. Its simplicity might also lend itself to use by parents of low socio-economic status (SES) with limited education, a population also characterized by high stress, few positive parenting strategies, and a cycle of negative parent-child interaction (Kumpfer & Alvarado, 2003).

Another program designed to improve behavior problems in young children is Blended Communication and Behavior Support (BCBS) as described by Delaney and Kaiser (2001). This intervention was designed to teach parents how to help their preschool children improve their communication skills along with their behavior. The study involved four children and their parents from low SES. All the children exhibited language delays and behavior problems. In short, the goal was to increase both the quantity and the quality of verbal parent-child interaction. The parents were instructed as to specific strategies for interaction with their children so to prevent more serious learning and behavior problems. Measurement, conducted by research assistants was

based on the frequency with which implementation of those strategies took place and the resulting percentage increase in behavior and communication on the part of the child. All training sessions and parent-child play sessions took place at the child-care centers located in low SES neighborhoods in the inner city. A mean interobserver agreement was demonstrated at 88% for parent behaviors and 91% for child behaviors.

While moderate improvements were evident as a result of treatment, some limitations in this study exist. First, the treatment took place in the childcare center, and only the generalization probes took place in the home. Second, the authors themselves state that no long-term changes were assessed. Third, the attempt to code multiple aspects of both parent and child behaviors made data collection difficult. Finally, changes in parental behavior were highly variable, possibly due to the scope of the intervention and the number of strategies for the parents to learn in a relatively short period of time. While reduction in noncompliant behaviors was measured in all of the children during intervention (less so during the generalization probe phase in the home), the structure of the study may have itself provided an intervention (parents did not usually have one-on-one time with the child to play) and under these circumstances the children did not exhibit noncompliant behavior to a great degree. Language performance improved only slightly, possibly due to the brief duration of implementation of all of the language strategies.

The final study in this literature review is actually two stages of a study by O'Reilly and that trained parents in the implementation of a high-intensity program to Dillenburger (2000) treat moderate to severe conduct problems in the home. The first stage was an A-B design on one six-year-old boy. Data on the rate of parent instruction and positive reinforcement were collected as well as percentage intervals of child aggression…"punching, slapping or kicking" (O'Reily & Dillenburger, 2000), aversive behavior (not clearly defined in the study), and noncompliance (which includes whining and inappropriate behavior). Of note in this study is the natural environment in which the training and intervention were conducted. Reliability of this study is debatable because there is no mention of interobserver agreement and incidents of physical aggression are solely based on the mother's self-report.

In the first study the results show that both parent and child behaviors changed as a result of the intervention. Effective instructions, positive reinforcement, and the use of the response cost to noncompliance all increased. Furthermore, both aggression and noncompliance were reduced to zero by the follow-up phase.

There were important differences between study 1 and study 2. In study 1, the response cost to noncompliance was the removal of a smiley-face sticker. In study 2, the second intervention phase included time-out on a chair for a set period of time. During study 2, physical restraint was necessary on two occasions with the child in family 2. This involved actually calling the father home from work to physically restrain the child on the bed until he agreed to go to time-out. On another occasion an example of extreme aggression that was exhibited included the child threatening the mother with a kitchen knife and damaging a door in response to being sent to time-out. Ultimately both children accepted time-out effectively. The use of time-out at all as part of parent training programs for children with behavior problems is somewhat controversial. Some maintain that it is tantamount to punishment and that positive parent-child interaction (the development of which results in less noncompliance on the part of the child) suffers. The authors go on to state in

conclusion that although this particular program is rather costly, the long term consequences of not offering these interventions to families is greater still.

Conclusion

Despite the sluggish pace at which research-based family interventions have been implemented, it is important to remember that effective, positive parenting is the most significant way to reduce (or better yet avoid) problem behavior in children (Kumpfer & Alvarado, 2003). The studies critiqued here demonstrate the positive effect of parent training on the behavior of young children (primarily preschool age) in the home as well as the feasibility of using single subject research designs with parents. While the literature suggests that preschool aged children are at greater risk as well as being more likely to be successful with interventions, the current situation in many elementary, middle and high schools indicates a need for intervention with these students as well. Early-onset conduct problems occur until age 10, yet few studies were found that deal with children older that six or seven years of age. Not only might there be success with adolescent onset conduct disorder, but early-onset that has not been addressed may be successfully reduced with appropriate parent training intervention.

Research Question

These studies raise the question: Can these improvements in child compliant behavior, demonstrated in the home setting, carry over to the classroom setting?

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Monitoring Children's Television Viewing

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Children in the United States watch, on the average, 27 hours of television per week (Thompson & Austin, 2003). Literature regarding the effects of what can be considered optimal viewing of currently available television programs has indicated that children may be affected in many ways, although the extent of television's direct influence on child development is still unknown (Razel, 2001). Children who watch greater amounts of television perform poorly on reading tests and homework completion, suggesting an inverse relationship between heavy viewing and school achievement (Anderson, 2001).

Wells and Blendinger (1997) support the finding that children watch too much TV and read too little. The study that they conducted included one teacher and a university professor, who worked together as action researchers, investigating 75 fifth grade students in a semi-rural school in Mississippi, with below-average academic achievement. The purpose of the study was to find out how those students spent their time when not in school. They used what they self-described as a descriptive case study research design. The instrument used to collect data was specifically designed to gather information about how children spent time outside the school Monday through Sunday. It was given to the students for one week. It included 10 exclusive activities and a "other" to give them chance to list extra activities that were not included. Icons with pictures next to the questions were included in order to help those students with learning difficulties. The form for weekdays and the one for weekends were slightly different: the one for weekdays had one time hour periods with on hour intervals, ranging from 3:00 p.m. to 9:00 p.m.; the one for the weekends had larger time blocks. To assure consistency with data collection, the authors kept a specific written protocol. The data collected was analyzed by tabulating the number of times the children reported with the activities. Each activity was given a proportional value by dividing the tabulated total for each of the activities by the total number of all the activities, not including the "other" category.

The relationships between TV viewing and academic achievement, age, home environment, and other variables are complex, multidimensional, and inconclusive (Razel, 2001). By analyzing the literature that examines the relationship between amount of television viewing and educational achievement, the researcher found there was not a consistency in providing an answer to the question of what the relationship was. Razel (2001) examined that relationship in a meta-analysis of data reported in studies of educational achievement. Each of those studies contained data on educational achievement of various age cohorts, geographical entities, and school subjects; they also contained data regarding the amount of television viewed by the students whose achievement were tested. After analyzing the research on the relationship between viewing and achievement for 13 different ages, ranging from 5 to 17 years, Razel (2001) clustered them in 3 groups and computed average correlations for each age group. Whether that relationship is negative or positive, depends on the age of the child: at ages 5 and 6, the average correlation between television viewing and achievement is positive, and for ages 7 through 9, the average correlation is negative; and for ages 10 through 17, the average correlation is even more negative. From those findings, Razel (2001), concluded that an optimal viewing time exists, that is, a viewing time for which a larger or a smaller amount are both related to lower achievement, optimal viewing

time decreases with age. In other words, whereas at age 9 optimal viewing time was estimated at 2 hr per day, at age 13 it was 1.5 hr a day, and at 17 it was .5 hr a day.

Preliminary findings are that positive television viewing has the potential to enhance reading comprehension skills for younger children (Razel, 2001; Van den Broek, 2001). Anderson, Huston, Schmitt, Linebarger, and Wright (2001) conducted a correlational study over a span of more than 10 years, where they associated higher grades and the reading of more books with positive television viewing. They mentioned 'third variables", like family characteristics, that could have affected both media use and behavior. They included control for parent education, family structure, and sites, to reduce the possibility that the results were a function of those family characteristics, even though they mentioned that unmeasured variables could have always been a potential factor.

Van Den Broek (2001) conducted a research with a longitudinal study on the effects of television viewing on the development of literacy and reading comprehension skills. They tested 28 pre-school, 4 year-old students (out of 120 targeted), and 95 first grade, 6 year-old children (out of 120 targeted). They were all recruited in the Twins Cities area of Minneapolis, Minnesota, through local schools and also through a "pool" of parents of pre-school children. Among their purposes for the research, was to investigate, within individuals, whether television comprehension scores are related to performance on vocabulary and story comprehension. They also wanted a basis for their longitudinal study on the relationship between pre-reading television program comprehension and late on, reading comprehension.

Van den Broek conducted all testing in a room in the psychology building at the University of Minnesota. They had viewing and testing area with television, video cassette players, and a camera. The sessions were about one hour long. The participants viewed television programs, and then completed comprehension tasks and early-literacy rests, like a Familiarity Test, the Picture Peabody Vocabulary, a Sequencing Memory task, an Aural Comprehension Task, a Dibel Test, and a WRMT-R Letter Identification Task. Both groups of children performed better on the television memory than on the aural story memory and comprehension. The correlation between both was .81. The correlation on the memory and recall tasks had a correlation of .97. It should be pointed out that the television show that the students watched was *The Rugrats*, which is very popular with children.

According to Eastman (2001), parents and educators must not be afraid to make a TV plan with children, based on the following suggestions: Parents should require that homework and chores be completed before children partake in the pleasures of recreational TV. They must demand that children engage themselves in individual reading and family socialization time away from the television set. It is prudent to mandate that children include so many hours of informational programming into their viewing diet. Children under four years of age should have little or no exposure to violence. A certain amount of viewing should be done together as a family. It is recommended that TV time be turned into thinking time. Talking and thinking about TV viewing helps to reduce its negative impact.

Summary

To summarize, the research appears to be saying that high levels of unsupervised mindless television viewing, especially when it is done instead of daily reading or other academic stimulation, can have the potential to cause harmful effects on achievement. The utilization of informational television, both in and out of the classroom, can have a positive impact on student achievement if properly channeled.

Research Question

A method for assisting parents who wish to decrease their child's excessive television viewing, and possibly to increase desired alternative behavior as a choice or alternative will be investigated, researched, and implemented.

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ACADEMIC BEHAVIOR

The Effects of Peer Interactions and Positive Peer Reporting on Academic Achievement

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Academic success in school has been related to the emotional development of children, starting as early as preschool. This study tries to develop the idea of emotional intelligence being associated with academic achievement through things such as interactive peer play and positive peer reporting to strengthen and increase positive social interactions and involvement. Interactive peer play and positive peer reporting has assisted in the development of preschool children. Positive peer reporting used briefly everyday may improve social interactions, peer acceptance, and social involvement among children (Moroz & Jones, 2002).

Teachers have been found to be better resources than other observers for identifying positive peer interaction behaviors as well as recording positive peer reporting (Moroz & Jones, 2002). After implementing programs to increase reports of prosocial behaviors, teachers are surprised at how much and how often their students helped each other (Cashwell, Skinner & Smith, 2001). With positive peer reporting, teachers reported that overall experience of the students in their classrooms, including those students being studied, was viewed positively (Moroz & Jones, 2002).

Examples of single subject designs that link positive peer reporting and pro-social behavior to academic success is difficult to find in current research. Databases such as ERIC have been helpful in finding the articles used in this study with search terms such as; social development, emotional development, peer reporting, peer interactions, academic achievement, and preschool. The best example in single subject research is the relationship between social skills instruction and improved academic engaged time as reported by Lane et al. (2003). However, it does not directly link positive peer reporting and pro-social behavior to improved academic achievement.

Statement of the Problem

The purpose of this study is to correlate peer interactions and positive peer reporting with high levels of academic achievement. Recent studies have shown that increasing a child's positive social interactions will also increase the amount of academic engaged time (Lane et al., 2003). These increases in positive social interactions and academic engaged time are associated with "lasting decreases in both disruptive behaviors in the classroom and negative social interactions on the playground" (Lane et al., 2003).

Review of Related Literature

Positive Peer Reporting (PPR) helps to shape behavior and is the opposite of tattling, students are given the chance to earn reinforcers, such as tickets or free time, for reporting positive behaviors of their classmates. Results of PPR show lower levels of negative social interactions and higher levels of positive interactions, and peers rate the students more favorably after the intervention. Participants view this intervention positively; however, each student individually responds differently and uniquely to PPR (Moroz & Jones, 2002).

In the research conducted by Moroz and Jones (2002), they used a multiple baseline across participants to see the effects of positive peer reporting on children's social involvement. The study implemented PPR in three rural classrooms and evaluated its effects during the student's 30-minute recess periods. In each of the classrooms the teachers implemented the PPR and had a "star" of the class, who was the participant, be observed by the other students. The subjects were three socially withdrawn children as recommended by the teachers in the different classrooms. Social involvement was observed and measured by using the Social Withdrawal Observation Form (SWOF) during the 30-minute recess periods. Results showed and increase in social involvement and suggest a brief daily session of peer praise may improve the social interactions, peer acceptance, and social involvement of students (Moroz & Jones, 2002).

Cashwell, Skinner, and Smith (2001) refer to positive peer reporting as tootling. Tootling is like a form of tattling except that the peer reports of other classmates' incidental behaviors are for prosocial behaviors. When tootling, students will report the prosocial behaviors and positive interactions of their classmates, as opposed to any anti-social behaviors or negative interactions on the playground (Cashwell, Skinner, & Smith (2001). By teaching students how to tootle effectively Cashwell, et al. (2001) found that students were more likely to engage in prosocial behaviors and less likely to engage in antisocial behaviors. They also found that students were more aware of different prosocial behaviors, respected other students when they displayed these behaviors, and overall had a more positive view of other students.

Cashwell, et al. (2001) used an ABAB withdrawal design to demonstrate the direct instruction for students to write good things or tootle about other students to help increase prosocial behaviors. The study included a 2nd grade classroom with 17 students and 1 teacher in a rural intact classroom. Students were shown by the teacher what prosocial behaviors were; who the other student was, how they helped, and what other student they helped. The students were then instructed to write tootles or good things that other students have done on an index card and place them into a box to be reviewed by the teacher. The teacher and researchers then collected the tootles and displayed the cumulative number on a ladder to show how many tootles the classroom had done as a form of progressive feedback. The results of this study showed that direct instruction could help students to report (tootle) the prosocial behaviors of other students in the classroom. Also, the tootling program helped to increase and maintain the prosocial behaviors of the students (Cashwell, et al. (2001).

Lane, et al. (2003) evaluated the amount of negative social interactions on the playground and the amount of disruptive classroom behavior by introducing social skills interventions. Lane, et al. (2003) also examined how much academic engagement improved as a result of the social skills interventions. Social skills instruction improved social competence by decreasing the amount of disruptions in the classroom and improved the social interactions on the playground (Lane, et al., 2003). The instruction that the students received on social skills and the increase in social interactions was associated with the improved academic engaged time of he students in the classroom (Lane, et al., 2003).

A multiple baseline across-intervention-groups was used by Lane, et al. (2003) to verify how effective social skills instructions were for elementary age students identified as at risk for antisocial behaviors. The subjects in this study included a range of 7 elementary students at risk for antisocial behaviors in a rural elementary school. The students were taken to conference and

activity rooms outside of their classrooms for 30-minute sessions, 2 days a week to receive instruction on social skills. The participant's social, behavioral, and academic performance was being observed as a result of the instruction and was measured by direct observations. These direct observations measured: total disruptive behaviors in the classroom, academic engaged time in the classroom, and negative social interactions on the playground. Results showed a decrease in disruptive classroom behavior, increases in academic engaged time and a decrease in negative social interactions on the playground (Lane, et al., 2003). A limitation of this study is that the students did not receive any interventions in their regular classrooms.

Research Questions

The more exposure to interactive play and positive peer reporting a child has in preschool, the higher their levels of academic achievement will be in kindergarten. Increasing a child's positive social interactions through PPR, positive interactive peer play, and social skills interventions will also increase the amount of academic engaged time (Lane, et al., 2003). Therefore it is hypothesized that if a child who exhibits higher than average problem behaviors and is at risk for antisocial behaviors is exposed to social skills instruction in a classroom setting and a PPR(tootling) program in preschool, then that child will have more academic success. Also, what are the effects of a tootling program on the prosocial behaviors on an emotionally immature student in a preschool classroom?

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Strategies to improve behavior and academic performance of students in juvenile corrections:

A review of single subject designs applicable in the juvenile detention system.

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Juvenile delinquents incarcerated in detention centers have more in common than the cells and dormitories they sleep in, the jump suits they are required to wear, the single phone call per week or the military hair cuts they hold. Incarcerated juveniles are more likely to experience failure in school and throughout their lives' endeavors (Scott, et al. 2002). Leone, Meisel and Drakeford (2002) noted that students within the correctional system have marginal literacy skills and have experienced grade retention and academic failure in school. They also noted that, though not a cause of delinquency per se, poor literacy has been linked to an increased possibility of delinquent behavior and run-ins with the juvenile justice system. Sadly, the number of students in juvenile facilities is on the rise. According to McCurdy, Mannella and Eldridge (2003), during a five-year span from 1991 through 1995, there was an increase of over 9% in the number of juveniles placed in facilities. Moreover, 30% to 70% of incarcerated juveniles have been identified as either having a learning disability or behavior/emotional disabilities (Leone, Meisel and Drakeford, 2002). What's more, McCurdy, Mannella and Eldridge (2003), and Leone, Meisel, & Drakeford (2002), and Scott, et al. (2002) all noted that students within juvenile corrections come from poor, single parent, low income families where they may be exposed to abuse, drugs and relatives involved with the justice system. It seems evident that incarcerated juveniles have a monumental hurdle to clear in order to get their lives on the positive track. Though their concerns are many, the key factors to be addressed in this review are behavior and academic performance. Research shows that a quality education is among the best methods of preventing crimes and reducing crime rates in juveniles (Scott, et al. 2002).

The purpose of this review is to identify and critique single subject research designs shown to improve academic achievement and/or problem behavior within a juvenile detention facility. Unfortunately, examples of single subject research to improve academic performance of students conducted within the juvenile justice system are scarce, to say the least. There are, however, studies conducted in alternate and regular school settings that may be replicated, or at least attempted, within a juvenile detention center. Of the studies that surfaced, two were not single subject designs in that they dealt with individual students but, they dealt with a single school and the implementation of a school wide positive behavior strategy (insert author, date for the studies). Several researchers verified the use of teacher mediated interventions (insert author, dates of the studies here) and one study dealt with students monitoring students (insert author, date). The critique will include summaries of the studies, key findings, and implications for implementation in juvenile detention setting.

Critiques of the Studies

       Positive Behavior Support (PBS) is a school wide strategy reviewed by Scott, et al. (2002), and McCurdy, Mannella and Eldridge (2003). Scott et al. (2002) describe a general overview and in depth explanation of PBS explaining how it can be implemented in the juvenile correction system. McCurdy et al. (2003) article describe a case study where PBS was implemented in an urban elementary school.

       PBS is a school wide system of behavior support where by all students are affected at different levels of intervention. Scott, et all. (2002) describe these levels as primary basic set of rules and intervention strategies received by all students in the school. At this level, students are taught appropriate skills and behaviors to enable them to interact successfully within school and their communities in an effort to prevent future problem behavior. The secondary stage is geared towards more individualized strategies for students currently exhibiting problem behavior. Secondary intervention would include the implementation of data collection, collaboration amongst school personnel and the implementation of a behavior intervention plan. The tertiary stage is geared towards students who continue to show serious problem behaviors despite primary and secondary support. This stage involves the possibility of specialized placement and further collaboration between the school, parents and alternate placement facilities.

       The PBS model implemented by McCurdy, et al. (2003), dubbed The Key-to-Success Project, showed some promising results. The study took place over two years in an inner city elementary school where a school wide token economy was implemented. Contingent on demonstrating appropriate behaviors, students received "keys" in the form of tickets that could be exchanged for rewards. Students consistently performing well were allowed to join the "Gold Key Club," and therefore were privy to more substantial rewards such as trips, movies, and assembly programs. The project also involved the implementation of behavior expectations during all student transitions within school as well as placement of personnel throughout recess and out of class areas to monitor behavior. Data was collected throughout the two-year implementation of the program as well as the year prior to implementation. Treatment integrity was maintained through continuous monitoring (data collection) and collaboration and produced a mean score of 86% compliance.

       The results of this study were impressive. There was an overall reduction in disciplinary referrals of 46% [moving from a mean of x% during baseline to y% during intervention) and a decrease of 55% in referrals for fighting (moving from a mean of z% during baseline to a mean of t% during intervention. Moreover, the teachers and school staff liked the system, an important factor for maintaining the system.

       PBS would seem a great system to implement in juvenile detention centers. However, there are some limitations in the studies and possibly within programs as well. Most notable is the lack of research of PBS being used within detention centers. There is also the issue of collaboration and altering the prevailing culture within detention centers that is currently geared around punishment to one of positive behavior supports and interventions. Moreover, the primary, preventative phase of the system would have to be altered because most of the students in an adjudicated program are well past the prevention of negative behaviors. The system would have to be one of ceasing current problem behaviors and preventing any future occurrences. There is also

the issue of the relevance of behavior within the system. As noted by Scott, et al. (2002), functional assessments of behavior (FABs) must become geared towards behaviors within the system and not on behaviors that got the student incarcerated due to the change in placement and the presence of a structured system. Implementing a PBS system might show improvement in both behavior and academic performance of individual students within a detention center system. If the research shows that poor academics lead to poor behavior, then improving these students' social and academic skills is a requirement for them to have any success in the future.

Another possible intervention that may apply to the correctional system is the use of consultation amongst school and program personnel to develop and implement interventions. Wilkinson (2003) provided an example of how consultation between school personnel can improve problem behavior of students. In this study, an AB design was implemented between the subject's teacher and the researcher (Wilkinson) so as to monitor and implement strategies to improve the student's behavior in class. The student was a 7-year old first grader named Ann who demonstrated frequent off task behavior, physical and verbal altercations with peers, mood swings and refusal to follow rules. Required interventions were developed through Q&A sessions between teacher and researcher. Baseline levels of performance were measured for five days. Then the intervention (contingency contract/behavioral contract) was implemented while student performance was measured over 8 days. Subsequently, follow up data was taken after four weeks. Partial interval method was used to measure occurrence/nonoccurrence of target behaviors; interobserver reliability was checked on 25% of the observations yielding 85% agreement. The teacher completed a 7 choice Likert scale on 12 items to determine consumer satisfaction and consultation effectiveness. Data showed a decrease in problem behavior from 46% during baseline to 12.4% during intervention. Data also showed maintenance during the follow up stage. Treatment integrity was obtained through constant visits with the teacher.

Wilkinson's study has several limitations when attempting to generalize it to a detention center. The age of the subject and the simplistic rewards do not translate over to the adjudicated population. Because there was a downward trend in the baseline phase and no return to baseline phase, there may well have been other influences that contributed to the student's change in behavior. However, this study showed that consultation in implementing a behavior intervention proved to work well. This particular aspect could be carried over and replicated in a juvenile detention center. As with the PBS studies, communication and teamwork between the educators and correctional staff could provide for more effective interventions for current and future behavior (Scott, et al., 2002).

Fabiano and Pelham (2003) used a multiple baseline across settings (afternoon and then morning) to determine the effectiveness of classroom interventions on an 11-year old boy (John) with ADHD. John was demonstrating poor academic progress and behavior including interruption of classes, getting out of seat, talking back, and teasing of peers and noncompliance. Interval measures were taken in 15-second intervals for disruptive behaviors and consequent 6-second intervals were measured for on-task behavior. The student was given time to play with a personal video game system when he had no more than two occurrences of problem behavior where the teacher needed to intervene. Baseline and intervention were started for the afternoon and were implemented for the morning session, thus providing a multiple baseline design. Teachers were required to provide immediate feedback when John misbehaved.

Results of the study showed that on-task behavior increased from 62% to 84% in the afternoon and from 66% to 90% in the morning. Disruptive behavior decreased from 30% to 10% in the afternoon and 21% to 7% in the morning. Observers took daily data on both John and a randomly selected student. The observations of the other students provided a mean representation of acceptable behaviors to which John's behavior was compared. When compared, John's improper behavior was below the mean during pm intervention and on par with the mean for am intervention. John's on task behavior was above the mean for the morning and about par for the afternoon sessions. Interventions and behavior plans were developed in consultation between John's general education teacher, special education teacher, and a consultant. Interobserver reliability was measured on 15% of the observations and measured 89% for the off task behavior and 86% for the on task behavior. Overall, Fabiano & Pelham (2003) produced impressive demonstration of the power of contingency contracting for changing on task behaviors and disruptive behaviors.

The relevance of this study for students in detention lies in the target behaviors and methods of intervention. Poor behavior and academics, issues critical to incarcerated juveniles, were the target behaviors improved upon with this study (McCurdy, Mannella, & Eldridge 2003; Leone, Meisel and Drakeford 2002: Scott, et al. 2002). Moreover, consultation and collaboration, both issues addressed by McCurdy, Mannella and Eldridge (2003), Wilkinson (2003); Scott, et al. (2002), were also implemented in developing appropriate interventions and modifying current program trends. Though the study had limitations in that there was no return to baseline, the data collection and intervention during second (am) phase was brief at only four observations and the lack of a follow-up phase provide reason to question functional relations between baseline and intervention, and the results are applicable to a juvenile detention center. The one concern that might be raised is the reason why the student is performing the desired behavior. Will John continue to perform well if he is no longer given his game system and free time?

Frank, et al. (2000) studied the use of student peer reporting to improve social behaviors of students in residential placements. They indicate that delinquents in residential settings tend to reinforce negative behavior. The purpose of their study was to reward students for reporting socially appropriate behaviors carried out by their peers. The study involved four students (two females, ages 16 and 15, and two males, both age 10) living in separate residential programs and noted by their caseworkers as being the least accepted by their peers. During intervention, non-target students were given the task of monitoring and recording the behavior of the target students. The groups would then have a meeting and any behaviors noted during the day were discussed and praised. After the meetings, the groups were given free time in which to socialize. At this time, data on positive and negative interactions was collected in 15-s intervals. Likert scales were completed by all students at the beginning and end of the project to rate how they liked to work and play with each peer. Mean interobserver agreement across all four students was 89% for positive/negative and non-behavior; treatment integrity was checked by the researcher providing for 100% procedural integrity.

Results of the study showed an overall increase in social activity across all peers. Data also showed a moderate decrease in negative behavior for one student, a slight increase for another, and no change for two of the peers. There was an increase in social acceptance for only two of the peers. One peer who showed no change in interactive behavior and no increase in acceptance, demonstrated an increase in general standing within her home. Frank et al. (2000)

provided an alternative to teacher mediated treatment designs like the previous examples and emphasizes the importance of improving positive peer relations and social acceptance in a setting where negative behavior is usually the norm is crucial. The implications for implementing a peer mediated behavior intervention in a juvenile facility seem promising. Though limited in the short time for observation and isolated settings, there is some promise in that socially appropriate behavior was improved amongst a group not normally known for their social prowess.

Summary and Conclusions

Pierce, Reed and Epstein (2004) noted that about 90% of all teachers mediated interventions applied in practice have had positive effects on academic achievement of students with behavior disorders. The three studies described previously tend to agree with this measure in that they all produced positive effects on behavior and academics.

Research Question

The purpose for this study is to implement a plan to improve behavior and academic performance of students within a juvenile detention center. In reviewing the literature, one thing has become clear, collaboration and consultation between agencies is key to implementing any plan of action. *Can interventions designed for regular school settings be effectively implemented in a residential juvenile detention facility?* Therefore, the research question is

What effect will a positive behavior support model within one detention facility currently holding 102 adjudicated juveniles between the ages of 14 and 19 have on the academic performance of the juveniles?

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The Effects of a Structured Reading Program on Reading Fluency and Reading
Comprehension in Emerging Readers with Emotional and Behavioral Disorders

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Reading is not only a necessary skill for success in school, but can also be seen as a
survival tool in life outside of school. Many emerging readers find difficulty in the acquisition of the
new skills involved in reading, such as phonemic awareness, phonics, fluency, and
comprehension. Students with emotional and behavioral disorders experience similar frustrations
in addition to their pre-existing difficulties with social and emotional adjustment. "Without
intervention, these students are far more likely to fail their way out of school and continue to fail
throughout their lives" (Scott & Shearer-Lingo, 2002, p. 167). It is crucial to intervene with this
population of students early in their schooling to provide a foundation for future academic success.

Reading fluency and comprehension are strongly linked, and it has been found "that slow
or poor readers are not able to decode words fluently, and therefore are unable to process the
meaning of text" (Scott & Shearer-Lingo, 2002, p. 168). A structured reading program that focuses
on fluency and the comprehension of text will provide students with emotional and behavioral
disorders with the necessary components to become successful readers.

The following articles report some of the effects of reading interventions in relation to
students with emotional and behavioral disorders. The articles were located using the Florida
International University library's databases. The databases that produced the most relevant results
were PsycINFO and Education Full Text via Wilson Web. Articles were located by using applicable
keywords such as 'reading', 'reading fluency', and 'reading comprehension'. The results were then
filtered using AND 'behavior disorders', 'emotional disorders', or 'severely emotionally disturbed'.
Not much research has been conducted specifically with this population of students, so including
the population of students narrowed down the search results tremendously.

Critique of the Studies

Scott and Shearer-Lingo (2002) investigated the effects of direct reading fluency
instruction in relation to the academic and behavioral success of middle school students with
emotional and behavioral disorders. Specifically, they examined the effects of a repeated reading
instructional strategy on the reading fluency and on-task behavior of three middle school students
in a self-contained classroom. The students were identified as reading at a minimum of 3 years
below grade level who exhibited high rates of disruptive behavior leading to multiple occurrences of
exclusionary discipline practices, including isolation, time outs, and suspensions.

Scott and Shearer-Lingo (2002) implemented two sequential reading programs that
adhered "to research-based instructional principles for teaching reading" (p. 168). Both programs
included a self-monitoring component and teacher directed instruction. A multiple baseline design
was used to measure the impact of the intervention on reading fluency and on-task behavior of the
participants for 50 consecutive school days. There was a steady baseline among each of the
subjects for oral reading fluency and on-task behavior, which confirmed low rates of reading
fluency and on-task behavior. During 25% of the sessions, reliability of the measurement was

monitored by comparing the measures of two independent observers. An Inter-Observer Agreement (IOA) of 99% was achieved for the oral reading fluency measure and an IOA of 87% was achieved for the on-task measures, demonstrating the measures used can be considered reliable.

Each participant received intervention consistent with their reading achievement level. The participants differed in the amount of progress made, but all showed an increasing trend of achievement and on-task behavior. Throughout the study, it is evident that the each student benefited from the direct intervention, with academics as well as behavior. From the study, the authors concluded that "when lessons are constructed and taught in a manner that facilitates immediate and consistent success, students have an incentive to continue those successful behaviors" (Scott & Shearer-Lingo, 2002, p.172). Motivation is an important variable when working with students with emotional and behavioral disorders. Providing opportunities for success increases motivation and motivation increases participation and effort. This is a reciprocal process in which students can thrive if given the opportunity.

Strong, Wehby, Falk, and Lane (2004) conducted a study that included a structured reading curriculum in addition to repeated reading strategies. The purpose of this study was to assess the impact of the interventions on reading fluency and reading comprehension. The authors implemented a multiple baseline design in which the students received Corrective Reading interventions during phase I and Corrective Reading interventions in conjunction with repeated reading interventions during phase II. Corrective Reading is a research based program "specifically designed for students who have deficits in reading recognition and comprehension" (Strong, et al., 2004). "Repeated reading is the rereading of a short, meaningful passage several times until a satisfactory level of fluency is reached" (Strong et al., 2004).

Six male students participated in the study: 2 seventh graders and 4 eight graders. All participants were previously identified as having emotional and behavioral disorders and were previously placed in a self-contained classroom. Each participant was of low average intelligence and recognized as a struggling reader. The study took place during 96 consecutive school days within the self-contained classroom. The researchers used standardized assessments to measure the participants' achievement in the areas of reading fluency and comprehension.

The baseline phase showed a steady trend of low performance for each student, indicating that intervention was warranted. The corrective reading phase showed a moderately increasing trend only with the systematic introduction of the intervention over the multiple baseline design. The corrective reading phase combined with the repeated reading phase showed the most dramatic results with an increasing trend for each student concurrent with the introduction of the intervention. The interventions used by the authors seemed to have positive effects on the reading success of the participants; however the authors noted some difficulties in implementing the interventions. They were met with challenges of absences, suspensions, and behavior issues that interfered with the consistency of the intervention. Although the authors experienced some difficulties with the interventions, the results achieved through the study were well worth the time and the effort. When working with this population of students, it should be expected that many obstacles will be encountered. It is important to be able to continue to implement the study in the most controlled manner possible in order to produce the 'true effects' of the study. Just because a study may be difficult to implement, it does not mean it should be abandoned.

Direct Instruction (DI), an explicit rule-based instructional approach, is a popular method of teaching reading to emerging readers. Miao, Darch, and Rabren (2002) conducted a multiple baseline study in which DI was combined with precorrection strategies in teaching decoding skills to students with emotional and behavioral disorders. "For this study, the precorrection strategy adapted for use included having the teacher (a) identify the context and the predictable academic problems, (b) specify expected behaviors, (c) systematically modify the context, (d) conduct behavior rehearsals, (e) provide strong reinforcement for expected behaviors, (f) prompt expected behaviors, and (g) monitor the plan" (Miao, et al., 2002, p. 167). The researchers monitored participant progress in the areas of percentage of correct words, the recall of previously taught material, and on-task behavior. Unfortunately, no IOA was mentioned in the study, which limits the reliability of the study.

The participants consisted of 6 first grade students with low average intelligence and who were experiencing difficulties with basic reading skills. The results of this study suggest that precorrection used with Direct Instruction teaching methodology can be an effective and efficient intervention for teaching beginning reading skills to students with emotional and behavioral disorders. However, the focus of this study was mainly on basic reading skills and not on fluency or comprehension. Although the methods proved to be beneficial, it is uncertain as to whether or not the methods will have any effect on fluency or comprehension.

Hale, Skinner, Winn, Oliver, Allin, & Molloy (2005) conducted an investigation on reading comprehension in relation to listening while reading (LWR). The study arose out of dissatisfaction with the more popular strategies, such as repeated reading. The authors argued that "repeated reading procedures can be time consuming…and may increase comprehension levels without increasing comprehension rates" (Hale et al., 2005).

The study included 4 participants at the secondary level with average intelligence who read at the primary level. An alternating treatment design was used where the participants were exposed to two or three conditions per session over a course of 9 sessions. The interventions employed were solely listening to text being read aloud, listening to text being read aloud and following along simultaneously, and silent reading. At the conclusion of each session, students were assessed in the area of comprehension. The "data suggest that neither accommodation procedure consistently caused large increases in comprehension levels" (Hale, et al., 2005). From this study, it is evident that more success has been reached through structured reading programs than listening interventions. The design of the study, the methods and implementation, were a satisfactory example of a single subject design. There was limited success with the interventions chosen for the study, which limits the practicality of the study as a whole. However, not all studies are successful and it is important that they are published to inform the public what strategies may not be effective and to provide implications for future research.

Conclusions

It is known that "early and explicit reading instruction is critical to children's learning and their difficulties become persistent and long lasting if their reading disabilities are not remediated early" (Miao, et al., 2002). Although there is a plethora of research on reading strategies, there is a limited amount of research related to the population of students with emotional and behavioral disorders. From this review, it was found that research has been conducted to remediate reading

difficulties in secondary students, as well as direct instruction approaches to teach basic reading skills. But what happened to the emerging readers and the ones who have some phonetic decoding ability and are now expected to read for understanding?

Research Question

A single subject research study is proposed that combines a direct instruction approach with repeated reading strategies to enhance the reading fluency and comprehension of emerging readers with emotional and behavioral disorders. The question is:

What effect does direct instruction with repeated reading have on the reading fluency and reading comprehension of emerging readers with emotional and behavioral disorders?

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Promoting Speech Acquisition in Children with Autism:
Making Speech a Requirement in the Picture Exchange Communication System

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Recent studies show that one child out of every 166 has autism with a 4 to 1 ratio of males to females (Klab, 2005). The number of children diagnosed with autism has increased immensely in the past twenty years. This increase in prevalence has provoked many researchers to explore the many facets that characterize this pervasive developmental disorder. Still, autism is a puzzle that is far from being solved. Though some key pieces have been placed, many prime details have yet to emerge. This is a controversial topic that merits further research.

Autism is often characterized by a severe failure in socialization, with inappropriate and maladaptive behaviors such as self stimulatory actions, self isolation, stereotypical mannerisms, and disruptive behaviors; deficits in communication; and speech delays (Klab, 2005). There has been an increasing amount of research in the area of communication and speech acquisition since both components are vital in every day functioning (Schwartz, Garfinkle, & Bauer, 1998). Most of the references utilized in this research proposal were found in the Eric database with key words such as PECS, autism, communication, and speech acquisition. Most of the publications were fairly current, dated from the year 2000 to the present and one was form 1998.

Review of the Literature

One method for facilitating communication in individuals with autism which has received a great deal of attention is the usage of an alternative and augmentative communication system (AAC). This system is said to either supplement the individual's current speech repertoire or serve as their primary form of communication (Miranda, 2003). Examples of such systems are sign language, voice output communication aids (VOCAs), and the picture exchange communication system (PECS). Although all these methods have shown to be efficient in promoting communication in individuals with various developmental delays, PECS has shown to be the most compatible with the specific characteristics of individuals with autism (Bondy & Frost, 2001; Bondy, Tincani, & Frost, 2004; Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002; Ganz & Simpson, 2004; Miranda, 2003; Sshwartz, Garfinkle, & Bouer, 1998).

PECS has proven to be successful with the autism population for many reasons. For instance, it incorporates child initiation, requires few complex gross motor movements, can be taught quickly, and promotes functional communication. Plus, one domain that has indirectly shown to increase as the result of PECS implementation is expressive language in the form of speech. Although speech acquisition is a major goal in treating individuals with autism, few studies have explored it as a dependent variable in relation to PECS.

Schwartz et al. (1998) presented two empirical studies that utilized PECS with preschool children exhibiting severe disabilities. The first study evaluated the rate at which PECS was learned. Here the population consisted of 31 young children participating in an inclusion, university-affiliated preschool program whom were already exposed to PECS. The sample consisted of nine females and twenty-two males. All the children were diagnosed with conditions

such as autism, Pervasive Developmental Disorders-Not Otherwise Specified (PDD-NOS), Down syndrome, Angelman's syndrome, or other developmental disabilities. The entire sample experienced severe social, communication, and cognitive deficits. The intervention was conducted in the participant's special education classrooms.

The PECS protocol [the intervention] included several steps. First, there is *basic exchange* where the child picks up a symbol (line drawings) and hands it to the adult. Then there is *distance and persistence*, where the adult has moved away from the PECS symbols and the child needs to persist in exchanging the PECS. Then there is *discrimination*, where the child needs to be able to choose the appropriate symbol that corresponds with his preferred item from a variety of other symbols. Plus, there is *sentence building* where the child constructs a sentence via an "I want" symbol paired with a symbol of a preferred item and exchanges the sentence strip with the communication partner (adult). The final step requires the child to use PECS in requesting items from peers.

The results to this study were promising in that in 14 months time, the children learned a functional method for communicating with adults and peers. Still, one area not addressed was spontaneous speech acquisition as a result of PECS implementation or other forms of communication other than requesting. The second study conducted by Schwartz et al. (1998) addressed these issues.

The participants in the second study included 18 students from experiment one. The study took place in the integrated preschool classrooms of the children and the data were acquired during snack and free-choice time. The data was composed of communication acts made by the children during the specific setting mentioned. The observers coded the data to detect the form of communication used (gestures, vocalizations, manual signs, PECS, and verbalizations) and the particular function it had (request, comments, protests, responses, and no communicative intent). The researchers also noted if the communication act was prompted by an adult and whether the verbalizations (if any) were a result of immediate imitation.

While analyzing the data for spontaneous speech acquisition, the researchers noted that two distinct groups emerged: talkers (those children that used five or more words during the first free-choice activity) and non-talkers (used less than five words). The results indicated a continual increase in vocabulary for the *talkers* and a small change in the vocabulary growth and spontaneous words used by the *non-talkers*. Overall, 44% of the children acquired unprompted, non-echolalic speech. Plus, all the children showed an increased ability to use different communication functions, such as commenting, responding, and protesting following PECS implementation.

This study supported the notion that PECS is effective in promoting functional communication in children with various pathologies. In regards to speech acquisition, they achieved encouraging outcomes due to the 44% of the children that acquired speech. Still, the correlation between the usage of PECS and speech acquisition warrants further investigation.

Rowland and Schweigert (2000) extended the work of Schwartz et al. by showing the effectiveness of tangible symbols with children experiencing multiple disabilities in a 3 year study. According to the authors, tangible symbols may be a good option for those children who

developmentally are not able to attain abstract symbols (PECS). They hoped to illustrate that by learning tangible symbols, some children may acquire the use of more abstract symbols. There were 41 children in the study who experienced diverse conditions such as mental retardation, developmental delay, vision impairment, hearing impairment, seizure disorder, and medical fragility. All participants demonstrated cognitive delays. Receptively, they showed that they did not comprehend speech, written words, or sign language. Some participants demonstrated expressive communication via gestures, where others demonstrated no functional communication. The research was conducted in the children's classroom.

What was most interesting about this study was how the researchers individualized the intervention for the particular needs of each participant. If a child did not communicate independently, assistance was individualized and provided via less intrusive to more obvious prompts to avoid prompt dependency. Plus, the criterion was changed as the child mastered the levels of the treatment in order to enhance learning. This child centered treatment resulted in differing outcomes across participants.

The results of this study were encouraging although the participants differed on the levels of the representation acquired. For instance, four of the participants did not acquire tangible symbols; six demonstrated they could understand the symbols if presented in 3-D form and were identical or very similar to the referent. Four of the children worked with 3-D symbols that shared some common features with the referent. Seven children acquired the usage of 2-D photographs, and another eight used 2-D line drawings. Three children acquired the usage of print or sign in order to communicate. Although speech was not a primary goal in this study, it was evident that seven children used speech in order to communicate; four began to use it as their primary method of communication.

This study further supported the efficacy of symbols in promoting communication in children with various handicapping conditions and as a result speech for some children. Still, the results should be interpreted with caution since many aspects of the study were not controlled (e.g., the intervention or the sample). Nevertheless, this study provided insight on how children with various disabilities can advance to a more abstract form of communication such as abstract symbols and speech via the usage of tangible symbols.

The studies mentioned thus far provide substantial support for the usage of symbols (PECS) in the promotion of functional communication and speech in children with various developmental conditions. Still, according to Charlop-Christy et al. (2002), the efficacy of PECS merits more empirical investigation. Furthermore, they stated that although insightful, the study conducted by Schwartz et. al. lacked experimental research and control.

Therefore, Charlop-Christy et al. (2002) conducted a multiple baseline design to evaluate the effects of PECS with three children with autism ages 3, 5, and 12. Via a single subject design, they evaluated the amount of training needed for the mastery of PECS. Primarily, their goal was to assess spontaneous spoken language and imitative speech. They also wanted to explore secondary effects such as social communication and problem behavior. The setting in which the study took place changed with the evolution of the intervention. First, PECS training was conducted in a room with a one way observation mirror. Then it progressed to an empty classroom in the

university, the child's classroom at their school, and finally to their home. The intervention was embedded in free-play and academic sessions.

The PECS protocol was similar to the one reported by Schwartz, et. al. (1998) with minor revisions. It was done via prompting and differential reinforcement and involved six phases: physical exchange, expanding spontaneity, picture discrimination, sentence structure, responding, and commenting. The dependent variables included amount of time for PECS mastery and speech emergence. Secondary measures such as social communication and problem behaviors were also recorded.

The results indicated that the 3 children accomplished PECS mastery in a short time frame. All three children exhibited an increase in speech only when PECS was systematically introduced. Plus, they also communicated with novel persons and in different settings, which proved that the skills acquired were generalized. In evaluating the auxiliary goals, there was an increase in communication skills which seemed to be negatively correlated with problem behaviors.

This research study empirically contributed to the recognition of PECS as an efficient alternative form of communication for children with autism. It included a multiple baseline design which further illustrated the effectiveness of the treatment via base line logic. It also promoted the usage of PECS in various settings to encourage generalization. Another strength of this study was the implementation of a delayed vocal prompt which allowed the child to spontaneously state what he wanted without assistance. Still, speech here was a goal but not a requirement to obtain the preferred item. If speech where made contingent on receiving the preferred item, there might have been an even greater increase in word utterances. The order of the phases in the intervention may not be conducive to promoting maximum spontaneous speech since the child is expected to first spontaneously mand for a preferred object via a sentence strip "I want_" and then respond to the question "what do you want?"

 Ganz and Simpson (2004) extended on the work of Charlop-Christy, et al. (2002). They studied the role of PECS in increasing the words spoken by three young children (1 female and 2 males aged 3, 5, and 7) with autism spectrum disorder (ASD) and developmental delays (DD). They evaluated the intervention in expanding the length and complexity of the phrases and decreasing non word vocalizations used by these children. The study was implemented in the children's classrooms, situated in a low socioeconomic urban school district.

This research employed a changing criterion single-subject design. The independent variable was PECS training in the form of trainer modeling of verbalizations and standard guidelines of implementation. The PECS protocol in this study was similar to the one discussed in previous research. It consisted of four phases: *basic picture exchange*, *increasing distance*, *picture discrimination*, and *sentences*. There were three dependent variables: proficiency in using PECS to communicate, number of intelligible words spoken, and the presence of non word vocalizations.

 The results indicated that all three participants were successful in mastering the PECS protocol and in a shorter amount of time in comparison to previous studies. Although they all began the intervention with a maximum of one-word utterances in their repertoire, the children graduated from the intervention using three to four words per phrase. The target behavior (an increase in

word production) was achieved and surpassed with the implementation of the PECS system. The changing criterion design exhibited in this study showed functionality in that the target behavior was achieved by systematically increasing the criterion for the each child to obtain a preferred item. One interesting finding was the dramatic increase in words per trial observed during phase four where delayed verbal modeling was employed. Also, no clear relationship was evident in relation to PECS and non-word vocalizations.

This study provided additional empirical support for the usage of PECS in promoting an alternative form of functional communication for children with autism and developmental delays. One strength here was the usage of both male and female participants and the powerful single-subject design employed. Still, one vital component that was missing was a baseline. Also, in this study, vocalizations were promoted but not required. This fact may contribute to the prevention of the expected decrease in non-word vocalizations.

Conclusions

Based on the review of the literature regarding the effects of PECS in promoting functional communication in children with varying disabilities including autism, it is evident that this augmentative and alternative communication system is efficient in increasing not only receptive communication, but also speech. Nevertheless, speech was consistently manipulated as a goal rather than a requirement. The same promising results have been observed when PECS was implemented at Children Psychology Associates.

It is hypothesized that PECS can promote greater gains in speech acquisition by altering the protocol to make speech a requirement. The usage of delayed verbal prompts may also be beneficial here since spontaneous speech, in natural settings, is said to be increased by a time delay (Charlop & Traswech, 1991). Furthermore, since early intervention is key in children with autism, especially for the acquisition of speech, efforts should be aimed at toddlers and young children with autism. Also, a sample consisting of both males and females along with "talkers" and "non-talkers" is needed.

Research Questions

1. Given a sample of toddlers and young children with autism (including males and females, talkers and nontalkers), what are the effects of making speech a requirement to gain preferred stimuli?

2. Given a sample of toddlers and young children with autism (including males and females, talkers and nontalkers), what are the effects of delayed verbal prompts on spontaneous speech within natural settings?

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SOCIAL BEHAVIORS

The Use of Social Story with Individuals with Autism Spectrum Disorder
Literature Review

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Many persons with autism experience difficulty in social cognition, the ability to think in ways necessary for appropriate social interaction. For example, some people with autism have difficulty in assuming the perspective of another person. This can be addressed by a technique which is used to help individuals with autism 'read' and understand social situations. This technique, called Social Stories, presents appropriate social behaviors in the form of a story. Is a strategy developed by special educators for modifying problematic behaviors of children with autism, It seeks to include answers to questions that autistic persons may need to know to interact appropriately with others (for example, answers to who, what, when, where, and why in social situations). Social stories are useful for helping individuals with autism learn appropriate ways to interact in social situations. They can be individualized to incorporate the specific needs of the person for whom the story is written. They can teach routines, how to do an activity, how to ask for help, and how to respond appropriately to feelings like anger and frustration. While studies are currently assessing the effectiveness of social stories, they appear to be a promising method for improving the social behaviors of individuals with autism. The use of single subject design is often characteristic of the experimental analysis of behavior. The single subject design typically focuses on an examination of behavior change in one individual. A literature research will provide in depth information on the use of social stories with individuals with autism spectrum disorder using the single subject methodology.

Review of Related Literature

Adams, Gouvousis, Van Lue, and Waldron (2004) investigated the effectiveness and carryover effects of social story intervention. A single subject design was used to determine the efficacy of social storied in decreasing socially inappropriate and undesirable behaviors for Peter, a child with ASD (Autism Spectrum Disorder). The participant was a 7-year-old Caucasian male enrolled in first grade receiving speech language support services. Peter's parents reported that he had some difficulty with math and reading and fine and gross motor delays. When he found himself struggling to complete certain task, he expressed two or more recognizable emotions (e.g., frustration, anxiety, stress) either physically (falling from chair, hitting) or verbally (I can't do this). He rarely played with peer in the same activities; however he preferred his peer to participate in activities of his choosing. Peter exhibited repetitive behaviors.

An ABAB design was used to determine if social stories were effective in decreasing inappropriate or undesirable behaviors. Four behaviors were measured crying, falling, hitting and screaming. Functional analyses of Peter's problems behaviors were serving one function, to escape doing his homework. The independent variable (social story) addressed completion of homework, the experiment was divided into four phases with each phase consisting of 12 homework sessions in the home setting. During Phase one, behavior without the intervention was recorded. Researchers observed the most frequent and most distracting frustration behavior during homework time. The second phase was the intervention phase during which the social story was used to decrease the behaviors noted during the baseline condition [and increase homework

completion?]. A return to baseline condition occurred during phase three, and the intervention was reintroduced during phase four.

Results indicated that there was a 48% decrease of crying episodes from baseline, screaming decreased 61%, falling decreased 74%, and hitting decreased 60%. The behaviors were not eradicated but were significantly reduced. Peter's teacher stated that his crying, bangs on his desk, and falling on the floor decreased as the use of social stories was introduced and implemented in the home environment. This suggests the generalizability of the intervention.

Kuoch and Miranda (2003) studied the use of social story to remediate some of the problems with social stories, conforming to the guideline for implementation. Three young boys with autism spectrum disorder were selected; Andrew was 3 years 10 months (Italian-Canadian); Henry was 5 years 9 months old (Caucasian); and Neil was 6 years 4 months (Chinese-Canadian). All children were diagnosed with pervasive developmental disorder not otherwise specified. The settings were applied naturalistic settings. Andrews's intervention took place at his home and was implemented by his mother. Henry intervention occurred during both lunch time and snack time in his summer preschool program implemented by two female staff. For Neil, the study was conducted in a summer school program by three early childhood interventionist.

The dependent measure for each child consisted of specific problem behaviors that occurred in the intervention context. For Andrew these included aggression, yelling and crying when asked to share toys or other material with his brother. For Henry the behaviors of concern included hands in pants, making sounds, and throwing up. Hands in his pants occurred when Henry put one or both hands inside pants or his genital area outside his pants. Neil's target behavior included cheating, moving game pieces, touching, and making negative comments while playing games with peers.

For both Andrew and Henry, ABA designs were used comparing baseline/no social story condition and social story with a reversal to baseline. For Neil, an ACBA was employed to compare baseline and two conditions: A social story condition, a book + reminding condition and return to baseline. The intention was to assess treatment reversal during the final phase. Prior to the intervention, two factors, recognition of basic facial expressions and interest in books were assessed. Identification of picture of basic facial expressions was considered to be necessary because social stories often include simple perspective sentence that refer to how other people feel. Interest in books was assessed via a simple check list that was completed by the parent or caregiver.

During baseline, if a target behavior occurred, the interventionist provided relevant corrective feedback (e.g., "No cheating." Or "Don't hit your brother."). No other intervention was included during this phase. All three children participated during the social story phase. Individual social story books were written and produced by the experimenter to reflect each participant's target behavior, interest and abilities. The social stories were read directly to each participant prior to the situation in which the target behavior typically occurred. Neil was the only one exposed to the Book+ Reminder phase. Immediately prior to the activity in which the target behavior occurred, the interventionist read the book to Neil. When the story was completed, the interventionist reminded Neil of appropriate behaviors in the target situation (e.g., "Remember to play nicely with

other kids."). The interventionist responded to any occurrences of target behavior in the same manner as of during the baseline condition (providing corrective feedback).

Results of the study indicated that all three participants immediately reduced their rate of problem behaviors when social story was implemented, and that the results were generalized because the behaviors did not return to baseline levels when social stories were discontinued. The findings are inconsistent with the suggestion that social stories will only work with children with higher intellectual functioning.

Pasiali (2004) investigated the effect of prescriptive therapeutic songs on promoting social skills acquisition by children who have autism. Participants were thee children diagnoses with autism. Diagnosis ranged from high functioning to mildly impaired. Only children who had no hearing loss and who exhibited an obvious attention and positive response to music were included in the study.. Johnny was a 7-year-old male. The behavior targeted was Johnny's aberrant vocalization during dinner time. Peter was a 9-year-old with a diagnosis of Autism whose target behavior was increasing appropriate use of VCR equipment. Helen was an 8-year-old female diagnosis with autism whose target behavior was to decrease or prevent rummaging in the kitchen. The researcher created an individualized song for each participant, the purpose of each was to decrease an undesirable behavior identified by the parents. The researcher developed the lyrics of each song by following the guideline for writing the text of social stories. The adapted lyrics were then set to the tune of a favorite song of the child. The song intervention was implemented during the treatment phase of the ABAB reversal design. The results for each participant indicated that the implementation of the prescriptive song treatment protocol was successful in reducing the target behavior of each participant. Target behaviors did not return to baseline levels during the withdrawal of the prescriptive song.

Ivey, Heflin, and Alberto (2004) investigated the extent to which participation in novel situations within familiar routines increased with the use of social stories. Participants I the study were three boys with pervasive developmental disorder-not otherwise specified (PDD-NOS). Ron, was 7 years 5 months; Adam was 5 years, 1 month; and Hal, was 5 years, 8 moths. According to the parents, all three children experienced difficulty with changes in routine situations. The researchers used a reversal design (ABAB) to analyze participant's participation in the novel event without social story (baseline) and with social story (intervention) Activities were selected because they represented skills that children encounter as part of home, school and community life. Four types of novel events were targeted: Setting changed, novel toys presented by an unfamiliar person, purchases, and novel activities occurring within the sessions. The social stories were introduced in the home. Parents read the social story every day for a week and prior to the weekly visit to the hospital. The speech therapist introduced the children to the novel events in different settings in the hospital. All three boys evidenced an increase in targeted participation with the use of social stories.

Conclusion

Overall, this brief review of the effects of social stories indicates that a significant decrease of maladaptive behaviors occurs for children with autistic spectrum disorder. In some cases, there was an indication of the acquisition of new target behaviors that were not in existence in the child's repertoire. All the participants were children with autism and the severity of the diagnoses varied

from study to study and from target behaviors to target behaviors. The target behaviors ranged from cheating when playing board games with peers, to loud vocalization during dinner time, and responses to a novel situation. All of the investigations yielded positive results. In most of the studies, the target behavior did not return to baseline levels when the intervention was withdrawn showing a tendency for generalization over time. Moreover, the social stories were individualized for each participant's unique setting and target behaviors, indicating the versatility of the intervention to address individual unique needs.

Research Question

How effective are social stories in children with autism at the middle school level?

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<center>Video Self-Modeling for Children with Oppositional Defiant Disorder
Literature Review</center>

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Children classified as oppositional defiant disorder display a broad range of "acting out" behaviors, ranging from minor disruptions to outright destruction of property. There is strong evidence that early oppositional behaviors (noncompliance, arguing) are precursors to more serious antisocial behavior. The fundamental characteristics of ODD are repetitive patterns of the child's defiance, disobedience, and hostility towards adults and authority figures. In addition, the behaviors lead to impairment in academic and social functioning (Mash & Barkley, 1998).

While the defining characteristics of ODD are negative behaviors toward authority figures it is also known that peer relationships are weak for these children. Differences between children with ODD and typically developing children can be observed from an early age and carry on throughout development. They are often known for their bullying, threatening and their lack of social skills.

Social Problems

In the school environment, there is a multitude of psychological issues that inhibit the individual's education and demand to be addressed such as the developmental disorders including mental retardation, autistic disorders and learning disabilities. Intervention is required to provide academic services to these children including social skills. Other groups of children, such as those with conduct problems, also require critical intervention in order to receive academic guidance. Such students also need specific training in social skills for interacting with authority figures and those around them.

Traditionally, treatment of problems in social relationships has not been the highest priority in American psychology (Mash & Barkley, 1998). However, there is increasing evidence that social relationship skills are linked to mental health and educational success. As cited in Mash and Barkley (1998), measures of social interaction, specifically with peers, were correlated to psychological maladjustment in adulthood. Children who had difficulty relating to their same age peers were later at risk for bad conduct from the military and for early adulthood psychoses. Similar findings have been replicated in various other studies. As cited in Mash and Barkley (1998), specifically, measures have included physical and verbal aggression, truancy and school dropout, juvenile and adult criminality, sexual promiscuity, schizophrenia, suicide, and illicit drug use and alcoholism.

Furthermore, Mash and Barkley (1998) describe the prevalence of children with peer related issues is estimated at 12%. This figure includes those diagnosed with disorders as well as those who are not and is retrieved through peer surveys. The childhood disorders that are commonly related to deficient peer relationships include Attention Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD) (APA, 1994). It is evident that these students, and possibly society could clearly benefit from intervention focused on

improving their understanding of social interactions. Since the evidence points towards a variety of repercussions of poor peer relationships including poor academic performance, schools are the practical medium for providing effective intervention for these students. The importance of reaching all of those students that could benefit from improved social relating is not undermined in this study. However, in order to facilitate a productive study design, children with ODD will be the focus of this study.

The prevalence of ODD is found to be 6-10% in the general population and is more common in younger children. A closely related diagnosis of conduct disorder is more typical for older children and adolescence. The causes are considered unknown at this point. However it is hypothesized that genetic and environmental factors are probably combined. Children with oppositional defiant disorder are more likely to have family history of disruptive behavior disorders, substance-use disorders, or mood disorders (http://www.psychnet-uk.com/dsm_iv/oppositional_defient_disorder.htm).

Treatment of ODD may include: parent training programs to help manage the child's behavior, individual psychotherapy to develop more effective anger management, family psychotherapy to improve communication, cognitive-behavioral therapy to assist problem solving and decrease negativity, and social skills training to increase flexibility and improve frustration tolerance with peers.

Video Self Modeling (VSM)

The literature review will focus of the area of improving relationships with peers through the use of video self-modeling. VSM has been replicated in various settings as an effective intervention with the strength to generalize and is therefore considered a good intervention for the purposes of this study. A search was conducted using two databases for the purpose of establishing a background of information. The first database was PsychInfo via Cambridge Scientific Abstracts. The key words entered in the advance search tool were single-subject, video, and self-modeling. This revealed journal articles dating from March 2000 through March 2005. The second search used Educational full text via Wilson Web and the same key words with the exception of using the conjunction 'or' between video and self-modeling. This search revealed 1708 records dating from March 1985 through Winter 2005. These records were then searched through to find those most pertaining to the research topic.

Video-Self-Modeling Defined Generally, self-modeling is defined by the individual viewing images of themselves exhibiting adaptive behavior of a particular type (Hitchcock, 2003). Specifically, video self-modeling (VSM) is operationally defined as a procedure in which people are exposed to videotapes displaying only adaptive behavior (Dorwick, 1999). The video is made by filming footage of an individual performing the desired behavior and editing any possible behavior that doesn't fit the 'desirable' criteria. The end result is a video of superior level of performance. The videos are generally two to three minutes in duration and typically shown to the individual daily or several times a week (Buggey, 2002).

As cited by Hitchcock, et al. (2003), VSM has been shown to be an effective intervention across various settings, behaviors, and ages. Some of the many areas that effects have been seen in include depression, stuttering, attention disorders, behavior disorders, and aggressive disorders. In reviews of studies on VSM, significant gains were reported across all target behaviors

during intervention and follow-up phases (Hitchcock, et al., 2003). It appears that this form of intervention has much to offer the psychological and educational communities.

The value of this intervention comes from it's effectiveness across settings and several other variables. This method is not intrusive since the intervention can take place literally in two to three minutes per day before school and does not interfere with the teachers lessons. In addition, it can be administered on an individual basis and does not require much equipment. Lastly, it is theorized that part of its basis for working is that the intervention helps students to increase their self–concept.

History & Theory The psychological theories behind VSM started with Bandura's social learning theory from 1969. His view on modeling focused on how the process of learning was greatly enhanced for individuals by directly observing the anticipated learned behavior. He believed that self-modeling 'provides clear information on how best to perform skills" and "strengthens beliefs in one's capability" (Bandura, 1974). Studies have shown that the more ideal model is closest to the participant's characteristics (Bandura, 1969). Models with dissimilar characteristics such as unbelievably ideal mastery of the target behavior or visible anxiety are not viewed as effective (Hosford & Mills, 1983).

Contemporary technology makes it possible for self to be the model (Hitchcock, et al., 2003). As cited by Hitchcock, et al. (2003), the term self-modeling was first introduced by researchers Creer and Miklich (1970) when doing a study on social skills with a hospitalized child. The results indicated that in vivo modeling did not have an effect on the boy as did video modeling. A decade later, Hosford (1980) created the term "self-as-model" researching behavioral counseling with adults. He focused on the similarity between the model and the research participant, the self, being the ultimate in similarity.

Critiques of Research on Improving Communication Skills

Numerous studies have been done in the wide realm of communication using self-modeling or video self-modeling as the primary or partial intervention. One such study focused on preschool aged children diagnosed with autism. The focus of the intervention was to train children to increase social-communicative functioning. Participants were known to have a variety of language capabilities, as noted on their IEPs, however their use of request was minimal or non-existent. The dependent variable in this study was therefore 'spontaneous' requesting, defined by independently asking for an object, action, or for assistance. The intervention video was an edited version of the participant being prompted to make requests and showed only unprompted and spontaneous requesting behavior. The children were shown their five-minute 'movies' once a day for five days. The results indicated that the intervention showed marked increased spontaneous requesting for each participant. One interesting observation of the participants was that the youngest participant who was 3.5 years old responded with the least amount of increased SRs. It was hypothesized that this was due to his young age and disinterest in watching himself on video as compared to the other children (Neisworth & Wert, 2002).

This study demonstrates an apparent behavioral response to the intervention by clearly being able to observe spontaneous vocal request by the participants. The interobserver agreement was addressed in all three phases of the study at 100%. This target behavior is of practical

importance to study because one of the identifying characteristics of students with Autism is communication difficulties and communication is of the utmost importance with all individuals. The design and intervention for the study portrayed a plausible and promising independent variable for the particular target behavior. In addition, this study delivers a generalizable approach to addressing increase of spontaneous requests across individuals. Overall, the study was presented well organized and believable, however generalizablity across settings was not shown.

Another study involving improved communication and video self-modeling was done at Florida International University (Reamer, et al., 1998). The focus of this study was on the interactions parents with their autistic children. Since it is observed that parents of children with developmental delays are less verbal, less interactive and more directive with their children, the researchers wanted to increase communication behavior. In addition, the researchers used an intervention that they believed would promote generalization of behaviors across settings since lack of generalization was seen in previously attempted interventions in this area. The intervention phase of the study involved the parent watching a series of edited vignettes of approximately 30-45 seconds of interaction with their child. Three vignettes showed positive examples of the target behaviors and one displayed extraneous behaviors unnecessary for the parent-child interaction. After viewing the tape, the researcher then discussed with the participant the identifiable parent and child behaviors of the vignette. The results of the implementation of this intervention demonstrated variable increases in parental social prompts. Both parents increased from approximately 0-25% during baseline to 0-53% during intervention and remained near 50% during follow phase for both parent participants. In addition, the children's behavior was observed to improve. The authors of this study felt that this study contributed to the literature in terms of the success of the replication of other studies and believed that the stable follow-up and generalization of the study was a promising statement for video self- modeling intervention.

The approach that the authors took for this study should be considered applied due to previous research findings that parents of children with disabilities tend to be less positively reinforcing with these children versus parents of children that are normally developing. In addition video self-modeling has been shown to be an effective intervention across behaviors, it is very likely to be effective for this particular target behavior. The interobserver agreement of this study was reported at 80%, which seems logical since there is some subjectivity to the target behavior of positive interactions. This study is clearly behavioral in that the observed behaviors were spoken. The presentation of the results demonstrated an effective independent variable. The methods section was difficult to follow and the results section did not display graphs, but a chart that was also difficult to interpret. The believability of the design is strong, and generalizability is shown across settings.

Behaviors to Use for Self-Modeling

Children with ODD have a tendency to rely on force to relate to peers, beginning in early childhood (Fraser, et al., 2004). It is theorized that the source of this behavior pattern comes from the home. By any means, as children age they must develop more tactful and skillful means of relating and accomplishing goals with others. Among children who display more socially accepted behaviors, more problem solving skills are also demonstrated.

When functional patterns of relating to peers are not present for some boys and girls they may experience rejection by their peers. Without the skills to connect with socially adaptive peers, children with ODD have a tendency to become isolated or associating with delinquent students who exhibit similar dysfunction (Fergusson, et al., 2001). These students are observed to be deficit in the alternative skills of interaction which leads to heightened peer rejection, constrained opportunities, and limited environmental contingencies (Fraser, et al., 2004).

Research indicates that developmental deficits in children's cognitive repertoire of social skills are associated with early aggressive behavior (Fraser, et al., 2004). Social competence is defined through the combination of emotional regulation and interpretations of social information. This reciprocal interaction is very likely to allow individual's to maintain cognitions and aggressive actions. Responses to social circumstances follow a sequence of information processing steps that which is the critical point for intervention. Intervention may allow mastery of these processing skills plus the ability to modulate emotional intensity. This mastery is thought to potentiate adaptive ability to navigate social situations (Fraser, et al., 2004).

Researchers who have studied increasing the social problem solving skills of children with aggressive behavior patters have established significant increases in children's social competence as well as academics and self-esteem. In recent prevention projects to promote home-school collaboration, family interventions have been combined with child skills training implemented parent skills training, and child skills training and showed a decrease in behavioral problems in school and at home (Fraser, et al, 2004).

Conclusions

Modeling is shown in the research to be effective for a range of interventions. In particular, children with social problems are thought to greatly benefit from such exposure of well adjusted prototypes. Since it is also verified that the self as model is a powerful form of modeling, it seems intuitive that this population of children will increase adaptive behaviors after repeated exposure to such behaviors.

Research Question

The focus of this study is specifically to determine if an edited video of the child solely displaying adaptive behavior will increase the child's adaptive behavior across settings. While there are a number of studies done on interventions with aggressive behaviors, there doesn't appear to be empirical evidence on the use of video self-modeling for children with ODD. The research question is:

What are the effects of video self-modeling for children with oppositional defiant disorder (ODD)?

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ANALYZING POSITIVE REINFORCEMENT

The Effects of Reinforcement on Academic Performance

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The majority of students who are referred for school psychological services have difficulties with academic skill development as well as academic achievement (Shapiro, 1996). The school psychologist is then asked to provide interventions that are helpful in the reduction of these problems. One of the most promising interventions seems to be the use of rewards in order to enhance both the quantity and the quality of student's work (Weiner, Sheridan, & Jenson, 1998). Instead of focusing on the undesirable behaviors of a child, reinforcement strategies focus on the desirable ones and seek to increase their occurrence. There are several methods that can be employed to deliver reinforcement, such as individual rewards or group contingencies. Even though these methods appear promising, there are a number of educators that are skeptical of this approach, since they are seeing the reinforcement as a form of bribery. Another concern is that students will only work for rewards, and do not see the actual value of the learned material. Lastly, several educators are apprehensive about the use of rewards because they fear that the students will no longer engage in the academic behaviors once the reinforcement is removed (Deci, Koestner, & Ryan, 1999).

However, there is strong evidence that reinforcement is a powerful tool that aids in the improvement of academic performance. This literature review will examine the effects of different reinforcement strategies on different students. It will take a closer look at individual reinforcement as well as group contingencies, and lastly at the reinforcing power of task completion itself.

Literature Review

The databases that were used to find suitable articles between the years of 1998 and 2005 about the use of reinforcement in the schools were ERIC and PsycINFO. Keywords that were used included: reinforcement, group contingencies, academic performance, academic achievement, token economy, parent involvement, and homework performance. All the studies selected for this review were single-subject research designs, i.e., reversal designs (Wallace, Cox, & Skinner, 2003), multiple baseline designs (Callahan, Rademacher, & Hildreth, 1998; Popkin & Skinner, 2003; Brooks, Todd, Tofflemoyer, & Horner, 2003), and alternating treatment designs (McCurdy, Skinner, Grantham, Watson, & Hindman, 2001).

Popkin and Skinner (2003) conducted a study with five male students with severe emotional disturbance (SED) that were enrolled in a segregated school specifically for students with SED. The purpose of the study was to evaluate the effects of an interdependent group contingency on the academic performance of these students. With this method, all students can earn access to rewards contingent upon the group's behavior as a whole. In their study, Popkin and Skinner examined how these group contingencies influenced the academic behaviors of the five subjects. Depending on the daily academic performance of the group, the students could earn rewards that either the whole group or no one in the group would receive.

For this experiment, a modified multiple baseline design was used to determine the effects of an interdependent group contingency on the academic target behaviors of the students that

participated. The target behaviors included academic performance on independent seatwork assignments in spelling, math, and English. During the baseline phase, no new contingencies were implemented for these target behaviors. During the intervention phase, the students could earn rewards depending on the performance of the group in academic behaviors. The criteria that needed to be met were randomly selected. During the first part of the multiple baseline design, the intervention was applied only to the academic behavior in spelling. Only the behavior in spelling was therefore rewarded. In the second phase, the intervention was added to math performance, and finally, in the third phase, the intervention was applied to performance in English, as well. The criterion had to be met in one randomly selected subject area (spelling, math, or English).

Every day, the students were asked to independently complete assignments in these three areas. The teachers calculated the mean of the accuracy in the class (each student's percent correct on each assignment divided by the total number of students who attended school that day).

Both the academic goal and the reward were randomly selected by drawing papers from shoeboxes. One shoebox was called the 'Goal Box' and it was filled with cards that specified the target behavior as well as the criterion. If the criterion was met, the teacher would draw another card from a shoebox labeled 'Reward Box.' These cards would tell the students what kind of reward they would receive for the accomplished goal. This meant that the children would not be able to predict which of the three academic tasks would be rewarded at any specific time. However, if the class had not met the criterion, no cards would be drawn from the 'Reward Box,' and none of the students would receive a reward for that day.

The results of this study show an increase in all three subject areas only with the implementation of the intervention; especially in students who had performed poorly during the baseline phase. The increase was especially high in spelling and math performance, whereas the increase in English was not as dramatic (possibly due to ceiling effects, since the performance in English had been high prior to the intervention). The dramatic changes in academic behavior showed that the students that participated in the study had the capability to perform at a higher level, but had previously chosen not to do so. The researchers caution that this method of reinforcement should only be employed if the students have the necessary skills to perform the tasks, since strengthening reinforcement associated with tasks that students are not capable of performing would lead to frustration. Yet, if used correctly, this technique can lead to promising results.

But the use of reinforcement is not limited to the school environment. Reinforcement at home can also lead to positive results if the method is employed correctly. Callahan, Rademacher, and Hildreth (1998) studied the effects of teaching parents of at-risk students a self management intervention program to improve homework performance and academic achievement. Twenty-six students and their parents participated in a multiple baseline across groups design. All students were sixth and seventh graders who were enrolled in one of two programs that were specifically designed for students at risk: Achievement Plus and Program REACH., The students attending these programs had been referred for academic or social – behavioral problems.

Both the parents and the students were informed about the intervention, which was designed to improve homework performance. The performance was defined as both homework completion and homework quality. Over a period of ten weeks, the students were asked to

complete homework assignments in math four days per week. During baseline phase, parents and teachers were asked to deal with the math homework of the student as they would with any other homework assignment. During the intervention phase, the work was placed in a folder, along with a checklist, as well as a Matching Sheet for both the student and the parents. Both students and parents were asked to complete the forms each night, and to return them the following day. Information on these forms included the times that the student started and finished the homework, and whether or not the homework was done at the proper time in the proper location with the proper materials. The parents checked the accuracy of the completed work, and then returned it to the child to correct the mistakes. The parent would then compare both checklists, and award points for matching answers. These points could later be exchanged for a prize chosen from a 'reinforcement menu' that had previously been designed by the student together with the parent. On the Matching Sheet, the parents specified which activities matched on both checklists, and they had the opportunity to award 'bonus points' to the student if the child had performed well on the tasks. The bonus points could be assigned for the overall manner in which the math assignment was completed, for taking the completed assignment to the parent immediately, and for completing the student checklist and matching sheet. All these points could later be exchanged for a prize from the reinforcement menu. In addition to the reinforcers that could be earned and delivered at home, the students had the opportunity to earn extra points for completing their math assignments and for turning in the checklists.

The results showed a dramatic increase in both homework completion and quality during intervention for most of the students that were involved in the experiment. For twenty out of the twenty-six participants, the percentage of homework assignments *completed* increased with an average improvement of almost 110% over baseline level. The *accuracy* of the homework even improved for twenty-two of the participants with an average increase of 140%.

Parental participation seemed to play an important role in the students' homework performance. The students whose parents implemented the program correctly and consistently showed improvement in both homework completion and quality of homework, whereas the other students did not experience this kind of success.

Even though these studies employ the use of material reinforcers, the reinforcement does not necessarily have to be tangible. Other research has shown that social reinforcement can have a positive effect on academic performance, as well. Brooks, Todd, Tofflemoyer, & Horner (2003) demonstrated the power of social reinforcement with a ten-year old girl that has been diagnosed with Down syndrome and mild mental retardation. They used an ABCAC design to investigate whether a functional relationship exists between self-monitoring with self-recruited reinforcement and an increase in both on-task behavior and assignment completion. The girl's frequent off-task behaviors such as talking to peers or making faces during class time had been identified as a problem that the teachers and researchers sought to modify.

After a baseline had been established, an instruction phase was introduced. Here, the girl was shown how to use self-management skills. She was taught on-task behavior as a noncomparative concept, the operation of a personal cassette player, self-monitoring of on-task behavior, and self-recruitment of teacher attention (since attention had been identified as a reinforcer for the subject). She had to put on her headphones and play a pre-recorded tape that prompted her to record her behavior. She would then either record a "+" or a "0" on a self-

monitoring card, depending on whether or not her behavior had been on task during the specified interval. There were thirty intervals on each side of the tape, based on a variable interval average one-minute schedule. Except for the prompts to record the behavior, the tape was blank.

The self-monitoring card consisted of two columns and four rows. Every sixth cell was filled with a hand icon that prompted the girl to raise her hand in order to receive attention from the teacher. The teacher would then approach her and praise her for being on task, give her a 'thumbs up', a pat on the back, or another positive form of reinforcement. At the end of the period, she would share the results of her recordings with her peers and her teacher, and the number of "+" signs would be counted. After a certain number of "+" had been collected, the girl could exchange them for a special activity with a peer.

After the intervention had been implemented for a total of nine days, it was withdrawn again to establish a functional relationship. It was then reintroduced for another twelve days. During the baseline phases, the girl was engaged in on-task behavior for only 20% of instruction, whereas she was engaged an average of 73% during the intervention. The intervention can therefore be seen as having a positive effect on the rates of academically engaged behavior.

Similarly, Wallace, Cox, & Skinner (2003) conducted a study that showed the power of social reinforcement. However, this study combined two interventions, one of them being social reinforcement, and the other one an alteration of assignment worksheets. The participant of this study was a ten-year-old boy with mild mental retardation who had a history of poor academic performance. This study focused on the number of math problems that the student would complete during independent seatwork. Both the number of problems and the number of problems that had been solved correctly were recorded.

The intervention consisted of two components: The regular worksheets that the students were required to complete during independent seatwork were altered. Instead of the regular 8.5 x 11 inch paper, the researchers divided the paper into six smaller pieces. The participant was given only one of the small worksheets at a time, and was required to recruit reinforcement from the teacher upon completion of the work. The form of reinforcement he would receive consisted of verbal praise as well as a request for 'giving the teacher five.' The student was then given an additional sheet of paper that he was required to fill out. After each worksheet he would receive reinforcement until either all six worksheets had been completed or until the period was over.

In order to establish a causal relationship, the intervention was withdrawn again, and then reintroduced (ABAB design). The results showed that the amount of problems that the student had completed had increased during the intervention without reducing the level of accuracy. However, since this intervention had several components, one cannot conclude for certain which element had lead to the change in behavior.

Interestingly, other researchers have proven that even task completion itself can be perceived as a reinforcing event. This theory is based on the fact that most students have a history of receiving reinforcement for a completed assignment (as described in the previously reviewed studies). Through the process of classical conditioning, task completion itself then becomes a conditioned reinforcing event (McCurdy, Skinner, Grantham, Watson, & Hindman, 2001). McCurdy et al. hypothesize that interspersing easier problems in math assignments leads to a more rapid

task completion, since the students would be reinforced for completing each of those problems. The researchers used an alternating treatment design to investigate this phenomenon. The participant in their study was a nine-year old female regular education student who had been referred to a school psychologist for elevated off-task behaviors (such as talking to her peers or playing with pencils) as well as failing to complete her math assignments.

The researchers investigated if an alteration of assignments would lead to higher rates of on-task behaviors in the participant during independent seatwork. The experimental assignments would be modified by interspersing briefer and easier problems after every third problem in the original worksheet. This resulted in about five additional problems per worksheet. The participant's on-task/off-task behavior during the independent seatwork assignments was recorded through momentary time sampling. These altered worksheets would be given to the participant on even-numbered observation sessions, whereas unaltered control sheets would be used during odd-numbered observation sessions. During three of the sessions, data was collected by two observers in order to ensure reliability. During those three sessions, the interobserver agreement ranged from 94% to 95.6%, showing high levels of reliability.

The results of this study showed that the participant's on-task behavior was about 17% higher when working on the altered worksheets than it was when working on the control worksheets (55% on-task behavior during control assignments compared to 72.25% during experimental assignments). It appears that interspersing additional brief problems could increase on-task behaviors during independent seatwork, thus leading to a higher academic performance.

Summary

All the studies reviewed in this paper have shown the power of reinforcement, whether the rewards are tangible, social, or intrinsic. With the use of reinforcement we encourage the students to perform to the best of their abilities. Yet there are critics who caution that reinforcement has more drawbacks than it has benefits. One of the downsides that skeptical educators see is that students will no longer engage in academic behaviors once the reinforcement is removed (Deci, Koester, & Ryan, 1999). It would be interesting to see how students would react once they do not receive external reinforcement anymore. Since most of the reviewed studies employed a design that did not involve the removal of the reinforcement, it would be interesting to extend the studies and observe the academic behavior of a regular education student in elementary school once reinforcement is withdrawn. Since these concerns are reason enough for some educators not to use reinforcement at all, a withdrawal design that would investigate the validity of these fears seems appealing.

Research Question

Are elementary students in a regular education classroom less likely to engage in academic behaviors once reinforcement is removed? (ABAB design)

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The Effect of Extrinsic Reinforcements on Intrinsic Motivation:
A Literature Review

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The question of whether extrinsic reinforcements diminish intrinsic motivation has been an issue for educators for nearly three decades. Psychologists and researchers from the cognitivist and behaviorist traditions have been at odds regarding that very question since it was raised in the early seventies. The cognitivists, represented by Deci, Koester, and Ryan (1999), maintained that there is a construct known as intrinsic motivation that may be decreased if the wrong reinforcement contingencies are in effect in a specific context. Many behaviorists (e.g., Akin-Little, Eckert, Lovett, & Little, 2004), on the other hand, denounced this hypothesis on three counts. First, the construct of intrinsic motivation is too vague and cannot be operationally defined in any meaningful way, thus making experimentation difficult. Second, in some experiments, the use of rewards is confused with reinforcement. Third, the group design that has been utilized in most studies has been insufficiently constructed to study the impact on individuals and too short in duration to be useful in supporting or denying the claims of cognitivists.

The articles selected for this literature review either support or critique the hypothesis. Two of the articles report single subject research designs. These two studies shall be analyzed and critiqued and will be used as models for future single subject research relating to the question at hand. The need for a single subject design more closely aligned with the constructs and definitions posed by Deci, et al. is needed and a case for such research will be presented here.

What follows is a commentary and analysis on the several articles that frame the current debate regarding whether extrinsic reinforcement has a negative effect on the internal construct known as intrinsic motivation. A synthesis of the issues with the current experimentation on this subject, highlighting and clarifying the process of experimentation and offering a possible single subject design will be presented. Shedding new light on this question is tremendously important for educators. The behaviorist model is pervasive in the American education system and a theory that implies its failures must be studied thoroughly to determine its value to educators.

Definition of Cognitive Evaluation Theory and Elements

Deci, et al. (1999) and Vansteenkiste, Simons, Lens, Deci, and Sheldon (2004), lay the foundation for Cognitive Evaluation Theory (CET). Deci, et al. (1999) is a meta-analysis of one hundred and twenty-eight group studies delineating the key involved when researching CET. In contrast, Vansteenkiste et al. (2004) (of which Deci is a co-author) reviews three CET experiments that look at the influence of context on reinforcement effects.

CET is formally operationalized in terms of the issues which must be addressed if the experiments are going to be a true measure of the CET hypothesis. Deci, et al. (1999) takes exception to many of the critics of the CET hypothesis stating that their experiments frequently lack a thorough understanding and application of the CET theory. Deci, et al. (1999) develop a "typology of reward contingencies" (p. 628) that needs to be understood in order for an experiment to validly assess CET. The typology includes: task-noncontingent (reinforcement given for

something other than the target behavior, i.e. simply participating in the experiment), task-contingent (reinforcement for performing the target behavior), performance-contingent (given for success at the target behavior based on some standard of performance) – with this type further subdivided into two types, completion-contingent and engagement-contingent. Understanding the typology is necessary for researchers who utilize the typology so as to analyze exactly which type of reward contingency is being used and the specific impact on intrinsic motivation.

CEC researchers categorize reinforcement as either tangible or verbal, making a distinction between the two as they admit that "positive [verbal] feedback can have an enhancing effect on intrinsic motivation" (p. 657). Rewards must be anticipated to have the kind of impact that Deci, et al. (1999) hypothesize; meaning that if the reward is not cognitively associated to the rewarded activity (i.e., expected as a result of performing the target behavior), it will not have a significant effect positively or negatively. Also Deci, et al. (1999) have discovered that it is the performance-contingent reinforcements that have the greatest detrimental effect on intrinsic motivation. They hypothesize that it is the circumstance of being reinforced to a lesser degree than others – because the reward in based on the degree to which it is accomplished successfully – in a performance-contingent reward system and that system's implied commentary on one's competency with the target behavior that is responsible for the detrimental effect. Although Deci,et al. (1999) specify the typology, Vansteenkiste, et al., (2004) specify the contexts in which extrinsic reinforcement have a less detrimental effect on intrinsic motivation. "[P]roviding autonomy-supportive learning climates has significant effects for students becoming more fully dedicated and more genuinely engaged in learning activities" (Vansteenkiste, et al., 2004, p. 259). When conducting experiments, experimenters must clarify the specific independent variables (e.g., reward contingency typology and classroom climate) that are being studied. Also experimenters must provide expected tangible rewards to validly assess the CET hypothesis.

It is unfortunate that the experiments that were cited in both of these articles are primarily group designs which tend to mask the variability of individuals in the study. Akin-Little, et al. (2004) discuss the limitations of the group designs. First, Deci, et al. did not operationally define intrinsic motivation. Instead, they define it as being the cause of any "behavior that [is] exhibited when no rewards were observed…In other words when no external reward mechanism is found controlling a particular behavior, the motivation for that behavior is identified as intrinsically controlled" (Deci, et al., 2004, p. 345 -346). This means that Deci, et al. defined it by the absence of something rather than defining the actually phenomenon itself. This means that the dependent variable in any CET experiment, single subject or group, can not be assessed.

Akin-Little, et al. (2004), critique group designs for failing to determine whether a reward is truly reinforcing prior to administering it. Utilizing a reward without determining whether and how each individual views that reward as reinforcing can cause the experiment to be invalid. If there is no significant increase in a behavior, once a reward has been presented, then that reward may not have any value as a reinforcer. This criticism is tremendously important as the CET hypothesis hinges on the detrimental effect of extrinsic reinforcement. If a reward is not legitimately reinforcing, then its effects on behavior may not be functional or at least functional in the manner being investigated.

Akin-Little, et al. (2004) provide a rationale for conducting single-subject designs regarding the CET hypothesis; however they do come to one conclusion that is a bit over-stated. They admit

that few single-subject designs have been conducted, yet they claim, "No study utilizing this methodology has found evidence of detrimental effect of the use of reward" (p. 352). While this may be true as to the results of the single-subject designs conducted regarding CET, the insignificant number of studies must make drawing any conclusion a tenuous proposition at best. A meta-analysis of single subject designs as they relate to the CET hypothesis should include the reward typology, the climate, the type of reward – either verbal or tangible – and whether the reward is expected or not.

Critique of the Single Subject Designs

Two single-subject designs were found for this review and will be critiqued using the aforementioned CET elements. The first single-subject design was conducted by Roane, Fisher, and McDonough (2003). They made the distinction between programmatic and discovery research. The experiment did not have the anticipated results; thus the experimenters had to reassess their methods making it a discovery research project rather than a programmatic experiment. The experiment was intended to assess the detrimental effects of extrinsic rewards on intrinsic motivation (known as the overjustification effect). The subject was a single fourteen- year-old, autistic child with cerebral palsy and mild mental retardation. The setting was a "padded room…that contained chairs, a table, and other stimuli (e.g., toys, work materials) needed for the condition in effect" (p. 37). The dependent variable was a "sorting behavior" whereby the subject placed silverware in the appropriate slot, each space in the "tray was divided into different spaces, each shaped like a particular type of silverware" (p. 38). Through observation by family members and the experimenters, the subject demonstrated this behavior independently; therefore the experimenters concluded that there was some degree of intrinsic motivation to engage in this behavior. A "modified stimulus-choice preference was conducted to identify a hierarchy of preferred stimuli" (p. 38) so as to determine what might be used as a reward for performing the target behavior. This stimulus became the independent variable as reinforcement for participating in the target behavior (sorting). The subject was then allowed to play with the "preferred stimuli" for twenty seconds. An ABA-AB design was used. "All sessions consisted of ten minutes of work time (i.e. the session clock stopped during each 20-s interval in which preferred stimuli were delivered)" (p. 39). During the time that the preferred stimuli were available, the sorting activity was removed from the subject.

The results of the study were contrary to the original premise. During both of the contingent reward phases, the introduction of the preferred stimuli had a detrimental effect on the target behavior. The researchers suggested two explanations for the decrease in the target behavior. The first explanation was that the preferred stimuli acted as punishment for the target behavior rather than reinforcement. The second explanation could be that "preferred stimuli increased the complexity of the task because the participant was visually impaired and had to reorient to the sorting materials after each delivery of the preferred stimuli" (p. 40).

A second study was conducted to determine what might have caused the decreased target behavior. A "time-out analysis" (p. 40) was used in which the same conditions as the reward contingency phase of the original design were used. "[T]his condition was similar to the contingent reward condition of the reward analysis except that the preferred stimuli were not delivered following each sorting response" (p.40). Time to reorient after the sorting box was returned was subtracted from the amount of time devoted to the target behavior to account for the subject's

visual limitations. The subject's response to having either the preferred stimulus available to him or the target behavior was studied. When this contingency was possible, the subject allocated 92% of his time to the target behavior. The experimenters concluded that the sorting behavior was a preferred activity and that the preferred stimuli acted as a punishment when introduced.

While the conclusions may be valid from a behaviorist perspective, that is not the issue being discussed here. From a CET perspective, the fact that the subject was independently involved in the target behavior prior to the experiment makes the case for the behavior being intrinsically motivated. The reward typology may be considered task-contingent, meaning that the subject was rewarded for participating in the target behavior. The climate could be analyzed as controlling in that the target behavior was removed at times and the subject had no control of that removal, meaning that there was nothing that he could do to eliminate the removal of the target behavior during the reward phase. The reward was tangible, but its function as a reinforcer was not fully established prior to introducing it into the experiment. The reward was unexpected – meaning that the subject did not anticipate being reinforced for the behavior – for if it had been an anticipated reward, the experimenters would have known sooner that the reward was not reinforcing for the target behavior. Once these issues have been established a different conclusion can be drawn. In this case, a tangible task-contingent reward proffered in a controlling climate decreased the target behavior. What the experimenters considered punishment actually supports the CET hypothesis: the introduction of the preferred stimuli resulted in the decrease in the target behavior. Once the preferred stimuli were removed baseline levels returned, establishing a functional relationship between the decrease in the target behavior and the "preferred stimuli." However the experimenter, being behaviorists, changed the "rules of the game in the middle of the game" because it did not yield the anticipated results they decided that the preferred stimuli were not a reinforcer, but a punishment. CET would suggest that not only does the introduction of the "preferred stimuli" result in a decrease in "intrinsic motivation" in this case, but that the experimenters, attempting to control the individual's performance based on reward contingencies, made a mistake regarding the power of the stimulus as a reinforcer. As is in evidence here, the introduction of the preferred stimuli directly produced a decrease in the target behavior during the reward phase; this could be considered support for the CET hypothesis that the introduction of an extrinsic reward can have a negative effect on intrinsic motivation.

The second single-subject design dealing with the overjustification effect comes from Akin-Little and Little (2004) who focused on the need to establish that a reward is reinforcing prior to its introduction into the experiment. The study was conducted in a third-grade classroom consisting of seventeen students between the ages of eight and nine "(7 boys and 10 girls). Six of the students were African American and 11 were Caucasian. The participants for this study included two 8 year old Caucasian girls and one 8 year old African American girl. These students were nominated by their teacher who was asked to identify three students who typically follow classroom rules" (p. 182). The dependent variable was the students' compliance with classroom rules, specifically: "(1) Listen and follow directions; (2) Keep hands, feet, and objects to yourself; (3) Work quietly and stay in assigned area; and (4) No name calling, cursing, teasing, or fighting" (p.183). These students were identified as being three of the most compliant children behaving that way in the absence of any noticeable reward. Therefore, the authors assumed that this behavior was an example of intrinsic motivation.

The independent variable was a token economy established for this experiment because "the teacher did not typically reward, with praise or tokens, rule following behavior" (p.182). All students in the class were offered points for "rule following behavior" – students were reminded what that entailed – and then they could exchange those points for prizes. "Points were awarded at three approximately equally spaced time periods during the day (10:30, 12:05, and 2:15) for behavior exhibited in the time period prior to delivery of points" (p.184)   The design was an ABA format in which a baseline phase was followed by a reward phase and, subsequently, the reward phase was withdrawn. Also, a "follow-up phase was conducted after a 3-week interval of no experimenter contact" (p. 184). Each student demonstrated an increase in the percentage of compliant behavior during the reward phase for each of the following behaviors listed previously, thus proving that the token economy and had some reinforcing effect. Also, there was no evidence of a detrimental effect demonstrated once the reward phase was discontinued. Thus it appears that the overjustification effect did not occur.

From a single-subject behaviorist perspective, this was a very sound study. Interobsever agreement for all phases and all "rule following behavior" was between 97%-99% and was conducted for over half the sessions. A video camera was used to assist with interobserver agreement and the camera was established in the classroom three weeks prior to the study being conducted to reduce reactivity. The experimenters established that the rewards were reinforcing as the target behavior increased during the reward phase. The removal of the token economy appears to have had no negative effect on the intrinsic motivation of the rule following behavior for the three subjects as their behavior did not drop below baseline once the token economy was removed. However, a functional relationship between the increase in the target behaviors and the token economy was established as behavior returned to baseline upon the removal of the reinforcement.

While the behaviorist perspective appears to be supported by this study, to assess whether this experiment can be considered as impacting the CET hypothesis, the CET elements must be used. First performance-contingent rewards (that is rewards that are given for meeting a particular standard of behavior) were applied; specifically, it is engagement contingent (that is the subjects are rewarded for engaging in the appropriate activities). Second, the experiment is conducted in a rather controlling environment. As a matter of fact, the experiment focuses on rule compliance thus making the entire experiment about the ability of the teacher, in this case, to control the classroom environment. Third, the rewards were tangible, expected and increased rule-compliant behavior without having any apparent detrimental effect on the intrinsic motivation of the subjects upon the removal of the reinforcement.

Thus it appears that this study contradicts the CET hypothesis. Within a CET perspective, one would expect that the use of a performance-contingent reward system would have a detrimental effect on "intrinsic motivation." In fact, it may be that there was no intrinsic motivation regarding rule compliance prior to the study and thus no way for it to be diminished once the reward phase was removed. The very nature of extrinsic rules for behavior suggests that individuals following the rules are doing so because of some external control, perhaps the avoidance of punishment; therefore the notion that the students were acting on some intrinsic motivation during baseline can be questioned. Once again the lack of an operational definition for intrinsic motivation is at issue here. Another point is that there is no disagreement between the cognitivists and the behaviorists about the ability of reward contingencies to control behavior (Deci, et al., 1999, p. 657). That is exactly what this experiment deals with, control. Finally, the degree of

increase in rule following behavior was relatively insignificant considering how compliant the three subjects were during the baseline phase. Because the researchers were using the subjects' baseline levels for rule following behavior as an indication of intrinsic motivation, there was very little room for the subjects to improve on their performance. From a CET perspective, this study fails to have any bearing on the CET hypothesis because it does not establish that the subjects were intrinsically motivated to perform the target behavior. Thus, any change in the target behavior during any phase can be attributed to the reward contingencies that were in force prior to the study or the token economy up specifically to control the students' behavior during the study.

Conclusion

Though limited in scope, this review of the literature presents the case for more single-subject research regarding the CET hypothesis. To this point, the cognitivists and the behaviorists have been talking past one another. The use of the single-subject method is preferable because it allows for studying the variability of individual subjects, greater specificity, and easier replication. It is also a method that behaviorists support. As long as the CET elements are in place, the two perspectives may be able to begin an honest dialogue. Up to this point, as Strother Martin in the classic movie *Cool Hand Luke* says, "What we have here is a failure to communicate."

What is needed is a single subject withdrawal design that focuses on performance-contingent rewards. Deci, et al. (1999) concluded that performance-contingent rewards have the most detrimental effect on intrinsic motivation. The second aspect that must be attended to in any single-subject design is that it needs to be conducted in an autonomy-supporting environment (Vansteenkiste, et al., 2004) to account for any attenuation in the behavior that may be accounted for by this phenomenon being absent. Furthermore, a concrete and operationally defined explanation of intrinsic motivation is necessary in order to provide a reliable dependent variable.

Research Question

What are the effects of implementing tangible rewards on behavior that has been operationally established as intrinsic, in an environment that is autonomy-supporting? Such a study might provide a starting point for a discussion between cognitivists and behaviorists that may yield far more information regarding the effects of extrinsic reinforcement on intrinsic motivation, if any.

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